

Hidden Genes

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Table of Contents

<i>Acknowledgments</i>	5
<i>Introduction</i>	7
The Church	9
<i>What is the church?</i>	9
<i>There must be a reason</i>	12
<i>Holy or profane</i>	17
<i>Good and evil</i>	21
<i>A social phenomenon</i>	26
<i>Social metaphors</i>	32
<i>The origin of civilization</i>	40
<i>Temples and shrines</i>	44
Hidden Genes	47
<i>The secret of the genes</i>	47
<i>Cultural genes</i>	57
<i>Cultural gene expression</i>	66
<i>Transcription factors</i>	72
<i>Cultural gene translation</i>	75
<i>Behavior Patterns</i>	82
<i>Non-coding DNA</i>	89
<i>Swarm-intelligence</i>	96

Social Organisms	102
<i>Collective Organisms</i>	102
<i>Ideology & Bureaucracy</i>	111
<i>Brain washing & Propaganda</i>	115
<i>Gene Puppets</i>	124
<i>Mind and Body</i>	129
<i>Cultural evolution</i>	138
<i>Sects and speciation</i>	143
Cultural Tumors	149
<i>The end of civilization</i>	149
<i>Cultural tumors</i>	158
<i>Fascism as cancer</i>	163
<i>Types of tumors</i>	171
<i>Creation of tumors</i>	179
<i>Terrorism & Fascism</i>	193
<i>Prevention of tumors</i>	196
Proofs & Consequences	201
<i>Confirmability</i>	201
<i>Agent-Based Models</i>	207
<i>The meaning of life</i>	223
<i>Transcendence</i>	228

Summary	232
<i>Conclusion</i>	232
Appendix	237
<i>Cultural Genes & Pericopes</i>	237
<i>Agent-Based Models Source</i>	241
<i>Image Sources</i>	242
Index	243
Bibliography	246

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The 360 year old state library in Berlin, SBB (Staatsbibliothek Berlin), which has over 25 million books, motivated me to finish the book in June 2020. Thanks SBB! Among the books in the bibliography some were especially important to develop the thesis of this book. The books from the bibliography that stand out are:

- **Richard Dawkins'** classic book about selfish genes (Dawkins, 1976)
- **Randall Collins'** book about sociological insight (Collins, 1992)
- **David Sloan Wilson's** book about religion (Wilson, 2003)
- **Philip Taylor's** book on propaganda (Taylor, 2003)
- **Robert Paxton's** book about fascism (Paxton, 2004)
- **Hannah Arendt's** book about totalitarianism (Arendt, 1951)

They were the first that directed my attention early in the right direction. Isaac Newton said if he has seen further than others then only because he has been standing on the shoulders of giants. These are some of my personal giants that maybe allowed me to see further. This book is an attempt to combine the ideas in these books in the broader context of evolution (Stearns, et al., 2005).

An evolutionary worldview should be applied more broadly, to culture, policies and religion, as David Sloan Wilson continues to say (Wilson, 2019). Many scientists have tried to explain the evolutionary origins of religion, among them

are Robert Boyd and Peter Richerson (Richerson, et al., 2005), John Teehan (Teehan, 2010) and Ara Norenzayan (Norenzayan, 2013). Most pieces of the puzzle have already been found:

- John Teehan designates where the genes are and what their main function as a moral system is (Teehan, 2010)
- Philip Taylor (Taylor, 2003) and Kevin Laland (Laland, 2017) describe how teaching & propaganda express genes with high fidelity
- David Sloan Wilson explains where the phenotype is and how it is subject to selection (Wilson, 2003)
- Ara Norenzayan clarifies how the fibers of the fabric for the phenotype are generated (Norenzayan, 2013)

We just have to put the puzzle pieces together accurately. My hope is that the solution of the puzzle presented in this book offers a slightly new perspective.

I would also like to mention the scientists and science journalists where I always can find inspiration: Brian Hayes, John Baez and Steven Strogatz for Mathematics, Tim Tyler for memetics, Cosma Shalizi and Stephen Wolfram for complex systems, Nigel Gilbert, Robert Axelrod and Eric Bonabeau for Agent-Basel Models, and of course the FRIAM group 😊

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INTRODUCTION

Religions have been a part of our civilization from the very beginning. The big monotheistic world religions are up to 4,000 years old (Armstrong, 1993). After so many millennia, religion today is only a shadow of its former self. Slowly disappearing into insignificance, it is on the verge of extinction in our modern self-centered world. When it makes headlines, it is often associated with terror (Stern, 2003).

Today we live in an enlightened world without white spots on the maps, where unpredictable adventures have been replaced by organized mass tourism and extreme sports. The Wikipedia page for every possible concept or idea is just a click away, and the modern world view is rarely shaken by sensational archaeological discoveries or radical scientific breakthroughs. While social networks where people post selfies gain more members every year, the big churches continue to lose members, and the increasing secularization makes it unlikely that any fundamental insight is hidden here.

You might think everything has been said and every secret has already been uncovered - but surprisingly that is not case. I stumbled upon the things in this book rather accidentally, during my research on complex systems at the University in Kassel, Germany, and in the university libraries in Münster, Kassel, Göttingen and Berlin. I have studied physics in Münster and computer science in Kassel before I moved to Berlin, and I really did not want to study religious systems in the first place.

The subject is inaccessible to science because it deals with personal beliefs and subjective experiences. It is not only inaccessible; it is protected by powerful taboos and blasphemy laws. And yet philosophers like Immanuel Kant (Kant, 1793) and Daniel Dennett (Dennett, 2006) have repeatedly argued that it should be studied as a natural phenomenon. In my opinion they are right, because if religions really contain the secret key to understand society as a whole, then we cannot understand social systems completely if we are not allowed to study them.

This inaccessibility could of course be a reason why the real secret has been hidden for a long time, because nobody dared to look, and even if people tried to look, they only saw what they expected to see (the classic confirmation bias in Psychology). I think people have not seen the secret so far because they have not looked for it or did not want to see it. The biggest secrets often hide in plain sight, behind the most ordinary things we do every day or every week.

This book tries to provide original answers to fundamental problems and insights to age-old questions. As an interdisciplinary book it uncovers new connections between the different sciences, and offers a new understanding of our world. And it tries to investigate what is really going on behind the scenes. It is like learning a new language or solving a set of equations. If you replace the X in the equations by the right parameter, suddenly everything that appeared puzzling and mysterious before makes sense. It is the joy of solving for x (Strogatz, 2012).

We touch the big questions that humans always wanted to know: what is the meaning of life, what does it mean to believe in God, does God exist, and what is the real secret of the church?

Maybe it's a bit of destiny to touch these questions. As a physicist you want to understand how the world works. As a developer you see everything in terms of code. As a German, you are used to do things rigorously, as Martin Luther 500 years ago. If you combine all of it, you arrive naturally at the bold attempt to find the code that explains how the world works.

Warning

Those who fear that their worldview might change should not read the book. You might not see the big religions and the things related to them in the same way after reading the book. But if you want to know what the real secret is, please continue and read on. It is worth it. We examine interesting relationships that have remained in the dark for several thousand years. Come with me on a mesmerizing journey and look behind the curtain.

THE CHURCH

WHAT IS THE CHURCH?

Max Planck said religion and science do not exclude each other, they complement each other. He argues mankind would need science for insights and religions for actions (Planck, 1949). Planck is not wrong here. Religions have always offered clear ethical rules for human actions. They teach us the differences between good and evil behavior, while science offers us the scientific method as the ultimate tool to gain knowledge. Religion is subjective, science is objective. The ultimate goal is of course to bridge the gap between both worlds as Daniel Dennett proposed (Dennett, 2006), to complete the Darwinian revolution (Wilson, 2019). This is what we want to try in this book.

Let us start with the word church. The word church itself has a double meaning: it is used to describe the building where the congregation meets and the organization as a whole that participates in divine services in these buildings. Regular visits in the church, the temple, the mosque or synagogue are required for members of a religious organization. In these places they are supposed to learn what things they have to believe and what rules they have to follow, by participating in regular meetings once a week, by interacting with others of the same group, and by applying this knowledge in real life for the rest of the week. And before people of a religious community were able to read the holy books, this was the only place where they could learn it.

Sociologist Emilie Durkheim defines religion as follows: „A religion is a unified system of beliefs and practices relative to sacred things, that is to say, things set apart and forbidden - beliefs and practices which unite into one single moral community called a Church, all those who adhere to them” (Durkheim, 1915).

Unified systems of belief in God have outlasted centuries, and there are striking similarities between the major world religions. In the Jewish religion

people believe in YHWH (Yahweh or Jehovah), in the Christian religion they believe in God, in the Muslim religion they believe in Allah. The Jews assemble on Saturdays in the synagogue, the Christians on Sundays in the church, and the Muslims on Fridays in the mosques. The priests have different names too: in the synagogue the Rabbi preaches, in the church the Reverend, and for the mosque it is the Imam.

They all share the belief in a single God and have regular divine services where this God is worshipped. All of them meet once a week for a common divine service. They all have at least one holy book: Jews have Torah and Talmud, Christians have the Old Testament and the New Testament (the Bible), and Muslims have Quran and Hadith. The big world religions have much in common. All in all there are more similarities than differences. For all three religions love, charity and forgiveness are central concepts.

For now let us bypass the question if gods exist, because faith rests on the inability to prove the existence. If we can prove the existence, then faith would not be necessary. As long as we consider it a question of faith, it is not relevant to scientific investigations either.

A problem which is much more interesting is if gods take part in the government of the world or not. While not all religions postulate direct control of human affairs by the gods, the question if they intervene in human affairs is essential, as already Cicero noticed two millennia ago:

“As to the question upon which the whole issue of the dispute principally turns, whether the gods are entirely idle and inactive, taking no part at all in the direction and government of the world, or whether on the contrary all things both were created and ordered by them in the beginning and are controlled and kept in motion by them throughout eternity, here there is the greatest disagreement of all. And until this issue is decided, mankind must continue to labor under the profoundest uncertainty, and to be in ignorance about matters of the highest moment” (Cicero, 45 BC)

Cicero argues that the worship of gods only makes sense if they have the power to interfere and to intervene in human affairs:

“There are and have been philosophers who hold that the gods exercise no control over human affairs whatever. But if their opinion is the true one, how can piety, reverence or religion exist? For all these are tributes which it is our duty to render in purity and holiness to the divine powers solely on the assumption that they take notice of them, and that some service has been rendered by the immortal gods to the race of men. But if on the contrary the gods have neither the power nor the will to aid us, if they pay no heed to us at all and take no notice of our actions, if they can exercise no possible influence upon the life of men, what ground have we for rendering any sort of worship, honor or prayer to the immortal gods?” (Cicero, 45 BC)

The problems Cicero describes are not completely resolved today. In philosophy they are related to the concepts of supervenience and downward causation (Kim, 1998). If gods do not exist, why have humans them worshipped for so long? If gods exist, how do they intervene in human affairs? If they intervene, we can study and investigate the interventions. There clearly must be some form of intervention or function in human society, otherwise religions would not have lasted so long.

John Teehan says “religions can be explained as cultural institutions that regulate individual behaviors in a pro-social manner” (Teehan, 2010) and Ara Norenzayan argues that the Abrahamic religions have enabled the cooperation among strangers as long as they belong to the same religion (Norenzayan, 2013). This still does not explain why religions have lasted so long and why they are subject of worship.

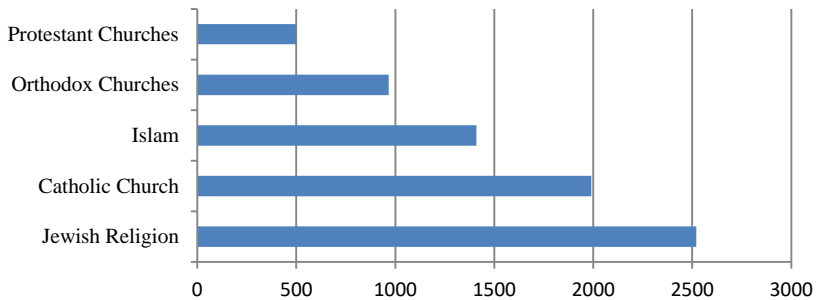
THERE MUST BE A REASON

The real secret of religion is linked to the question of why faith and religion are so convincing that people have believed in them for thousands of years and still keep going to the church, synagogue or mosque. Jews, Christians and Muslims have believed in God for many thousands of years. The holy scriptures from religions have been passed on for millennia from generation to generation. There must be a secret; otherwise the great monotheistic religions would not have survived for so long in almost unchanged form. Rodney Stark and William Bainbridge say it like this: “as one generation has followed another, religion has persisted” (Stark, et al., 1985).

There must be a hidden secret or deeper reason for this persistence, a reason why so many people over so many centuries have placed their religions in the center of their life. What is the secret of their success? The age of the biggest companies at the moment is about 80-100 years, for political parties it is similar. Walmart is 58 years old, Toyota 83 years, and General Motors 112 years. BP was founded 111 years ago, Royal Dutch Shell was created 113 years ago, and VW exists for 83 years. They belong to the biggest corporations at the moment. There are some long-lived companies which are up to 1000 years old, but they are the exception and do not belong to the biggest companies.

The age of religious organizations is far bigger than a century. The Anglican and Protestant Churches are about 500 years old, the Orthodox Church 966 years old and the Catholic Church is 1990 years old. Islam began about 600 years after Christianity. The Jewish religion is even older, about 3000 to 4000 years. The Hebrew calendar starts at 3761 BC, which means the Jewish religion would be 5781 years old. Other sources say Judaism evolved from ancient Israelite religions around 500 BC (Mindell, 2006), which means Judaism would be about 2520 years old. Here we use the latter value.

Age of biggest religious organizations in the West



Why do the three big monotheistic religions still exist after 2000 years, despite all scientific and social progress in the last decades? Already William James noticed more than 100 years ago „There is a notion in the air about us that religion is probably only an anachronism, a case of ‘survival’, an atavistic relapse into a mode of thought which humanity in its more enlightened examples has outgrown; [...] It would seem that she cannot be a mere anachronism and survival, but must exert a permanent function, whether she be with or without intellectual content, and whether, if she have any, it be true or false“ (James, 1902).

As much as Richard Dawkins has opened our eyes and offered us a new understanding of our world in his classic book about the selfish genes (Dawkins, 1976), he is not on the right track if he argues that a supernatural creator almost certainly does not exist and that belief in a personal god qualifies as a persistent false belief or a delusion (Dawkins, 2006). It cannot be a complete delusion because it has existed for such a long time, for thousands of years. There must be a reason for this persistence and longevity, a core of truth.

There must be a secret why they are so long lived and exist longer than any empire we know. The stony structures of temples, synagogues, churches and cathedrals are certainly long-lived. They are long-lived houses of worship

which serve as a permanent gathering place for the community. But the durability of these houses alone cannot be the secret, because the ancient Egyptians, ancient Greeks, ancient Romans, ancient Maya and ancient Aztecs had lots of stony temples too, and they all have ceased to exist long ago. Religions continue to exist even if the former churches and cathedrals are no longer used.

Historical accuracy of the holy text cannot be the reason either. Modern archaeology has made it clear that the Bible is one of the most important artifacts and cultural achievements, but it is not the unquestioned story into which every archaeological find must be fit (Finkelstein, et al., 2001).

What is the secret ingredient that makes these stories so compelling? Is there something irresistible about them that attract people in every generation to it? Sociologist Hans Joas argues “religion is not a kind of primitive and false scientific theory, but a kind of experience” (Joas, 2007).

Already Aristotle knew that the whole is greater than the sum of its parts. Is it the increased trust or protection that makes the difference? Being part of a group increases trust and decreases the chance of being betrayed and misled. The group offers protection and support for the individual. It offers hope. Is hope the secret ingredient? Or trust?

Or is the secret for the longevity of the Christian religion and the Jewish religion on which it is based that they are the cornerstone of our western civilization? They are clearly the foundation on which our laws are built. If something has become the foundation of a building, it cannot easily be removed. One thing is clear: if the secret is not from this world, then religion will remain inexplicable. A recent book about evolution from 2013 still argues that science describes only the “processes that account for the natural world”, and therefore religion is not accessible (Losos, 2013).

Religion remains indeed inexplicable if we do not treat it as a natural phenomenon. We only have a chance to understand the secret if we use the

scientific method and treat religion as a natural phenomenon, as Daniel Dennett proposed (Dennett, 2006) and Immanuel Kant tried to do 200 years earlier (Kant, 1793). This means we should not study the gods that religious groups worship. We have to look at their interventions in these groups, if there are any. In other words we have to investigate how religion and social systems are connected, which includes anthropology, sociology, psychology, and history.

We have to go on a long journey across the sciences and humanities in search of deep laws that unite them. As part of nature, humans are also biological organisms. It is clear that the only unifying principle that includes biology is evolution. We all know that without the concept of evolution nothing makes sense in biology (Stearns, et al., 2005).

It is also clear that culture is just as crucial for understanding human behavior, not just biological genes alone. According to Peter Richerson and Robert Boyd only a Darwinian theory of cultural evolution can explain the unique characteristics of human societies (Richerson, et al., 2005). The social sciences should take what evolutionary biology has to offer and apply it.

In fact many scientists have explored how culture fits into the framework of evolution, among them are biologists like Edward O. Wilson who tried to do discover the genetic base of culture (Wilson, 1998) in order to complete the Darwinian revolution (Wilson, 2019), psychologists like Henry C. Plotkin (Plotkin, 2010) and Alex Mesoudi (Mesoudi, 2011), evolutionary biologists like Kevin N. Laland who tried to explain human behavior from an evolutionary perspective (Laland, et al., 2002) and is in favor of a theory of gene–culture coevolution (Laland, 2017), political scientists like Ronald Inglehart (Inglehart, 2018) or anthropologists like Peter Richerson and Robert Boyd (Richerson, et al., 2005) or William Durham (Durham, 1991).

They all have shown that human culture is itself an evolutionary process that exhibits the key Darwinian mechanisms of variation, competition, and inheritance. And they all agree that there is more than one inheritance system, so that evolution takes place in multiple dimensions (Jablonka, et al., 2006).

Psychologists like Plotkin often try to connect evolutionary biology, psychology, and philosophy but lack sociology and religion (Plotkin, 1997) or they get blocked by the misleading concept of memes which spread like viruses by imitation (Plotkin, 2010).

Anthropologists like Peter Richerson and Robert Boyd tend to focus on cultural replicators that behave like memes which are neither discrete nor replicated faithfully. Richerson and Boyd call them “cultural variants” that are selected not by natural selection but by “biased transmission” (Richerson, et al., 2005). They do not exclude the existence of hidden cultural genes that are discrete and replicated faithfully. They just do not see them, because Anthropology deals mainly with the evolution of tribes and the question how humans have evolved before the first civilization appeared.

So where are the genes of such a theory of cultural evolution for social systems, and how are they expressed? The biggest secrets often hide in plain sight, in very fundamental and foundational elements of society, at the mundane places where we do not look because we know them so well¹ and at the holy places which we do not investigate because we do not want to break taboos or touch holy objects.

At the core of all big monotheistic religions we can find rituals like church services and sermons where the **holy** books are read on **holy** days to increase the **Holy** Spirit. If there is a secret it must be connected to these holy objects. What does holy really mean?

¹ For example the solution for the “hard” problem of consciousness in philosophy, the question of subjective consciousness, can be found in very everyday objects: in Hollywood’s show business, which allows to see the world through the eyes of others in cinema and TV

HOLY OR PROFANE

There is a huge spectrum of religions, but one thing that all religions have in common is the distinction between holy and profane, sacred and secular, divine or common, extraordinary and ordinary. Emile Durkheim, one of the founders of sociology, says

“All known religious beliefs, whether simple or complex, present one common characteristic: they presuppose a classification of all the things, real and ideal, of which men think, into two classes or opposed groups, generally designated by two distinct terms which are translated well enough by the words profane and sacred. This division of the world into two domains, the one containing all that is sacred, the other all that is profane, is the distinctive trait of religious thought” (Durkheim, 1915)

Durkheim argues that these two classes that exclude each other are the defining feature of religions and religious phenomena:

“the real characteristic of religious phenomena is that they always suppose a bipartite division of the whole universe, known and knowable, into two classes which embrace all that exists, but which radically exclude each other” (Durkheim, 1915)

While all religions know the difference between holy and profane objects, every religion considers something different as holy. The holy object is special for each religion and connected to its specific history.

To be holy means something is different, distinct or set apart. In Hebrew holy is named “qadosh” which means “to be set apart for a special purpose”. In Arabic people use qados (also derived from the 3 consonant root Q-D-S) which means holy and “pure”. In Greek “Agios” means holy and “set apart for” and therefore different or distinct.

Durkheim says the thing that is different has to do with prohibitions and interdictions, because holy things are primarily things that are prohibited to change or to touch:

“The sacred thing is par excellence that which the profane should not touch, and cannot touch with impunity [...] Sacred things are those which the interdictions protect and isolate; profane things, those to which these interdictions are applied and which must remain at a distance from the first” (Durkheim, 1915)

These prohibitions can come in different degrees, from holy to most holy (the *sanctum sanctorum*), which is absolutely forbidden. Forbidden things remain inaccessible and therefore mysterious, and it is the mysterious that makes something magic and appealing. Prohibitions are a way to protect important things, and at the same time to make the objects they protect a bit more mysterious.

In religions the things that are forbidden usually belong to God. Everything which belongs to God or is associated with him is holy: the house of God, the word of God, etc. For William James the holy and sacred is that what creates a feeling of “solemn experience” (James, 1902). They are the special and extraordinary things. This means holy things are specific for each religious group, they belong to the group, and because of that they are different from ordinary things and forbidden.

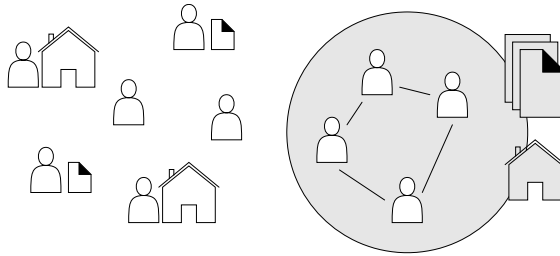
Profane or mundane are the ordinary things we experience every day. Profane things are ordinary things which have no special permissions, which have no prohibitions and can be used at will. They either belong to yourself and you can use them in the way you want, or they belong to someone else and you can use them if you ask for permission. Asking for permission becomes difficult if the things belong to everyone.

Holy or sacred are the extraordinary things which we do not experience every day. Holy things are normally prohibited, because they belong to everyone. They are not allowed to be touched or changed. For examples holy buildings like churches, temples or synagogues, or holy scriptures like the Bible and the Torah. These things are subjects to taboos and prohibitions because they belong to everyone, to the whole religious group.

The Torah for example contains the story of the Jewish people, and belongs to all Jews. The New Testament contains the story of early Christianity, and apparently belongs to all Christians. A holy scripture contains in general the story of the whole community, and it belongs to it. The whole community means here the whole current community and all of its ancestors.

One might argue here that only a small selection of sources and stories were incorporated in the texts when they were codified, so the stories do not represent the story of the whole community. This is true. In the case of Christianity we have in fact many competitors for the inclusion in the early canon of Christian texts, as Elaine Pagels (Pagels, 1979) explains. One can say the sources that survived the selection represent the ancestors for the subset of the religious community today. Daniel Dennett compares this selection to domestication of plants (Dennett, 2006), which is basically the “natural selection” metaphor that Darwin uses in his theory of evolution (Darwin, 2008). Therefore to be precise we have to say a holy scripture contains in general the story of the whole community, but it focuses mainly on the ancestors and founders of the current group, and neglects those competitors that had different views, although they were part of the story as well. Our DNA also contains only the story of our direct ancestors, but not those of the dinosaurs (Dawkins, et al., 2004).

Thus a holy text belongs to the whole current community and all of its ancestors. Likewise the church, the temple or synagogue belongs to the whole current community, because is the house of God where everybody meets. Because it belongs to the whole group, it must not be changed or damaged by one individual alone. Otherwise the whole group and its identity would suffer. Therefore all holy things are subject to blasphemy laws and taboos. It is not allowed to question or criticize them. These interdictions are an abstraction of the prohibition to touch them.



Houses of individual members or texts from individual persons are not holy, because they only belong to a single individual. From a sociological perspective holy things are collective properties which belong to everyone. As the founders of sociology, Emile Durkheim and Max Weber, have noticed early, and as Randall Collins has reminded us (Collins, 1992), the border between holy and profane corresponds fundamentally to the border between the collective and the individual. God is the group, community or congregation. This is a part of the secret we are looking for.

Hans Joas has argued that the holy things are not only important for religious organizations, but also for secular social movements. He mentions the red flag as a holy symbol of the secular socialist movement and says the holy is connected to power, because it has a strong motivating force (Joas, 2017).

For a country the founding elements like the declaration of independence, the constitution, the flag, the anthem and the founding fathers are holy objects, because they belong to the common history of everybody in the country. Likewise in a political party there are principles and symbols like flags and founding fathers that should not be touched by anyone. For the church the book that contains the early history of the organization and the founders are untouchable as well. Holy things are always connected to taboos and interdictions, because holy things are collective property and therefore prohibited and untouchable. Religions are based on opposites: divine and human, holy and profane, good and evil.

GOOD AND EVIL

We want to focus in this book primarily on the big monotheistic religions, i.e. on the Jewish, Islamic and Christian religions which are also called Abrahamic religions. Besides the distinction in holy and profane, the holy scriptures of these religions always have a moral dimension (Armstrong, 2019). They teach us the difference between good and evil, between virtues and vices, what we should do and we should not do, and they promote actions that increase social justice.

What is good and what is evil, and why are all religions defining them and demand that we are good? According to John Locke and his “Essay Concerning Human Understanding” (Locke, 1894) good and evil can be reduced to nothing but pleasure and pain, to a form of reward and punishment. Religions promise to reward good actions and to punish evil ones.

Richard Dawkins argues in (Dawkins, 2006) that evil comes from the faith in god. The religions themselves argue quite the contrary that evil comes from the people that do not believe in god. Who is right and who is wrong, what is good and what is evil?

Philosophers and prophets have tried to answer for centuries the problem of evil. Why is there evil at all and why does it exist? (Meister, et al., 2017). Already the Greek philosophers and the fathers of the church had to recognize that there is no easy answer for it. One of them named Lactantius quotes in his book “A treatise on the anger of god” (De ira dei) the old Greek philosopher Epicurus:

„God, he says, either wishes to take away evils, and is unable; or He is able, and is unwilling; or He is neither willing nor able, or He is both willing and able. If He is willing and is unable, He is feeble, which is not in accordance with the character of God; if He is able and unwilling, He is envious, which is equally at variance with God; if He is neither willing nor able, He is both envious and feeble, and therefore not God; if He is both willing and able,

which alone is suitable to God, from what source then are evils? or why does He not remove them?" (Lactantius, 313)

Aleksandr Solzhenitsyn says in his book "The Gulag Archipelago" about good and evil that there is a "threshold of evildoing" which must not be crossed. The evil comes from violating the law that marks this border or threshold (Solzhenitsyn, 1974):

„Evidently, evildoing also has a threshold magnitude. Yes, a human being hesitates and bobs back and forth between good and evil all his life. He slips, falls back, clambers up, repents, things begin to darken again. But just so long as the threshold of evildoing is not crossed, the possibility of returning remains, and he himself is still within reach of our hope. But when, through the density of evil actions, the result either of their own extreme danger or of the absoluteness of his power, he suddenly crosses that threshold, he has left humanity behind, and without, perhaps, the possibility of return“

And he explains that the line that separates good and evil is not always easy to draw:

„If only it were all so simple! If only there were evil people somewhere insidiously committing evil deeds, and it were necessary only to separate them from the rest of us and destroy them. But the line dividing good and evil cuts through the heart of every human being. And who is willing to destroy a piece of his own heart? During the life of any heart this line keeps changing place; sometimes it is squeezed one way by exuberant evil and sometimes it shifts to allow enough space for good to flourish. One and the same human being is, at various ages, under various circumstances, a totally different human being. At times he is close to being a devil, at times to sainthood. But his name doesn't change, and to that name we ascribe the whole lot, good and evil.“

Today the common understanding is that evil means harmful human behavior and human destructiveness: "evil is to intentionally inflict pain on another

human being, against his or her will, and causing serious and foreseeable harm” (Vetlesen, 2005).

Evilness refers to destructive actions that deliberately harm others (Staub, 2003). Good is understood as the opposite. Ervin Staub says “Goodness is the opposite of evil. It refers to actions that bring benefit to individuals or whole groups: the greater the benefit and the more effort and/or sacrifice it requires, the greater the goodness” (Staub, 2003).

We learn the distinction of good and evil as children from our parents and from the society we live in. They teach us to do good things and to avoid bad things. During our socialization we learn that good deeds should be pursued and criminal actions omitted. We hear what is acceptable and what is not. We learn that we have to follow the social laws of our society, the norms, customs, rules and regulations.

People are bad if they commit crimes and violate laws. In our modern world the judiciary system is the supreme authority to check compliance with the law. In the ancient world this task was done by religion. Religions existed long before the judiciary system. Before the judiciary system existed, kings and priests administered justice. The priests were physicians of the soul and judges of our behavior in the confessional box.

For a society the founders and prophets determine what good and evil is. Religion is the oldest instance that claims to define good and evil. People who break or violate the divine laws are evil; people who obey them are good. A typical divine law is an ethical law that governs the social behavior in a group. For a social group, good and evil are defined relative to a community or group. If people break a law for a social group they are involved in a destructive action that damages the group and its integrity. If they follow the law, they preserve the group and help to construct it.

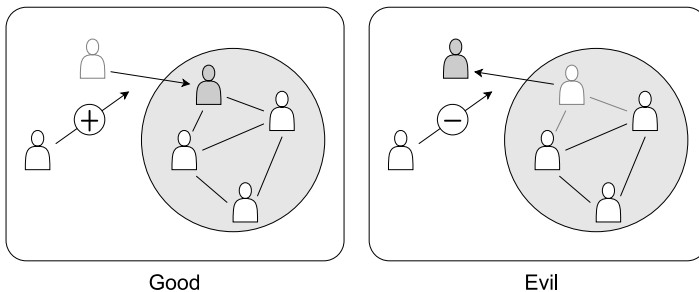
Good is everything that adds new members, supports other members of the group or serves the community as a whole. Selfless behavior, charity, help and

support for others fall in this category, because they are creative, keep the law and help to create the group.

Evil is everything that leads to loss of members, hurts other members of the group or harms the community as a whole. Selfish behavior, hate, grift, theft, lies and murder belong in this category, because they are destructive, break the laws, and help to destroy the group.

Selfless “good” actions are in fact necessary for a larger group. They enable a group to exist in the first place. Love, charity, selflessness and altruism are the glue that keeps a group together. Hate, lies, selfishness and egoism tear a group apart.

Basically, good and evil are always relative, and refer to a reference context. Good means good for something, for the referring object in the particular context. For a person, good is everything that is good for the person. For a group, good is everything that is good for the group. For a political party, good is everything that is good for this party. For society as a whole good is what is good for society. In relation to an object everything that helps, strengthens and benefits this object is good, while everything that hurts, weakens or harms this object is evil. The object can be a single person, but also a group, party, community, or congregation.



From the group's point of view, evil is simply pure selfishness of individuals in form of egoism and selfish narcissism, i.e. the almost pathological love for

oneself. If you break the laws, you hurt the group. It starts with ignoring other people and their needs, and ends with harming others out of selfishness and egoism, for instance by stepping on the feet of others or hurting them physically. In the worst case, it results in a complete lack of compassion and inhuman behavior in form of humiliation and torture or cruelty and crime. A group demands selfless behavior, because it benefits from it. It demands new members because they make it stronger.

Good and evil define pleasure and pain for a certain reference frame. This can be a collective scale, or an individual. For a group losing old members can be painful, while gaining new members which support the group can be pleasurable. For an individual losing strength or a body part is painful, while gaining new strengths or insights is pleasurable. Our selfish genes create the emotions of pleasure and pain to show us what is good and what is bad for us from their perspective. They define what is good and what is bad for the body in the light of the overall goal of survival and reproduction. Evil is if somebody else does a bad thing in this reference frame.

Since all humans are naturally egoistic like all animals, being evil can be simple. You just have to follow your egoistic drives and selfish instances without further ado. Do what makes you feel good without even thinking about others. The German poet Heinrich Heine said that stupidity often goes hand in hand with malice. It is the banality of evil that Hannah Arendt observed during the Adolf Eichmann process (Arendt, 1963).

If God is the selfless group, then the egoistic I is the devil. The famous pact with the devil from Goethe's *Faust* is then a contract with himself, with his future self. Faust bets that the devil Mephisto will not be able to completely free him of his dissatisfaction; otherwise he promises him his soul. When we desire something, we are in fact dissatisfied until we get it.

In a way, desire is a contract between yourself and your future self to be unhappy until you finally get what you want (as the American entrepreneur Raval Navikant put it). You do something for which the future self is grateful.

It is a kind of unspoken contract between the current and future self that both share the joy when they meet. The current self is unhappy so that the future self can be happy.

For example if we want to be a sports star in Tennis, we can selfishly focus on ourselves and train relentlessly until we have reached our goal. In the end we might have become a Tennis star, but only because we have been extremely selfish and because we have sacrificed a part of our soul.

Resisting evil is more difficult, because it requires overcoming self-centeredness and selfishness and sometimes strong moral courage (Staub, 2015). Overcoming evil is not trivial, but it is vital, because evilness is destructive and can lead to genocide, violent conflict, mass violence and terrorism as the 20th century has shown (Staub, 2011).

Just as holy and profane mark the border between individual and collective, good and evil mark the border between acceptable or unacceptable actions in the particular context, between allowed and forbidden behavior. Religion is a fundamentally social phenomenon. What is good for a group is seen as good, what is bad for a group is seen as evil.

A SOCIAL PHENOMENON

The French sociologist Emile Durkheim and the German sociologist Max Weber were the founders of sociology. They knew that religion is a social phenomenon. Emile Durkheim is convinced that religion is not an inexplicable hallucination, but firmly rooted in society:

“Religion ceases to be an inexplicable hallucination and takes a foothold in reality. In fact, we can say that the believer is not deceived when he believes in the existence of a moral power upon which he depends and from which he receives all that is best in himself: this power exists, it is society” (Durkheim, 1915)

And he continues to say that the primary function would be to provide a system of ideas which allows the individuals to understand the society they live in, including their relationship with it:

“Thus religion acquires a meaning and a reasonableness that the most intransigent rationalist cannot misunderstand. Its primary object is not to give men a representation of the physical world; for if that were its essential task, we could not understand how it has been able to survive, for, on this side, it is scarcely more than a fabric of errors. Before all, it is a system of ideas with which the individuals represent to themselves the society of which they are members, and the obscure but intimate relations which they have with it. This is its primary function.” (Durkheim, 1915)

The founders of sociology dealt with religion, while the founders of religions were concerned with social rules. Religion and sociology are closely connected. The German sociologist Gert Pickel says in his book that religions are collective processes that are constitutive elements for societies:

„Religious orientations generally have a high degree of temporal stability and are shared by larger groups of people. They are therefore collective processes in one of their purest forms and often constitutive for societies²“ (Pickel, 2011).

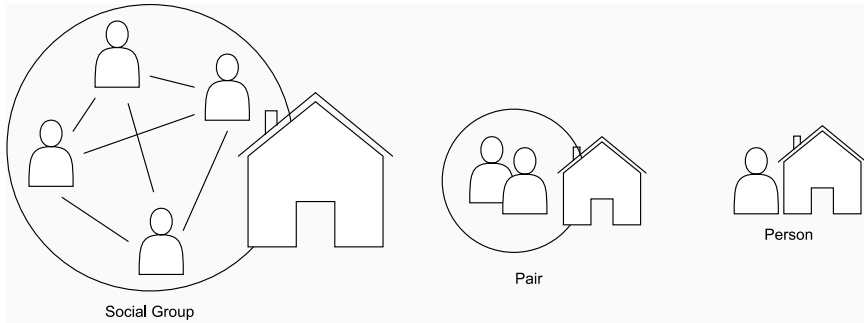
Sociologist Thomas Luckmann asserts that religion can be found where individual actions and moral questions touch (Luckmann, 1967):

“Religion can be found wherever the behavior of the people turns into morally assessable actions, where a self finds itself in a world populated by other beings, with whom, for whom and against whom it acts in a morally assessable manner”

One fundamental function of religion according to Thomas Luckmann is a process of socialization that transforms the members of the human species into

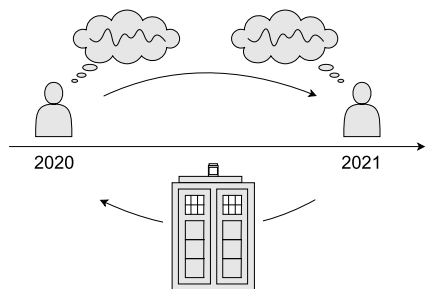
² In the German original: „Religiöse Orientierungen besitzen in der Regel eine hohe zeitliche Stabilität und werden von größeren Personengruppen geteilt. Sie sind mithin kollektive Prozesse in einer ihrer reinsten Formen und oft konstitutiv für Gesellschaften“

morally responsible actors within a social order. A part of this transformation is to teach each member a certain worldview (Luckmann, 1967).



Religion is basically a social phenomenon about group formation. In the beginning you need individuals like prophets, founders or reformers that play an important role in creating it, but once it has been created, it is essentially about the group. Religious groups and religious orders like the Order of Saint Benedict or the Order of Cistercians are always social groups which meet in a large house, a temple, synagogue, mosque, church, cathedral, monastery or abbey. Religion determines how the group interacts and how members should behave in it. Religious laws are moral and ethical rules. In short religion has a social dimension and is about living together in an organized way, in a religious group as a part of a society.

Of course it is also possible to read the scriptures alone and to pray alone. Since most of the rules in the scriptures are social, it would make no sense to learn them if there are no others, though. But even if you pray alone, you are communicating with your future self. Intensive praying always implies communication with your future self. At a later moment



you may remember what you had in mind back then. The memory takes you back like a time machine to your former self and you are able to take the past wishes and thoughts into account. In this sense, if we consider religion only as a natural and social phenomenon (Dennett, 2006), praying can be seen as a way to influence your future self, and that means there are also several people involved here, the current and the future self. The future self and the current self can also be viewed as a community.

Durkheim observed “wherever we observe the religious life, we find that it has a definite group as its foundation” (Durkheim, 1915) and Luckmann argues “Religion requires a religious community, and to live in a religious world requires affiliation with that community” (Luckmann, et al., 1966). In fact religion always takes places in large houses or halls where a whole group can meet: in synagogues, mosques, churches or cathedrals.

As children we are not automatically a member of society. We have to learn it first. We learn religion, culture and language from others and share them with others. Luckmann says “The individual, however, is not born a member of society. He is born with a predisposition towards sociality, and he becomes a member of society” (Luckmann, et al., 1966).

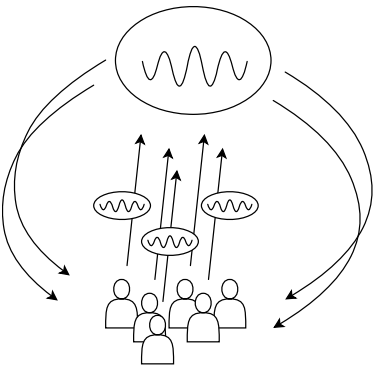
As a social phenomenon we can investigate and examine religion using the scientific method, including the tools from sociology and social psychology. John Teehan says “it is only within the past few decades that we have developed the tools that can give us a fair chance of setting out a scientific account of religious origins” (Teehan, 2010). Therefore Daniel Dennett is right when he claims that we can explore religions as a natural phenomenon (Dennett, 2006), because it is a basically social phenomenon. Immanuel Kant was one of the first philosophers who tried to do that (Kant, 1793).

Religious groups often, but not always have a charitable component. The Jewish, Islamic and Christian religions certainly support the poor and the sick. This is another important social aspect, and it can help in the rise of a new religion during difficult times (Stark, 1996).

The basic elements of religion are shared beliefs (in form of a shared world view) and social rituals. Social rituals are common actions at the same time and shared beliefs are common perceptions. This means the core elements of religions, beliefs and rituals, are based on common cognitive processes shared in a group of individuals. To become a member of religious group and to stay one the individuals must participate in certain rituals. Common rituals are important for the social cohesion of a group and to strengthen the shared world view. During shared rituals certain rules must be observed. The difference to shared activities like play or games is that games are used to explore new rules, while rituals are used to conserve them:

	Ritual	Play
Purpose	Confirm existing rules and strengthen them	Explore new ways, opportunities and strategies
Property	Conservative	Innovative & Creative
Motivation	Duty, Obedience	Fun, Pleasure
Repetition	Regular	Irregular
Effects	Conservation of unity and order	Exploration, discovery of new ways and strategies
Basic rules	Behavior rules	Rules of the Game

James Bielo argues that “religious systems are best thought of as worlds that require construction and constant maintenance” (Bielo, 2015). This maintenance is done in social rituals, which confirm and strengthen existing

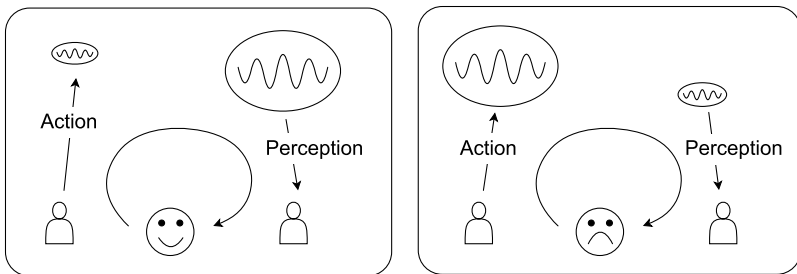


rules and beliefs. We can consider every group meeting as an event where the disintegrating and decaying group is built up again.

According to Bielo, religious rituals are based on common meetings at the same place and at the same time (Bielo, 2015). The same place and time are important to form a single coherent unit out of

separate isolated individuals. It allows synchronous actions and perceptions. This in turn leads to positive feedback illusions among the members.

Systems that synchronize themselves are well understood, from pendulums to fireflies (Strogatz, 2003). The important aspect here is the effect of collective synchronization on the individual member. Each participant acts and contributes only a little, but perceives a strong feedback if the actions are executed synchronously by everybody. The positive feeling in social rituals is achieved by “feedback illusions”. For example in common singing or in a choir, every singer contributes only a little, but perceives a loud overall feedback. This gives the individual participant a good feeling of power and strength.



Collective rituals serve as the connection between individuals and group, they bind groups together. Anthropologist Harvey Whitehouse has proposed two basic modes of religiosity (Whitehouse, 2004): one is an “imagistic” mode of high arousal based on shared rituals which includes common singing and praying, the other is a “doctrinal” mode of low arousal based on sermons and recitations of sacred texts. Rituals are the essential component of the first former. We will discuss the “doctrinal” mode later in detail in the chapter about gene expression.

SOCIAL METAPHORS

From a sociological perspective the Bible is a kind of blueprint to form a Jewish group (the Old Testament) and a Christian group (the New Testament). This does not mean that there is only one possible Jewish or Christian group. Texts that were not included in the Bible or different interpretations lead to different groups, which is the reason why they are often considered as heretic. The texts we know today describe the groups that exist today, and the history of their direct ancestors.

As Elaine Pagels mentions (Pagels, 1979), the New Testament is only a selection of sources and stories of early prototypical Christian groups. In the beginning there was not a single prototypical Christian group. The Gospel of Thomas for example has not been included (Pagels, 2004) and the Gospel of Judas is also missing (Pagels, 2011). This means the New Testament scripture was fluid until its canonization between AD 100 and AD 400, the variety of different books was greater than today.

For Judaism and the Old Testament it is similar. Since the discovery of the Dead Sea Scrolls (Collins, 2013) we know that many texts from the Dead Sea Scrolls were not canonized in the Hebrew Bible, like the Book of Enoch, the Book of Tobit, the Wisdom of Sirach, etc. The Old Testament scripture was fluid until its canonization between 200 BC and AD 200.

Since social groups and especially their abstract names are abstract objects, we need to use metaphors to understand them (Lakoff, et al., 1980). Already the Jewish philosopher Maimonides insisted that many abstract parts in sacred texts are to be interpreted metaphorically (Halbental, 2013).

If we take a look at abstract terms like “House of God“, “Word of God“, “Son of God“ and replace God by X, we get a set of statements like “House of X“. The “experience of God” becomes “experience of X” or “X experience”, as Erich Fromm has called it (Fromm, 1966). These statements are like equations which we can solve by replacing X by “the group”. Then we get “House of the

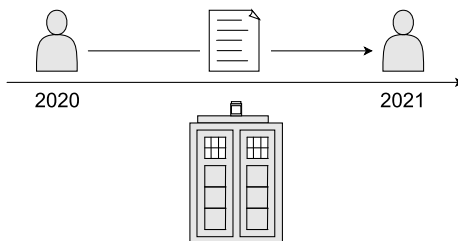
group”, “Word of the group”, “Son of the group” and “the group experience”. Religious groups are basically a social phenomenon:

	Religious Terms	Social Meaning
Deity	God	Group
History	Word of God	Words of the group and history of it
Place	House of God	House of the group : temple, church or cathedral
Realm	Kingdom of God	Realm of the group where the group rules
Follower	Son of God	Founder of the group and exemplary follower
Inclusion	Heaven	(permanent) inclusion in the social group
Exclusion	Hell	(permanent) exclusion from the social group

We can apparently “solve for X” in this way (Strogatz, 2012), because all abstract religious objects gain a concrete social meaning which makes sense. Religious groups can be understood by social metaphors. For example the stories where God is speaking with a prophet describe essentially a situation where numerous people of the group have been talking to the prophet who then develops either some kind of vision how society should look like or a set of concrete rules and laws how society should work.

The holy books contain the “Word of God”, which means they contain the words of the group members and their founders which have been passed down from generation to generation for more than a thousand years. These are Torah and Talmud for the Jewish religion, the Bible for the Christian religion, and the Quran in Islam. There is a reason why these writings are so important to people. The reason is related to the fact that these scriptures and books contain the story of all members of the religious community. They contain the story of the ancestors and founders, and therefore indicate what the members of the group should do - in the form of commandments - and should not do - in the

form of interdictions. As Schaik und Michel have noticed, the bible is a form of diary for early humanity (Schaik, et al., 2016).



What happens when someone writes a diary? By describing the things that have happened, comparing it to the things that should have happened and making appeals to himself, he writes down the desired actions for his future self. We all write down desired actions for our future self for example by writing a note in our calendars. Five minutes later, a day later or even a week or a year later your future self reads the note and feels compelled to do what the note says. Written information is like time travel in a time capsule that contains messages from your former self to your future self. It allows us to speak to our future self. As Carl Sagan said, writing breaks the shackles of time³. This process can be generalized for groups. One of the group members writes down the actions the group should do, for instance by writing down the history of the group. This written information can be used to form the actual and the future type of the group.

From a historical perspective Old Testament and New Testament are a selection of writings over many centuries which describe the history of the current Christian groups and their direct ancestors. Torah and Talmud describe the history of current Jewish groups and their ancestors. In both cases it is not a

³ In this sense the use of language and writing systems allow us to solve the problem of mental causation by the way. By using the external environment, internal intentional thoughts can cause concrete actions.

complete history, but rather a certain slice of history that describes the evolution of one certain set of groups among others. Eric Fromm writes “The Old Testament is the document depicting the evolution of a small, primitive nation, whose spiritual leaders insisted on the existence of one God and on the nonexistence of idols, to a religion with faith in a nameless God” (Fromm, 1966).

When groups split, these holy books can diverge as well. Erich Fromm says “Jewish history did not stop when then twenty-four books of the Old Testament has been codified. It went on and continued in its fuller course the evolution of ideas that had begun in the Hebrew Bible. There were two lines of continuation: one is expressed in the New Testament, the Christian Bible; the other in the Jewish development [...] The latter was also codified: its older part, the Mishnah, around AD 200; its later part, the Gemara, around AD 500” (Fromm, 1966).

In the Jewish religion the Torah was supplemented by the Talmud which consists of Mishnah and Gemara, while in the Christian religion the Old Testament was supplemented by the New Testament. The holy books have diverged.

Just as the Word of God is identical to the words of the group, the House of God is the house where the group meets: the temple, synagogue, church, cathedral or mosque. In such a holy house the holy scripts that contain the history of the group are read regularly. Durkheim writes that the sacred property which belongs to all must be separated from profane things that belong to mere individuals: “the religious life and the profane life cannot coexist in the same place. If the former is to develop, a special spot must be placed at its disposition, from which the second is excluded. Hence comes the founding of temples and sanctuaries: these are the spots awarded to sacred beings and things and serve them as residences” (Émile Durkheim, 1912).

In almost all religions a temple or place of worship is defined as a place where the world of the gods and the world of humans touch. If we consider the gods

as groups, it means that in the temple the world of the group and the world of the individual touch. The individual experiences the feeling of community, and the community lives from the contributions and activities of the individuals. Both depend on each other. Emile Durkheim argued that society cannot exist without members who believe in it, and gods cannot do without their worshippers (Émile Durkheim, 1912):

“On the one hand, the individual gets from society the best part of himself, all that gives him a distinct character and a special place among other beings, his intellectual and moral culture. If we should withdraw from men their language, sciences, arts and moral beliefs, they would drop to the rank of animals. So the characteristic attributes of human nature come from society. But, on the other hand, society exists and lives only in and through individuals. If the idea of society were extinguished in individual minds and the beliefs, traditions and aspirations of the group were no longer felt and shared by the individuals, society would die. We can say of it what we just said of the divinity: it is real only in so far as it has a place in human consciousnesses, and this place is whatever one we may give it.”

And he continues to say that gods and their worshippers depend on each other:

“We now see the real reason why the gods cannot do without their worshippers any more than these can do without their gods; it is because society, of which the gods are only a symbolic expression, cannot do without individuals any more than these can do without society”.

To paraphrase the famous Dobzhansky statement that nothing in biology makes sense except in the light of evolution, we can say that nothing in religion makes sense except in the light of sociology, since sociology considers everything from a social perspective and a sociological context.

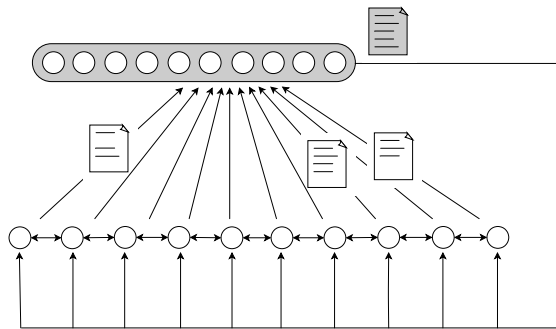
Let us try to summarize how the sociological context grants concrete meanings to abstract religious terms. It all starts with the distinction of holy and profane, as Randall Collins has reminded us (Collins, 1992):

- Holy ⇔ Property of the group
- Profane ⇔ Not property of the group
- Good ⇔ positive for the group (e.g. helping a member)
- Evil ⇔ negative for the group (e.g. harm a member)
- Holy Book ⇔ Story of the group which contains the rules to create it
- Sin ⇔ Breaking the rules of a group, harm the group
- Sinner ⇔ Member who breaks the rules of a group
- Saint ⇔ Role model who keeps the rules of a group
- Prophet ⇔ Founder or reformer of a group who creates the rules
- Priest ⇔ Teacher of a group who teaches the rules
- Mission ⇔ Recruitment of new group members
- Baptism ⇔ Acceptance of new group members

The prophet creates the rules, the priest teaches the rules, and the missionary recruits new members. Holy is everything that belongs to the group, profane is everything else. People who support the group and keep the rules are “good”. People who harm the group are “evil”, because they break the rules. A group member who breaks the rules becomes a sinner. A group member who keeps all the rules in an exemplary way becomes a role model for a perfect member, a saint, and is rewarded by eternal membership in the group, which is basically the meaning of “heaven”: an eternal membership in paradise. Unrepentant, relentless sinners are excluded, expelled, or excommunicated and go straight to hell.

Now we can finally understand Cicero’s problem how gods intervene in human life: they can intervene by their words, if they are recorded in the holy books. The words of the gods in the holy scripts contain the rules that the group members have to follow. By obeying the rules, they let the gods intervene in human life. Since we know now that God means group from a sociological perspective, we can formulate the whole process in social terms as a process of emergence, where a group emerges from a number of loosely coupled individuals.

A group starts to form, held together by common beliefs and interests, for instance as a reaction to some kind of defeat. In the course of time the group itself writes down the text of the group, the “words of the group” so to speak, which is often the history of the group and its founders. The texts of the group contain the rules that the group members have to follow. As time goes on, reformers appear that add new rules and declare old rules as obsolete.



In short the group has invented rules that the individuals in this group are not allowed to break. The group members who follow the rules are rewarded with all the benefits which the group has to offer, while the group members who break the rules are punished by exclusion or expulsion from the group. Sartre said „hell is other people“, but that is mostly true if you look like Sartre and are therefore excluded from good-looking people. In religious terms, hell means simple being excluded from the group that supports you.

Blessings and curses are personal wishes related to the group. A blessing means a good wish that someone will remain in the group, while a curse means a bad wish that someone will be excluded from the group and go to hell. The big monotheistic religions offer people a binary choice: either they obey all the rules, become an obedient member and find the way into heaven where paradise waits for them, or they have to go to hell and are forever excluded from the group.

In modern society the penalties are less draconic. The code of law has superseded the ancient religious rules, and prisons have replaced the concept of eternal damnation and hell. Sins become criminal offenses, and sinners become criminals. The punishment is either a monetary penalty or a prison sentence. In prisons members are excluded from society, but only for a limited time. In religious terms prisons are a kind of purgatory, and the selling of indulgences from the Catholic Church was essentially an ancient form of a monetary penalty.

	Religious Terms	Social Meaning
Inclusive state	Heaven	(permanent) inclusion in the social group
Exclusive state	Hell	(permanent) exclusion from the social group
Inclusive action	Redemption	Being saved from group exclusion
Exclusion action	Damnation	Being expelled from the group
Inclusive intention	Blessing	Wish a person is included in the group
Exclusive intention	Curse	Wish a person is excluded from the group

In ancient societies there was no clear distinction between religious laws, ethical rules and an official code of law from the state. There was no clear distinction between judicial and royal courts either.

There was also no clear distinction between religious books, historic books, statute books and scientific books, or between fiction and non-fiction. The holy books are not just a collection of old stories, they also contain the history of a group, they are a kind of constitution, and they contain a code of law.

Likewise the early temples were not just places of religious worship, they also were administrative, social, political and economic centers, and they had educational function at the origin of civilization.

THE ORIGIN OF CIVILIZATION

During the last 100,000 years humans have invented languages, and based on these languages around 4000 BC writing systems, and finally civilization as we know it. David Sloan Wilson notices in book “This View of Life” that most world histories start at the time when the first writing systems and civilizations appeared: “most world histories begin about 4000 BC in the Middle East, which is suspiciously close to the time and location of the Garden Eden according to biblical accounts” (Wilson, 2019).

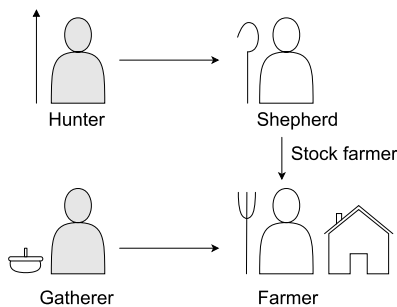
David Sloan Wilson cites the historian Daniel Lord Smail, who argues that in history books as well as in the biblical myths which describe human origins the irrigated fields of Mesopotamia become the Garden of Eden⁴. 4000 BC is seen as the date where human civilization was created. Smail says that “4000 BC marks the boundary between animal society and human society” (Smail, 2007)

4000 BC is in fact the boundary when the Paleolithic man eventually left behind his hunter-gatherer history to become shepherds and farmers. In the Bible the development of civilization is described in the story of Cain and Abel (Kugel, 1998) which is basically a story about how mankind left behind the hunter-gatherer history⁵.

If God is the group from a sociological perspective and religion is fundamentally social, then it makes indeed sense to say that God has created mankind without contradicting modern science. The group of humans has created mankind. Humans have created themselves, and even the date fits.

⁴ The Garden Eden seems to be a translation mistake from Martin Luther, by the way. The German archaeologist Barthel-Fritz Hrouda writes that Eden is a Sumerian word which means desert. The correct translation of the Biblical term would not be “Paradise Eden” but “Paradise in Eden” or “Paradise in the desert”: the garden that arises from the desert by the water of the big rivers in Mesopotamia (Hrouda, 2000).

⁵ Cain the firstborn son of Adam was a farmer, while his brother Abel was a shepherd. The biblical story highlights the conflicts between settled farmers and nomadic shepherds that arose when hunters turned into cattle breeders and gatherers into farmers.



The oldest civilizations are about 4500 years old, as old as the first writing systems and the oldest religions. This is why it makes sense to say that God has created mankind around 4500 years ago. At that time the first writing systems, civilizations and religions appeared. Before that time all human societies were hunter gatherers. Advanced

civilizations arose wherever the environment allowed plant domestication and farming, leading to the generation of surplus and population growth, which in turn led to administration, urbanization, and political centralization (Diamond, 1999).

Agricultural societies needed people who managed the surplus. Early priests had the rights to collect and distribute the surplus, and invented writing systems to keep track of the goods. The formation of the first civilizations was accompanied by the development of writing systems and organized religions. They all appeared together at the same time. In Anthropology religion is seen as a by-product of human evolution (Atran, 2002) and the evolutionary origins are undisputed (Boyer, 2001).

It all started in ancient Egypt and Mesopotamia with the first pyramids and temple towers. These early civilizations also made the first steps towards writing systems by inventing hieroglyphs and cuneiform. The Pyramid Texts from the Old Kingdom of Egypt around 2300 BC are among the earliest religious texts (Shaw, 2000). The ancient Sumerian and Egyptian religions are clearly the early ancestors of the Jewish and Christian religions. If we want to gain insights about these major religions, it is useful to start here. One possible origin of religion is explained in the book of Samuel Noah Kramer about the Sumerians (Kramer, 1963):

“Operating, directing, and supervising this universe, the Sumerian theologian assumed, was a pantheon consisting of a group of living beings, manlike in form but superhuman and immortal, who, though invisible to the mortal eye, guided and controlled the cosmos in accordance with well-laid plans and duly prescribed laws. The great realms of heaven, earth, sea, and air; the major astral bodies, sun, moon, and planets; such atmospheric forces as wind, storm, and tempest; and finally, on earth, such natural entities as river, mountain, and plain, such cultural entities as city and state, dike and ditch, field and farm, and even such implements as the pickax, brick mold, and plow - each was deemed to be under the charge of one or another anthropomorphic, but superhuman, being who guided its activities in accordance with established rules and regulations”

He suggests that the ancient Sumerian theologian did the same as Charles Darwin: just as Darwin assumed there must be a natural selection similar to the manual selection in the breeding of animals, he assumed there must be a natural supervision of nature similar to the manual supervision of fields and farms. Somebody must be responsible for the supervision of the cosmos:

“Behind this axiomatic assumption of the Sumerian theologian lay, no doubt, a logical if perhaps unarticulated inference, since he could hardly have seen any of the human-like beings with his own eyes. Our theologian probably took his cue from human society as he knew it and reasoned from the known to the unknown. He noted that lands and cities, palaces and temples, fields and farms - in short, all imaginable institutions and enterprises - are tended and supervised, guided and controlled by living human beings; without them lands and cities become desolate, temples and palaces crumble, fields and farms turn to desert and wilderness. Surely, therefore, the cosmos and all its manifold phenomena must also be tended and supervised, guided and controlled by living beings in human form. But the cosmos being far larger than the sum total of human habitations, and its organization being far more complex, these living beings must obviously be far stronger and much more effective than ordinary humans. Above all they must be immortal; otherwise the cosmos would turn to

chaos upon their death, and the world would come to an end, alternatives which for obvious reasons did not recommend themselves to the Sumerian metaphysician. It was each of these invisible, anthropomorphic, and at the same time superhuman and immortal beings that the Sumerian designated by his word 'dingir', which we translate by the word 'god'."

During the middle of the third millennium BC, Sumerian society became more urbanized. As a result of this increasing urbanization, Sumerian deities began to lose their original associations with nature and became city patrons. Each Sumerian city-state had its own specific patron deity: Ur had Nanna, the moon god, Uruk had Inanna, the Venus goddess, Eridu was the city of Enki, the god of water, Nippur belonged to Enlil, the god of wind.

In both cultures, the ancient Egyptian and the ancient Sumerian culture, the religion was polytheistic, and most gods had withdrawn from the world, either to be in the unreachable sky or to be invisibly present in the world. Temples were their main means of contact with humanity. They could be used by stargazers to look at the night sky, by priests to make and demand sacrifices, or by priest-kings to assemble the local community. Samuel Noah Kramer says "The temple was the largest, tallest, and most important building in the city [...] the entire city belonged to its main god" (Kramer, 1963).

As Jan Assmann writes there was a close connection between city and local deity: "The kingdom of the Egyptian gods was emphatically 'of this world'. They dwelled in their temples like lords of the manor, owners of the temple estates. In Egypt, most of the land belonged to the temples, and it was worked by the temple personnel themselves, or it was rented out." (Assmann, 2001).

According to Assmann Egyptian temples were the centers of their cities, and the god in a city's main temple was the patron deity for the city and the surrounding region "An Egyptian city was always the city of a deity [...] This was a symmetrical relationship. Just as the concept of city was characterized by the rulership that a deity exercised in and over it, so the concept of a deity was characterized by the city he or she ruled. As unambiguously as the 'city of

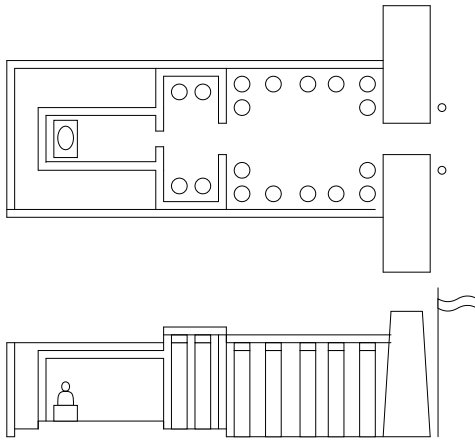
Amun' was Thebes, the 'lord of Thebes' was Amun, the 'lord of Hermopolis' was Thoth, the 'mistress of Dendara' was Hathor, and so forth." (Assmann, 2001).

Ian Shaw confirms that "religious beliefs of the ancient Egyptians were locally diverse and socially stratified. Practically every area of Egypt had its local god, which for its inhabitants was the most important deity" and he argues that "most Egyptians had a strong emotional bond with their native town and its god, the 'city-god', to whom they showed a life-long loyalty" (Shaw, 2000). The emergence of writing systems and the urbanization in the ancient Egyptian, Sumerian and Greek cultures created a new landscape of city-states that offered niches for large religious groups. Modern political parties are defined by policies, ancient religious groups were defined by the cities and villages in which they lived and worked. The city and the surrounding landscape were woven into their senses of cultural identity (Smith, 2003).

TEMPLES AND SHRINES

The early city-states required administration and centralized administration requires taxes. Each of the city-states offered a niche for the emergence of a religious group which worshipped the deity that represented the city, since the local deity demanded sacrifices. Bruce Trigger says "In early civilizations' relation with the supernatural, cult or ritual predominated over other forms of devotion. The central feature of these cults was sacrifice, which has been described, along with prayer, as one of the two 'fundamental acts of worship'" (Trigger, 2003). The center of each religious group where the sacrifices were collected and managed was the temple in the middle of the town. Sacrifices to the gods were the predecessor and precursor of taxes to the state today, just like slaves were the precursor of modern employees.

In front of an ancient Egyptian temple we can find twin-towered pylon gateways and tall flagpoles. Behind the entry there is an open courtyard surrounded by columns. Then we come to an inner hall and finally to the most sacred inner sanctuary and its shrine which contains the statue of the god.



Along the temple's main axis towards the inner shrine the temple becomes more holy and sacred. The innermost chamber is the most holy one and only the priests have access to it, while the open outer courts were available to the public (Wilkinson, 2000).

On festival days, the statue of the god left the temple and was carried on a barque from temple to temple. It was carried from the

sacred inner space through the zones of the ever-larger rooms in the temple and appeared in the profane, public outer world. After the procession in the exterior world it returned to the interior world of the temple (Assmann, 2001).

The Jewish temple in Jerusalem and the successor, the second temple which was destroyed by the Romans, had basically a similar structure. The main difference is that it was only one temple, because it was a small country compared to the kingdom of ancient Egypt. Compared to ancient Egypt, ancient Israel was small and insignificant. They had no monumental pyramids, and only a single temple in Jerusalem⁶, while the Egyptians had at least one big temple in every city. Additionally the Egyptian barque was replaced by the Ark of the Covenant, and the statue of the local god was replaced by the words of the god, inscribed on the stone tablets in the Ark of the Covenant. What does it mean if texts take the place of statues in worship? Texts are more powerful than statues which can be a symbol of abstract properties at best. Unlike

⁶ Actually there were two temples, one for the Kingdom of Israel in the north and the Kingdom of Judah in the south. The northern kingdom of Israel included the city of Samaria, the southern kingdom Judah contained Jerusalem. There was one temple on the Temple Mount in Jerusalem, and one in Samaria on Mount Gerizim which belonged to the Samaritans. The northern kingdom was first conquered by the Assyrians, and then by the Babylonians, until the temple in Samaria was finally destroyed in the 3rd or 2nd century BC (Berlin, 2011)

statues, words can command people to replicate the words, thereby becoming “selfish words”. The members of such religious groups create and replicate a holy book, and the holy book creates them. Both start to co-evolve together.

If the people worship a holy book and obey all the commands and interdictions in it, one can also say that the holy book is governing them. We can learn from ancient cultures and their temples that the most sacred object is the one that rules the group, whether it is a statue that represents the region of the city-state or a holy book that contains an abstract set of laws.

Jared Diamond explores in his book “The world until yesterday - what can we learn from traditional societies?” the basic functions of religion (Diamond, 2012). He mentions explanation, defusing anxiety, providing comfort, standardized organization political obedience, codes of behavior towards strangers, and justifying wars. While they are all valid aspects, the most basic function of religion is to build a religious group itself by demanding obedience, loyalty and sacrifices from the group.

Today the sacrifices have become taxes, the temples have become churches, synagogues, and cathedrals that are mostly empty, but they are still in the centers of our towns and cities and at the core of our civilization. The holy scriptures behind them have built us just as we have created them. As Joseph Henrich writes, the secret of our success as humans lies not in our innate intelligence, but in our collective intelligence - in the ability of human groups to connect socially and to learn from one another over generations (Henrich, 2016).

The last 4000 years can be considered as the Cambrian Explosion of culture. Humans have created a remarkable diversity of temples, churches, religions, institutions, enterprises, corporations and cultures in general. We will take a look at the hidden genes behind this evolutionary process in the next chapter.

HIDDEN GENES

THE SECRET OF THE GENES

In the last chapters we have seen that there must be a secret for the longevity of religious organizations. We know from sociology that they are social phenomena, and that the basic religious terms can be understood as social metaphors.

David Sloan Wilson has shown that religious groups are subject to evolution (Wilson, 2003), and anthropology and history tell us that religion is indeed a by-product of human evolution and has evolutionary origins. Scientists have in fact repeatedly emphasized the importance of group selection and group-level traits in evolution, for example David Sloan Wilson and Elliot Sober (Wilson, et al., 1994), or recently Paul Smaldino (Smaldino, 2014).

All we have to do is to find the genes that create the group-level traits in religious groups. Genes that replicate themselves can be considered as the secret of life. Everything that is alive is based on this mysterious, hidden substance, the DNA which contains the genetic code. The code itself is not an image of a complete organism. It contains the rules to create it.

Philosophers like Aristotle, Plato, Descartes and Kant, the founders of sociology like Max Weber and Emile Durkheim and the founders of psychology like Wilhelm Wundt and William James, and even the founder of the modern theory of evolution, Charles Darwin himself, they all knew neither DNA nor genes. DNA was discovered in 1953 by Francis Crick und James Watson. This means that all scientists and philosophers that lived before were not aware of the existence of genes and genetic code.

Unlike them, we know since Watson and Crick that genes exist and that they have enormous importance. In fact biology was forged into a coherent science only within the last decades after the discovery of DNA, when a largely unified evolutionary theory emerged (Mayr, et al., 1998).

This means we have a huge knowledge advantage compared to the founders of philosophy, psychology, sociology and social science, who lived in an age before the discovery of DNA. We can transfer this knowledge from molecular biology to social science. Let us try to do this then. As Peter Medawar wrote “The attempt to discover and promulgate the truth is [...] an obligation upon all scientists, one that must be persevered in no matter what the rebuffs - for otherwise what is the point in being a scientist?” (Medawar, et al., 1983).

Do we have blueprints for the social fabric of society that have the ability to evolve? The social fabric of society can be considered as the complex mesh of interactions between the members. Frequent interactions result in a strongly coupled, dense fabric. Sparse interactions lead to a weakly coupled, light fabric. As we know from sociology, the interaction between the members of a society is regulated by customs, norms and laws, and especially in ancient societies, by religious rules. The ethical rules from religions traditionally regulate the interactions between the members. Their rules and laws prohibit certain interactions, and encourage others. If there are any genes in society, they should be located here, in the rules and laws that form a society. They do not have to be universal. Different societies can have different genes.

As we know since Richard Dawkins, genes can be seen as egoistic units that create vehicles to lever themselves into the next generation (Dawkins, 1976). This means we only have to look for objects that remained mostly unchanged for centuries. The things that have remained mostly unchanged for centuries are the holy books that contain the story of the group or their founders. Since their canonization, they have remained the same although the big monotheistic religions have existed thousands of years. The interpretation has been revised, extended and edited, but the text itself is the same as the one from thousand years ago. The discovery of the Dead Sea Scrolls (Collins, 2013) demonstrated the unusual accuracy in the replication of the texts in the Hebrew Bible, which indicates that the texts from the Old Testament we know today are reliable copies of the original works.

The holy books themselves are as the name says holy and therefore untouchable for ordinary people. They are considered as unchangeable because they are connected to the identity and the character of the group. They define and construct the social fabric. Holy texts and moral norms are not completely unchangeable, but they are stable and resistant to change. It is not the case that they cannot be changed at all, as the large number of variants, reformations and denominations shows. Reformers, prophets and heretics can change the holy texts. Such reformations are rarely without heavy opposition of the existing group, though, as the bloody history of the Middle Ages shows, where the Protestant churches split from the Catholic church which triggered the Thirty Years' War. This heavy resistance indicates that reformers and prophets touch something very fundamental if they change the holy texts, something which is absolutely essential for the existence of the group.

If there are genes for religious group we can find them here. How do these cultural genes look like? Richard Dawkins coined the name “meme” in analogy to the word gene. He says about memes in chapter 11 of his book: “Examples of memes are tunes, ideas, catch-phrases, clothes fashions, ways of making pots or of building arches. Just as genes propagate themselves in the gene pool by leaping from body to body via sperms or eggs, so memes propagate themselves in the meme pool by leaping from brain to brain via a process which, in the broad sense, can be called imitation” (Dawkins, 1976).

In my opinion this “meme” name is a bit misleading, because he defines a meme as a unit of cultural information that spreads by imitation, in the same way in which a virus spreads. Genes are by definition expressed regularly and should create an organism. Dawkins' memes are not able to do that, since they spread like viruses. Maybe this misleading concept of viral memes is one reason why memes have not been successful so far as an explanatory model for culture (Aunger, 2000).

Edward O. Wilson tried to define a meme as the smallest unit of culture (Wilson, 1998), as a node of semantic memory. This also goes in the wrong direction. Susan Blackmore describes religions as “memplexes”, which are

defined as memes that are replicated together. She argues that the members of a religion are infected by religious memes (Blackmore, 1999). In a sense this is correct, but she still uses the image of a virus that infects their hosts. If we want to describe social systems as an evolution system, we have to identify genes. Genes are far better than viruses for this purpose, because genes can replicate themselves, while viruses are an infectious agent that relies on hosts to replicate.

All of them, Richard Dawkins, Edward O. Wilson and Susan Blackmore look into the right direction, but they do not recognize the real core of religions. The evolutionary view of cultural phenomena from Dawkins, Dennett, Wilson and Blackmore is absolutely correct, but they all do not see the real secret, for whatever reason. Richard Dawkins fights religion (Dawkins, 2006), which is a bit ironic, because on the one hand evolution can help to explain religion, and on the other hand his greatest bestseller is named “Selfish Genes”, which is a metaphor not unlike religious metaphors such as “word of god” or the “house of god”. All of these metaphors are used to explain and understand the world (Lakoff, et al., 1980).

Henry Plotkin (Plotkin, 2010), William Durham (Durham, 1991) and Kevin Laland (Laland, 2017) also belong to those that have tried to create an evolutionary theory of social systems. There is always one scientific field missing: for a complete theory we have to connect all fields, evolutionary biology, anthropology, psychology, philosophy, sociology, religion and history. Often one subject is missing.

And one important point is always missing, the identification of the cultural genes and the mechanism how they are transcribed and expressed. Scientists only examine the biological genes and their influence on culture, or they focus on viral memes and cultural variants. The name “Coevolution” from Durham’s book indicates that there are in fact multiple levels of evolution. The point is: different levels can also have different genes. Evolution can happen in multiple dimensions (Jablonka, et al., 2006).

The essential point is to notice that there are indeed cultural genes that are expressed in just the way that biological genes are read. We have cultural genes as well, not only viruses, especially in the ancient religious organizations. They are genes which are transcribed and expressed like biological genes as we will see in the next chapters.

Therefore the concept of Dawkins' viral "meme" is misleading for two reasons: the replicators for group-level traits are genes, not viruses, and the process by which they act is expression, not imitation or mimesis. Expression means preaching, teaching and learning. The "meme" concept does not consider that culture can be taught. Richerson and Boyd say social transmission of behavior is common in human societies (Richerson, et al., 2005), but the most common form of transmission is clearly teaching and preaching, not imitation, since each of us spends nearly 20 years in schools and universities. Teaching is just as important as imitation.

Boyd and Richerson identify culture as a socially transmitted heritage and say that "culture is information capable of affecting individuals' phenotypes which they acquire from other conspecifics by teaching or imitation" (Boyd, et al., 1988). Kevin Laland goes a step further and says that high-fidelity information transmission which is ignored by Richerson and Boyd has been achieved by teaching which is rare in nature but universal in human societies (Laland, 2017).

This means that we have to look at places where groups learn new rules. There is only one place where religious groups are supposed to learn new rules: it is the church, synagogue or mosque. The rules that are taught here are contained in the holy books of the religious group.

If religious groups are coherent and collective organisms that are subject to evolution, as David Sloan Wilson has recognized correctly (Wilson, 2003), then the holy books are the only place where the genes can hide, because they contain the rules that the group is taught. David Sloan Wilson and his colleague from Binghamton University, Eric Dietrich, argue that Religion is an

evolutionary adaptation of the human mind that offers a group binding mechanism, gives us a sense of community and a moral guide (Dietrich, 2015).

To my knowledge nobody except David Sloan Wilson and his coworkers has noticed and described it correctly. And yet the genes are there, and everybody knows them. They are so familiar that they have become uninteresting. They are in fact the core of the holy books: the set of rules, laws and commandments that control the behavior of the members. The religious laws, rules and commandments are a code which controls the creation of a religious group. Code comes from Latin “codex” which means “book or system of laws”. This code generates a religious group, and the religious group in turn creates just like a biological organism a copy of its genes in order to replicate them.

Religious texts themselves are the code which corresponds to social and cultural DNA. They contain cultural genes which are simple rules that control the behavior of a social group. We all know these ethical and moral rules well: for example the classic Ten Commandments of the Jewish and Christian religion. The Ten Commandments are not only commandments, they are in fact genes. These genes are the real counterpart of biological genes.

And this is the perplexing insight: the commands and interdictions which all members have to obey are nothing else but genes that create a coherent unit out of a collective of individuals. Genes are responsible for the creation of their own systems that help them to replicate themselves, unlike viruses, which only use existing system for the own replication.

How can we define a cultural gene? Culture is like personality a broad umbrella term. Max Weber says “Culture is a finite segment of the meaningless infinity of the world process, a segment on which human beings confer meaning and significance” (Finch, 2011). Culture is everything which humans do and apes don’t, in other words those things that distinguish us from apes: language, writing systems, music, sports, and art. Culture is defined as the ideas, customs, and types of social behavior in a social system or a particular

group of people. The ideas, customs and behaviors can usually be described by a set of rules and characters.

This means the core of culture is a set of rules that create and control a social system. Cultural genes are individual rules that are used to influence the behavior patterns of the group. Customs, rules, norms, and laws all have the same social purpose: they are directives to direct our behavior.

Therefore the following definition makes sense, if we define genetic code as code that contains instructions to create and control organisms in general:

- A **biological gene** contains an elementary rule for the creation of a protein or enzyme in a biological system. It implements the genetic code for biological organisms and contains instructions to create and control them.
- A **protein** is a building block of a biological system.
- A **cultural gene** contains an elementary rule for the creation of a “behavior pattern“. It contains instructions to create and control social entities that perpetuate themselves.
- A **behavior pattern** is a building block of a social system. It is a concrete rule for the behavior in a certain situation. It can be a belief, desire or intention, or simply an opinion.

Biological genes are too small to see, but we know their importance. For cultural genes it is the other way round: cultural genes are well known, but we are not aware their real importance. A cultural gene is for example the central rule “You should not kill” or the commandment “You shall not lie”. Every social and religious group has its own set of genes.

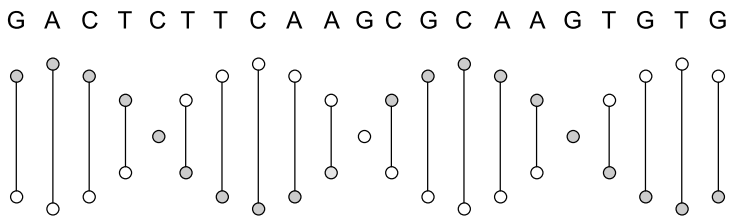
The secret of these cultural genes is that they control the creation of a social group. As we have seen in the first chapters, religion is a fundamentally social phenomenon, and the basic rules of most religions are social by nature. And we can find them indeed in the holy books and sacred texts: the genes that generate the fabric of society can be identified as the basic commandments and

fundamental laws, the commands and interdictions, the central rules and prohibitions. We can call them “cultural genes”.

The first difference to biological genes is the scale: we can see the organisms from biological genes, but the genes themselves are too small to see them. For cultural genes it is the opposite: we can see them, but the organisms are too large to comprehend them directly. The second difference is the substance: genetic code is stored in the DNA molecules. The code of cultural genes can be stored in any language in scrolls, scriptures or simply in normal books.

Both can be considered as the same kind of gene because they share the central concept of packaged information. In principle it is not important if information is stored in a double helix, on a hard disk or in printed books. The evolutionary biologist George C. Williams has defined a gene as package of information: “The gene is a package of information, not an object. The pattern of base pairs in a DNA molecule specifies the gene. But the DNA molecule is the medium, it's not the message” (Williams, 1992).

If we define a gene as a package of information, then we have a lot more options to realize genes and genetic organisms. We are used to consider biological DNA as the only form of DNA, as the only medium for genes. Organic molecules are a very efficient way to store information, but they are certainly others. Molecules are only the storage of inherited genetic information, just like the characters in normal manuscripts and books store the information of words and texts.



DNA uses a four letter code where a triplet of three bases encodes exactly one amino acid. These amino acids in turn are used to create a protein. Genetic information in general can be stored in any language, in the language of the DNA using the four Nucleobases A, G, C, and T, in binary language which uses 0 and 1, or in Greek, Latin and English. A gene contains essentially a recipe to create something. This can be a protein, but it does not have to be a protein. It can also be a behavior pattern. Together the genes in the genotype are able to create a phenotype, an organism which has certain observable characteristics and traits.

GACTCTTCAAGCGCAAGAGCGCCCAATACGCAA
ACCGCCTCTCCCCGCGGTTGGCCGATTCATTA
ATGCAGCTGGCAGCAGGTTTCCCGACTGGAA
AGCGGGCAGTGAGCGCAACGAATTAATGTGAG
TTAGCTCACTCATTAGGCACCCAGGCTTACA
CTTTATGCTTCCGGCTCGTATGTTGTGTGGAAT
TGTGAGCGGATAACAATTTACACAGGAAACAG
ATGCAGCTGGCAGCAGGTTTCCCGACTGGAA

...36 "Teacher, which commandment in the law is the greatest?" 37 He said to him, "**You shall love the Lord your God with all your heart, and with all your soul, and with all your mind.**" 38 This is the greatest and first commandment. 39 And a second is like it: **'You shall love your neighbor as yourself.'** 40 On these two...

...36 διδάσκαλε ποια εντολη μεγαλη εν τω νομω 37 ο δε ιησους ειπεν αυτω **αγαπησεις κυριον τον θεον σου εν ολη τη καρδια σου και εν ολη τη ψυχη σου και εν ολη τη διανοια σου** 38 αυτη εστιν πρωτη και μεγαλη εντολη 39 δευτερα δε ομοια **αυτη αγαπησεις τον πλησιον σου ως σεαυτον** 40 εν ταυταις ταις...

...36 magister quod est mandatum magnum in lege 37 ait illi Iesus **diliges Dominum Deum tuum ex toto corde tuo et in tota anima tua et in tota mente tua** 38 hoc est maximum et primum mandatum 39 secundum autem simile est huic **diliges proximum tuum sicut te ipsum** 40 in his duobus ...

Genetic information can not only be stored in multiple ways, it can also be used to describe diverse systems, including social, ideological, political, or economic systems. Here lies the secret: just as there are more than biological systems, there are more than biological genes. There are genes behind political parties and ideologies. There are genes behind organizations, movements and societies. And there are genes behind the church and the big monotheistic religions. The general opinion says that these genes do not exist. Yuval Harari for example claims that Religions like the Jewish religion, Christianity or Islam do not have a fixed, unchanged DNA. They all would simply be what people make of it. All religions would be based on fairy tales, stories and lies (Harari, 2018).

The central thesis of this book is: there is a social DNA, and there are other genes besides the normal biological genes, which work in nearly the same way, only on the macroscopic level of social systems, not on the molecular level of biology. This is a new approach. A number of scientists have tried to describe culture as an evolutionary process, among them Robert Boyd (Boyd, et al., 1988) and Luigi Luca Cavalli-Sforza (Cavalli-Sforza, et al., 1981), but to my knowledge nobody except David Sloan Wilson (Wilson, 2003) has tried to find or to identify these genes in religion itself.

Genes in holy texts can control the behavior of a group in just the same way as the genes control and influence the behavior in cells. The difference is the level where they are active: biological genes encode proteins and enzymes, cultural genes encode behavior patterns. We perceive biological organisms and their genes from the outside. We perceive cultural organisms and their genes from the inside. This means each book in the Bible is comparable to a chromosome: a connected, unified structure which contains genetic information in the form of genes.

These books have to use the same genetic code, i.e. they have to be in the same language, but they do not have to be absolutely coherent, they can contradict each other, and even within a book we can find contradictions. Contradicting elements create more space for interpretations and they leave more room for different understandings. Let us have a look how these chromosomes look like in the next chapter.

CULTURAL GENES

A holy book does not have to be old. The “Book of Mormon” from the Mormons is from 1830, and a “cultural genome” does not have to be a holy book or sacred religious manuscript. It can be a manifest that defines a certain direction of art, or a party program that describes a certain ideology.

Examples for gene sets are the communistic manifesto from Karl Marx and Friedrich Engels, which can be considered as the holy book of communism. It contains like the Bible 10 rules, called “measures”, which read like a party program. Mao’s “Little Red Book” was considered as the Bible of communism in communistic China. Even if it is a mere collection of sayings and quotes, it helped unifying the people of China. Art directions like surrealism or Dadaism can have their own manifesto too (Danchev, 2011).

In general it is the whole collection of behavioral patterns, rules and norms that are valid for a certain organization, organizational form or social group:

- **Holy Book:** A holy book contains the story of a group and the blueprint for the creation of such a group. It can contain contradictions, which increase the freedom for interpretations.
- **Manifest:** A manifest is a set of instruction for the manifestation of a certain organizational form, for instance a direction of art or an ideology
- **Program:** A party program is a set of ideas, demands, and goals for a political party in order to appeal to the general public. Even if the party program contains empty promises and contradictions, it can be useful propaganda to build a party and to gain votes.
- **Codex:** A codex is a collection of recognized standards, practices, guidelines, rules and other recommendations for a certain organization

In this book we focus first of all on the holy books and their genes. The most important and oldest genes which the Jewish and Christian religions share are the famous Ten Commandments. We all know them well. According to the Bible, the prophet Moses has obtained them from God himself on Mount Sinai.

If God is the group, i.e. the people of Israel, then this means that the people have given themselves laws. This sounds realistic.

A good cultural gene must be able to intervene in the life of the group members and guide their actions. One of the first who developed this idea was George Santayana. In his book “Interpretations of Poetry and Religion” he describes the idea that “poetry is called religion when it intervenes in life, and religion, when it merely supervenes upon life, is seen to be nothing but poetry.” (Santayana, 1990).

William James was fascinated by Santayana's book and considered it fantastic philosophy. He wrote in a letter that “the great event in my life recently has been the reading of Santayana's book” (Perry, 1935).

A gene must be able to influence the behavior of a group. To be successful, it needs to be accompanied by genes for growth. To be long-lasting, an organism must obtain a steady source of building blocks. We know that water and light are essential for plants, while fat, sugar and water are essential substances for animals. Just as these substances are essential, because they are the building blocks of any biological organism and provide fuel for the cells, we also have essential raw material for systems created by cultural genes. New members are essential for social systems, because they are the building blocks, and individual members are short-lived.

A good set of cultural genes therefore has at least one gene which has a strong “missionary” aspect and is responsible to **gain new members**. If there are enough members, social cohesion and a sense of identity are important factors too. Love and charity are valuable for religions, because they increase the cohesion of the social group.

Each set of genes defines a spectrum of good and evil. From the perspective of the genes, good is what benefits the organism, evil is what damages it. For biological genes, everything that damages the organism is evil. For cultural

genes everything that damages the integrity of the group is evil. Selfish genes are the root of evil so to speak (Dawkins, 1976).

What makes a good gene? A good gene is compact and has a great effect. It contains like an aphorism distilled behavior patterns of the past that have been useful for generations. Aphorisms contain the wisdom of a whole book in a single sentence, as the German poet Theodor Fontane once said. In this sense one could say good genes contain the essence of long gene sequences in a compact and compressed form, because they mirror knowledge from past times.

Good cultural genes to create groups are a **compromise** between the desires of the individual and those of the group. The Ten Commandments for instance are such a compromise between the needs of the individual and the needs of the group. The “Do not steal” commandment for example says you can have everything (to satisfy your needs) as long as you acquire it legally and do not take it away from someone else (to satisfy the needs of others), because theft takes away property and therefore destroys it. The “Do not lie” commandment states similarly you can say everything you want (to satisfy your communication needs) as long as you do not break the truth (to satisfy the needs of others), because lies mislead others and destroy trust. These two basic commandments guard property and trust, and make it possible to live together in larger groups.

These genes regulate first of all the behavior in the group. They are not necessarily valid for the behavior towards members of other groups, especially if they are viewed as hostile. The “Do not kill” commandment conserves life inside the group, but might be suppressed for actions towards “enemies of the group”, because these actions can protect the own group.

How many genes are there, and how many do you need to build a social organism? Since the cultural genes in religious organizations correspond to the central laws of the group, we simply have to count the laws and commandments. In the Jewish religion we have the basic 10 commandments,

although an Ultra-Orthodox Jew has to obey much more laws, including Kosher dietary laws and many more rules and regulations. In Christianity we have in addition to the 10 commandments the Great Commandment, the Golden Rule, the laws from the Sermon on the Mount and the Sermon on the Plain, etc. Together these laws contain the guidelines for behavior, while the surrounding non-coding parts help to create the right context and a sense of identity.

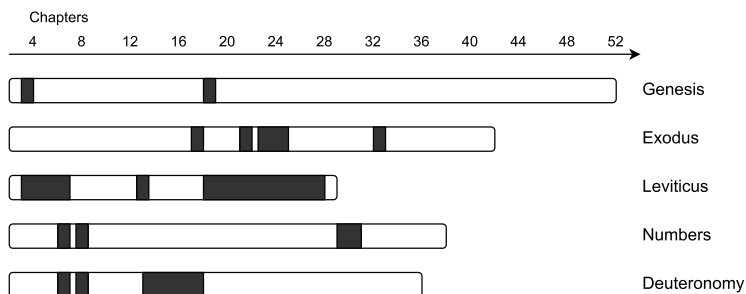
The overall number of instructions can be large, but the number of central genes and fundamental commandments is often small. There are only 10 commandments for the Jewish and the Christian religion. Fundamental commandments concern basic social attributes like life, property or trust, which are universal attributes of all societies. Good cultural genes are universal and lead to long-lasting organisms.

For the Christian religion we have also a few fundamental rules like the golden rule and the rule of charity, missionary genes which control the growth, and many more minor rules which are listed in the Appendix. There are in fact countless minor instructions and regulations. Jews know about 613 concrete instructions from the Torah, 248 commands and 365 bans, and of course the 10 commandments themselves.

The most laws can be found in Leviticus, Deuteronomy and Exodus. The 10 commandments themselves occur twice, in Exodus and Deuteronomy. This is the same gene duplication we can observe in biological systems where they are common (Alberts, et al., 2014). We also have the Sabbath law and the Covenant Code (Exodus), dietary and sacrificial laws (Leviticus), the Deuteronomic Code and the Great Commandment (Deuteronomy).

In eukaryotic biological cells DNA is packaged into a set of chromosomes (Alberts, et al., 2014). The chromosomes for the Jewish religion are simply the books from the Torah - the 5 books of Moses Genesis, Exodus, Leviticus, Numbers and Deuteronomy. If we color the places where we find the basic

genes, we get the following picture of the most fundamental genes for the Jewish religion and their location inside the non-coding gene sequence:



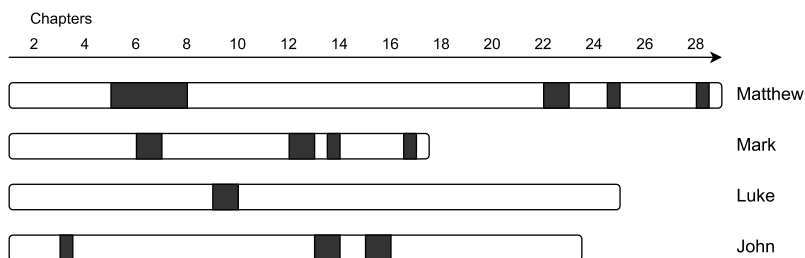
This is of course a simplified picture where we leave out all smaller books of the Hebrew Bible, which contains 24 books in total, including various prophets, the Chronicles and the psalms. We also do not consider the Talmud here, because it contains mainly interpretations of the Torah (see next chapter).

In the Christian religion we have slightly less rules and commands than in the Jewish religion. The new commandments are more abstract and less focused on food, nutrition and hygiene. The genes for dietary laws and sacrificial laws are suppressed, since many of the old rules in this area have become irrelevant (Schaik, et al., 2016).

The two laws of the Great Commandment (the Great Commandment of the Old Testament and the charity law to love your neighbor) have gained importance and can be found in all 4 gospels. This is again a case of gene duplication. The 4 or 5 rules from the Sermon on the Plain and the Sermon of the Mount (among them the laws to “Give more than is demanded” and to “Love your enemies”, the Beatitudes “Be merciful”, “Be peaceful”, the Golden Rule “Treat others the way you want to be treated”, the law to prohibit judgement) are together with the law of charity the new 10 commandments of Christianity.

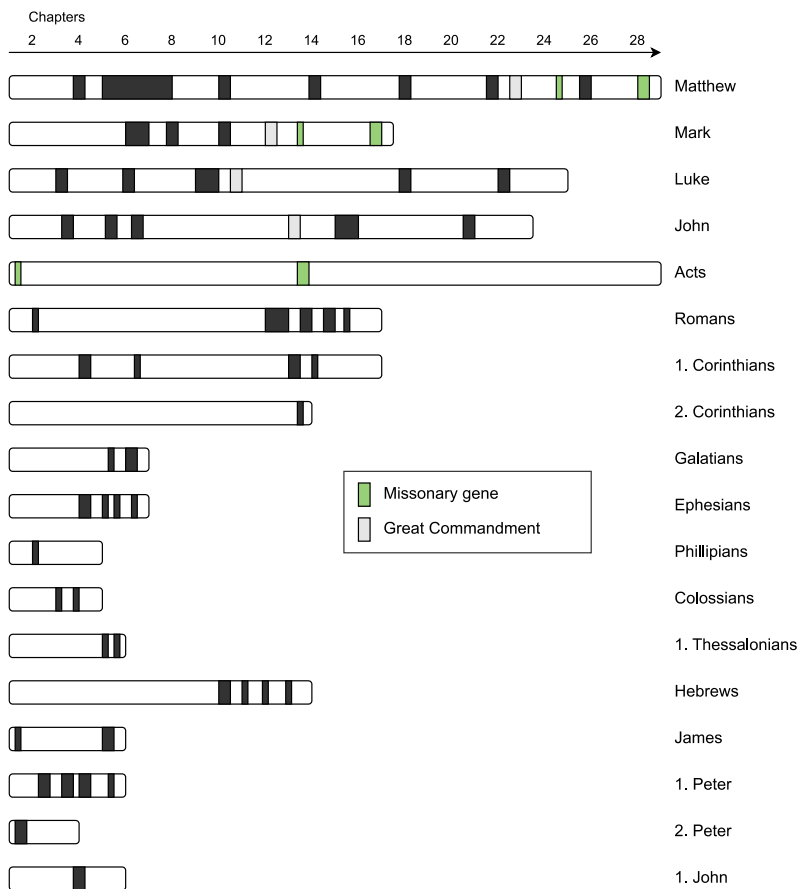
There are additional genes for mission (for example in Matthew 24 & 28, and in Mark 13 & 16), which encourage missionaries to actively spread the Scriptures. Altogether we can count 15 to 30 basic genes for Christianity, depending on how you count, if you count duplicates or not.

The most important and biggest chromosomes for the Christian religion are the books from the New Testament - the four gospels of Matthew, Mark, Luke and John. If we color the places where we find the basic genes, we get the following picture:



This picture shows only the most significant genes. The complete list of all genes is much longer. A more complete version of all genes looks like the picture on the next page (see Appendix for a detailed list of all minor genes). It shows real data from all pericopes that are actually read on Sundays during the year.

We can observe that the book of “Acts” which contains mostly actions and travel descriptions of Apostles is surprisingly empty and lacks genes almost totally, and for the letters the genes are frequently found at the beginning or at the end of the book. The reason is simply that the beginning and the end of the letters often contain appeals to the receiving group to act in a certain way, like “Be patient!” or “Be kind!”.



Good cultural genes are not purely selfish, because they have to get along with other genes. Cultural genes have to get along with genes from the same set. It does not make sense if one gene says “You should not lie” and another gene says “You can lie if you want”. They also have to get along with cultural genes from different systems, and with biological genes.

Our bodies, created by our biological genes, are also the building blocks for the macroscopic organisms of cultural genes. Apparently this can only work if both sets of genes cooperate and get along with each other. Everyone knows that there are sometimes conflicts between both sides, for instance when your conscience contradicts your emotions or vice versa. Jean-Jacque Rousseau said „Conscience is the voice of the soul, the passions are the voice of the body”, therefore emotions represent the interests of the biological genes, while the conscience represents the interests of the society, i.e. of the cultural genes. Good genes do not lead to persistent, irresolvable conflicts.

Successful genes appear in many different systems. Although the Bible has had its days, and it is becoming less important in our modern society, the central commandments and fundamental laws are still the pillar of our European culture, and they are in agreement with our code of civil law, for example the central “do you steal”, “do not lie” or “do not kill” commands that ensure property, trust and life of society members.

Many bigger corporations also have a set of fundamental principles which have a similar function, and are often connected to the history of the company and its founders. Sometimes they are called leadership principles, core values or gold standards. New members have to agree with these core values, principles and standards, whether they want to join a big corporation or a religious group.

Arie de Geus argues that companies that behave as living organisms who learn and are able to adapt to their changing environment are the ones that survive the longest (Geus, 1997). He argues that they...

1. are sensitive to changes in the business environment and in their societies
2. have a strong sense of identity
3. are “tolerant” which means that they are not over-centralized and allow innovative, playful experiments
4. are conservative in their financing which means they try to be debt free and are careful about borrowing money

Good genes care for their own replication. Just as every cell has a complete DNA copy, every small church community and every monastery has a copy of the holy book. Before the printing press was invented, holy books were read and replicated in monasteries, just like biological cells read and replicate DNA constantly.

In the Middle Age monasteries from Christian monks were distributed like sunflower seeds all over Europe, and these monasteries acted like cell nuclei that replicate DNA: they replicated the holy books. Umberto Eco describes this vividly in his novel “The Name of the Rose”.

Now we understand why it was so important to fight heretics and people who criticize the holy scripts: heretics propose changes in the genes or completely different genes, while critics reduce their effect by interrupting the process of gene expression. Every change in the cultural genes implicates a change in the identity of the whole group, and threatens its very existence.

If there is a social DNA which contains cultural genes, how are these genes read? It must happen regularly, since an organism is usually created by repeated gene expression. More about cultural gene expression in social systems can be found in the next chapter.

CULTURAL GENE EXPRESSION

Cultural gene expression can be defined as the communication of ideas in order to persuade people to behave in a desired way, which is nothing else than a definition of propaganda. Philip M. Taylor wrote “Propaganda is really no more than the communication of ideas designed to persuade people to think and behave in a desired way” (Taylor, 2003).

Propaganda comes from the Latin word “propagare” which means “to spread” or to “propagate”. A central part of gene expression is message transmission: “Propaganda generally involves the unambiguous transmission of message” (O'Shaughnessy, 2004).

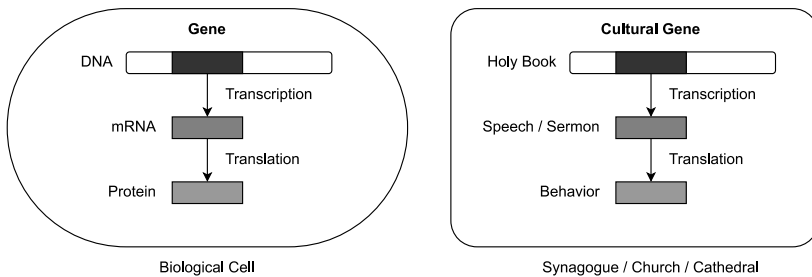
We know the message transmission during cultural gene expression well. It is the classic sermon, public speech or address. On a larger scale it is known as propaganda (Bernays, 1928), more about that topic later. On a small scale the priest or speaker simply reads a text in front of a small audience.

The priest who reads a text and creates a message for the audience plays exactly the role of RNA polymerase in molecular biology, which reads DNA and synthesizes a messenger-RNA from it. In both cases a code which contains instructions is read and a message is created.

In biological systems genes contain the recipe to create proteins, but in general the instructions do not have to specify the creation of proteins. Proteins just happen to be the building blocks of biological systems. Social systems are made of persons and their interactions. Here the social fabric takes the place of organic tissue and the building blocks are not proteins, but the network of relationships, the personality types and the behavior patterns. Cultural genes contain mainly social instructions and behavior patterns.

No matter what the gene specifies, reading a text which contains genes is a gene transcription and the first step of a gene expression. The second step is transmitting the information, and the third step is persuading the receiver to receive and apply the information.

This means the cultural genes of a church are transcribed by a process which we all know, by the sermon of the priest or the public preaching of the reverend. The church service and the sermon are so important because it is the time when genes are transcribed. The process itself is identical to the propaganda we know from political systems.



The reading of the holy text is vital in all big monotheistic religions. In Islam the sermon on Fridays is called Khutbah, in the Jewish religion a section of the Torah scroll is read as part of the afternoon prayer services on Saturdays, and in Christianity the sermon is the center of every church service on Sundays.

We can find forms of gene expression everywhere, from the sermon during church service to the propaganda in political, military or totalitarian systems. It tells us what to do and what to avoid, and it persuades us regularly to adjust our opinions and to believe in certain things.

If an American general in WWII says “always do more than is required of you”, if a German general yells “you should never quit” and “we will never accept defeat”, or if a Roman general insists on “Nemo resideo” (Latin for “No one is left behind”), then they give concrete guidelines how to act in combat. They spread the information of elementary social genes, i.e. they express genes to form their military unit.

Therefore David Sloan Wilson is correct, when he argues that the Darwinian revolution will not be truly complete until it is applied more broadly - to

everything associated with humans and culture (Wilson, 2019). If we do that, we inevitably stumble upon the thesis of this book: the holy books contain cultural genes, and these genes are expressed during church services and sermons. A sermon is an exact equivalent to a reading of genes in a biological cell. It is the same process of reading a genetic code. It is a reading of genes in a cultural cell so to speak. The “cultural cell” is a metaphor whereas the process of reading is real.

In a social context gene expression means the whole process from the reading of the code and the interpretation of the general rule contained in the gene for a specific situation in an actual context to the individual process of persuasion of each individual member.

	Cell	Gene	Expression
Religion	Church	Commandment	Sermon of priest
Politics	Party congress Parliament	Program Law	Speech of politician
Biology	Cell	Gene	Expression
Sociology	School / Family	Social Norms	Speech of teacher / parent
Military	Public place	Rules like „nobody will be left behind”	Speech of general
Art	Museum	Manifest	Speech of artist

The perplexing thing is that the fundamental processes from molecular biology like gene expression can also be observed in social systems. The core of this process in social systems is just transmission of information, or as Luhmann has recognized correctly, communication.

Niklas Luhmann does not manage to identify the genes or the exact process of gene expression, but he writes that the fundamental process of social systems which produces the elements of which these system are built can only be

communication and he argues that “the elementary process which creates the social reality is a communication process” (“der elementare, Soziale als besondere Realität konstituierende Prozeß ist ein Kommunikationsprozeß”) (Luhmann, 1984).

He sees communication as a synthesis of information, transmission and understanding. In any case communication is the essential process, as ordinary and trivial it may sound. Using language for communication is the one thing that distinguishes us from animals. Language does not only allow transmitting of information, it also enables the creation of systems.

Religions or totalitarian parties that want to create a “new man” are not just clinging to an idealistic concept or utopian idea. The manipulation of humans is necessary for their existence. They have to form the individuals they consist of.

When does harmless communication become a gene expression that manipulates behavior? Let us look at propaganda again: “Propaganda is really no more than the communication of ideas designed to persuade people to think and behave in a desired way [...] Propaganda is about persuading people to do things which benefit those doing the persuading, either directly or indirectly.” (Taylor, 2003).

Communication becomes gene expression if the idea that is communicated is able to influence the behavior of people, i.e. if it is manipulative and if the process actually persuades people to think and behave in a desired way. This can be achieved if the communication contains direct or indirect rules for behavior or guidelines for specific behavior patterns in a certain situations. But it can also be reached by different strategies. More about this can be found in the chapter about gene translation.

The desired way to act for religious groups is to participate actively in the group. Jacques Ellul defines propaganda as “Propaganda is a set of methods employed by an organized group that wants to bring about the active or passive

participation in its actions of a mass of individuals, psychologically unified thorough psychological manipulations and incorporated in an organization” (Ellul, 1973).

The message must contain a guideline for a behavior pattern, it must be transmitted unambiguously, and in the end it must be able to persuade the receiver to agree to this guideline which determines a particular behavior patterns. The whole process only has an impact if the behavior of the receiver is influenced and if the receiver understands the message.

Ideological parties and religious organizations consist of people, where every member is an independent, completely functioning individual. But all these individuals are shapeable and susceptible to influences and manipulation. They must be persuaded.

An effective way to persuade people to do something is to appeal to their emotions. Emotions are controlling us as we know from Psychology, and by connecting certain things to specific emotions, it is possible to leverage their power. O'Shaughnessy writes “the power of propaganda is largely the power of the emotional appeal” (O'Shaughnessy, 2004).

To have an impact people first need to listen to the message, then they need to understand it, and finally they need to be willing to do what the message says. Gene expression for cultural genes only has an impact if the recipients are willing to receive the message. It requires like propaganda willing participants and submissive subjects who are willing to believe what they hear (O'Shaughnessy, 2004).

This is basically the reason why faith is so important for the masses. The founders, prophets and priests may be an exception, but ordinary members must have faith. The members must be willing participants in regular meetings and must be willing to believe what they hear. Paul Smaldino and Linnda Caporael called the process that intensifies group-level traits “repeated

assembly” (Smaldino, 2014). Church services are such a repeated assembly where the group-level traits are enhanced and expressed.

These repeated assemblies only work if the participants believe the message of the priests, otherwise it has no effect. Without faith, there is no gene expression. One can say the more extreme the faith, the stronger the effect of gene expression, which leads to a stronger identity, more cohesion in the organization and sharper profile of the collective group behavior. There is clearly a broad spectrum from a small isolated sect to the big Catholic Church which operates worldwide.

Unlike corporations and companies, religious organizations produce nothing but themselves. They are also active in charity and patronage, but that can also be considered as a PR activity to build the own brand. Their genes create basically entities that simply perpetuate themselves. Luhmann called this Autopoiesis. In principle the cultural genes in the holy scripts operate selfishly just like biological genes. They use the entity that they create to create new copies of themselves. It is of course a relationship of mutual benefit, since the members become part of a long-lasting entity in exchange for their willingness to devote their own short lives to the group.

Cultural genes are determining by the process of gene expression the structure of the system: the structure of the total system, and the behavior of individual members. This structure helps the system, as Niklas Luhmann writes, to remain identical in a changing environment which cannot be controlled. Luhmann writes the structure consists in the restriction of interactions and relations that are allowed in the system ("eine Struktur besteht also, was immer sie sonst sein mag, in der Einschränkung der im System zugelassenen Relationen") (Luhmann, 1984).

This system structure can be reinforced by rewards and punishment. In general culture in an organization can be seen as the behavior of the group that is rewarded. It emerges if all successful member act in similar ways.

Gene expression is regulated by so called transcription factors. If there is no gene expression at all, and the genes are not read and transcribed by anybody, then the genes have no effect. Holy books that collect dust on book shelves because they are never read have no impact. The process of gene expressions allows them to become active and alive. And apparently it has to happen regularly to have a lasting effect. We will take a look at the transcription factors in the next chapter. Everybody knows them, in social systems that are built by cultural genes they are known as holidays.

TRANSCRIPTION FACTORS

In biological systems transcription factors determine if a gene expression can begin. A transcription factor in molecular biology is a protein that controls the rate of transcription of genetic information from DNA to messenger RNA (Alberts, et al., 2014).

In cultural systems this task is carried out by the religious holidays: the Sabbath for the Jewish religion, the Sunday in the Christian religion, and special holidays like Passover, Hanukkah, Easter and Christmas. It may be the reason why we have religious holidays at all. A holiday is by definition a holy day. It is a day which is holy because it belongs to the group, and often characterized by festivals, celebrations, meetings and speeches.

In the big monotheistic religions there is exactly one day in the week where the genes are expressed. At this special day of the seven day week the gene expression is turned on, while the rest of the days it is turned off. In the Jewish and Christian religions, a weekly day of rest and worship is one of the Ten Commandments, either on Saturday in the Jewish tradition (the Sabbath), or on Sunday in the Christian tradition. In the Islamic tradition people worship on Fridays (the formal occasion for public preaching is called Khutbah while the Friday prayer is called Jumu'ah).

In modern secular societies where religions fade away and people no longer go to church weekly Saturdays and Sundays are for most of the people indistinguishable from any other day of the week, except that they have a day

off and do not have to work. These holidays were originally created by the rules of the big world religions which say that all members of a religious group have to assemble once a week at a holy day to worship. Sundays in Christianity, Saturdays in Judaism, and Fridays in Islam are like transcription factors which regulate the weekly gene expression. During these special, holy days normal activities are switched off, while gene expression is turned on. During ordinary days normal daily activities are resumed, and gene expression is turned off.

The Code of Canon Law of the Catholic Church regulates how frequent a Mass can be celebrated. Catholic priests are required to celebrate Mass frequently, at least once a week on Sundays when the Mass contain a sermon, but they can also celebrate a Mass daily. Daily church services do not always contain an obligatory sermon. Genes are mostly expressed in the sermon and the homily (a commentary that follows a reading of scripture).

In the Jewish religion the Sabbath in combination with the Triennial cycle of Torah reading regulates the gene expression, while in the Christian religion the Sunday in combination with the lectionary has a regulatory purpose.

In addition to weekly holidays there are special annual holidays which happen once a year, in the Jewish tradition we have for example Pesach/Passover and Hanukkah, in the Christian tradition we have Easter and Christmas, in the Islamic tradition we can find Eid Al-Fitr and Eid Al-Adha. The kind of holiday determines which parts of the genes are read. This means different holidays like Easter and Christmas are transcription factors for different genes.

At Christmas we hear in the Christian Church service the part of the Bible which contains the Christmas story, how Jesus has been born. Christmas and the Christmas story are related to the concept of hospitality. The Jewish Hanukkah festival which is celebrated at a similar time is associated with the concept of Tzedakah (Charity). Both are festivals of lights in dark winter times. It makes of course sense for a group to light candles in dark times and to be hospitable to each other if the environment becomes inhospitable.

At Easter we hear in the Christian Church service the Easter story, how Jesus has been resurrected. The Easter story is related to the concept of renewal and reawakening. Easter is a festival of colors in bright spring times. The Jewish Passover festival which happens at the same time is related to the renewal and rebirth as well. Rebirth and renewal is at the heart of both festivals, and both reinforce the identity of the group by remembering their origins. Both promise redemption and point to nature which is redeemed in spring from the darkness and coldness of winter times. It makes sense for a group to celebrate the colorful reawakening and renewal of nature in spring.

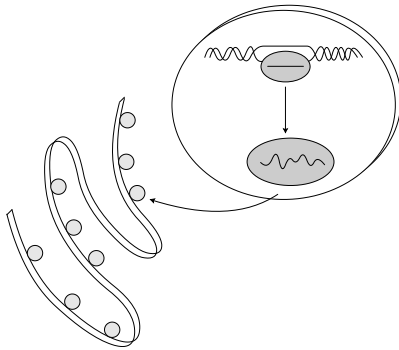
Therefore one can say that the religious holidays have the role of transcription factors, because they regulate if and what part of the holy books and scriptures are read. They are supplemented by additional texts which determine what parts are read at what holiday. In Christianity these texts are named pericopes. Pericopes are brief self-contained passages (from the Greek word meaning “cut around”). They are parts that are actually read on Sundays during the year, see Appendix.

Holidays exist for other systems as well, for example national holidays for nations. The real, original purpose of national holidays is to listen to national leaders which tell their people on the radio or on TV what is right and what is wrong and how great the nation is. Presidents and chancellors usually deliver a speech at national holidays and at the end of the year. In this speech they emphasize the shared values like unity, democracy, freedom, justice, rule of law, etc. and this helps to form the nationality identity. It is a form of cultural gene expression for the nation where everybody who wants to be part of the nation and who is willing to listen takes part in it.

Censorship and propaganda can act as transcription factors as well: censorship suppresses gene expression, while propaganda enhances it, especially if mass media is used. Propaganda also can focus people’s attention to a message or movement, for example it seizes the attention of the public and fixes it upon some detail or aspect which is typical of the entire movement (Bernays, 1928).

CULTURAL GENE TRANSLATION

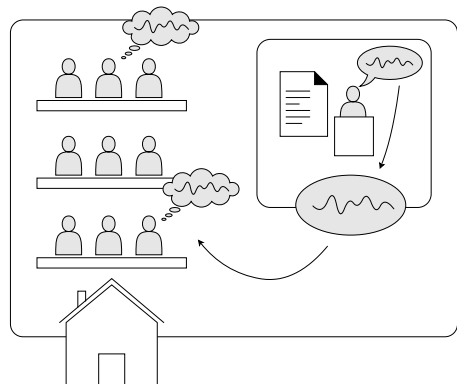
Gene expression has two essential parts: gene transcription and translation. In molecular biology gene transcription is the process of generating RNA from DNA. Translation is the subsequent process where the RNA is used to alter amino acids in order to generate proteins.



In the biological world the process of gene translation looks like this: the mRNA messenger RNA which is produced by gene transcription in the nucleus moves out of the nucleus, where the messages are decoded on ribosomes that are located on the endoplasmic reticulum, a network of membranes around the cell core (Alberts, et al., 2014).

In the social world of cultural genes, messages are decoded by the people of the target audience, in the brains of the group members. After the priest, reverend, bishop or politician has read the text, the process of translation begins. The essential part here is the speech, sermon or address where the person that reads the code and sends an interpretation of the message to the receivers, who alter their goals and intentions to generate a desired behavior if the process is successful.

The members of the religious group which sit on church pews take the roles of ribosomes which sit on the endoplasmic reticulum: they receive the message and must build up the structures that are required to create the organism. They have to learn and remember what they



hear. The learning process itself is a transformation of the message into selfless behavior patterns that help to form the group.

Translation has two parts, sending and receiving. The priest is the sender. He has to adapt the information of the genetic code to the current situation. He has to create the right message and send it to the believers. The believer that sits on the church pew is the receiver who is supposed to hear the message. If the transmission has been successful and the receiver is not distracted, then the message can be stored in the memory of the receiver to put into practice in a future moment.

This is the point where it gets complicated. How are the messages we hear influencing our behavior? Is the behavior really altered? Messages might have a crucial effect or no effect at all. Individual members may be distracted, fall asleep or fail to understand. Even if the message is understood, it takes a while until it is applied in real life. There usually is a certain time which elapses from receiving the message in the temple, synagogue, mosque or church to a concrete action in daily life.

We don't know exactly how the genes are building the phenotype in every detail and how much the messages we hear really influence our behaviors. It is incredibly complex, because it can be a long way from the things we hear and learn to the things we say and do. To be fair we don't know this for biological genes either.

It might seem hopeless to describe and predict the consequences of gene translation because the detailed conditions and circumstances are unknown, as Leo Tolstoy writes in "War and Peace":

"What science can there be in a matter in which, as in every practical matter, nothing can be determined and everything depends on innumerable conditions, the significance of which is determined at a particular moment, and no one can tell when that moment will come?"

Reasons and logic alone hardly change our behavior. When it comes to inspiring people to embrace new behavior patterns, appealing to emotions and good storytelling are the only thing that works. Brian Boyd argues that stories are a kind of cognitive play which allows us to explore possible actions and their outcome. He emphasizes that our minds would be shaped to understand them (Boyd, 2009).

Biblical stories contain either direct commandments or hidden rules for behavior in form of a convincing story. The Bible is a large collection of stories that describe the history of the Jewish people, and how to endure in the face of defeat. The Bible itself was created as a response to defeat of ancient Israel by Assyrians and Babylonian armies (Wright, 2020). The biblical authors have responded to this defeat by collecting the fragments of their pasts and weaving them into a historical story.

Successful stories like the stories in the Bible appeal to our emotions, and emotions play a big role in controlling our behavior, since they directly control the readiness for action (Frijda, 1986). To understand the intricate ways how communication influences behavior, we need a good understanding of psychology. Luckily, our knowledge of psychology and marketing helps us to understand the process.

In psychology, the essential parts of the gene expression process where the message arrives at the destination and has an effect are called learning, adaptation and “conversion”. William James writes that the important process which is related to a special “religious” experience and particular emotions is the conversion process. He writes “To say that a man is 'converted' means, in these terms, that religious ideas, previously peripheral in his consciousness, now take a central place, and that religious aims form the habitual center of his energy” (James, 1902).

This conversion basically takes place by appealing to emotions, similar to Paxton's mobilizing passions in fascism that causes a person to join the movement: the holy texts create an existential dread and deep fear in the

individuals, a sense of overwhelming crisis beyond the reach of any solution, and promise a solution at the same time (Paxton, 2004). For example they remind us of our mortality and the eternal perils of hell, and promise us immortality and heaven at the same time if we believe in the texts. This similarity of religions and fascism here is no accident, as we will see later.

As humans we are adaptive and flexible. Our behavior patterns are not hard-wired in the genetic code. They depend on our worldview, which is formed by everything we experience. To understand how speakers form our worldview, we need to understand the basics of psychology and marketing. It is important if emotions are involved or not, what terminology and words are used, how an issue is presented and “framed” and if we are willing to listen at all. George Lakoff describes how complicated this can be (Lakoff, 2014).

An essential part of forming a worldview are the subjective judgements and opinions about who is good & who is bad, what is right & what is wrong, what is good & what is evil, or what we should do & what we should avoid. Together these opinions form our word view and influence our character and personality, which in turn shape our actions.

There are two core problems of gene translation from the cultural perspective. Will the people do the right thing if they have received the message, and will the priest send the right message in the first place? In many situations the laws encoded in the genes are not directly applicable, either because society has changed, or because the situation does not fit. In this case the sermon of the priest should offer interpretations that make the laws applicable for the current situation. The talk of the politician, the speech of the company boss or the appeal of the general has basically the same purpose. It mobilizes and motivates the receivers of the message to do the right thing. All of them can be programmers of collective behavior patterns, especially in totalitarian systems, where they align the behavior of the group in a certain way that is consistent with the desired ideology. Their interpretations turn abstract genes into concrete behavior patterns for certain situations.

Gene translation means the genetic information is translated into the right language and into the right context to create the building blocks of the organism. Cultural **gene translation** is the communication process in the time range from the creation of the message during gene transcription to the actual change in behavior. The translation can be influenced, suppressed or enhanced in multiple ways. It can be enhanced by media, from the classic letterpress printing that produces books, journals and newspapers to the mass media that uses radio and TV.

Not all translated information actually lead to a change of behavior. Some have a strong effect, other no effect at all. In marketing and advertising we study the ways how to influence and manipulate the opinions of people. Brands and emotions are important tools here.

Skilled speakers use all techniques known from the fields of marketing and advertising to influence their audience. We know well that advertising manipulates people (Luhmann, 1996). It is to some extent the definition of advertising: to manipulate customers to buy products. Advertising means to describe or draw attention to a product, service, event or organization in a public medium in order to promote sales or attendance.

It is the goal of **advertising** and marketing to sell more products. Since people are controlled by emotions, it is possible to sell more products if you manipulate emotions, for instance by promising them that they will be happy and healthy if they buy a certain product, even if it actually has the opposite effect.

In this sense marketing can be seen as the art of lying, because it uses brands and advertising to distort the truth and to manipulate opinions. The goal is to put a certain product in the right perspective, even if it means to bend the truth until it nearly breaks. In the extreme case we get propaganda and censorship which define the spectrum of the speakable.

Censorship can inhibit gene translation totally. It limits the amount of material that can be published for example by prohibitions. In the most extreme case it can lead to book burning. It can be seen as a reaction of a system to dangerous gene material that threatens the integrity of the system. In the world of molecular biology, the tools that suppress gene translation are often useful to fight against hostile intruders like bacteria, since “many inhibitors of prokaryotic protein synthesis are useful as antibiotics” (Alberts, et al., 2014).

In the cultural world writings from heretics who differ from the ideology of the system threaten the system because they lead to a disturbed gene expression or a gene expression that creates a different system. This foreign gene expression can be eliminated by burning the writings or even their creators. This means the Medieval Inquisition (Black, 2009) and the Spanish Inquisition (Pérez, 2005) in the Middle Ages acted like an immune system that extinguished faulty cells which threatened the integrity of the system.

Propaganda is the opposite of censorship. It means the repeated spreading of biased information to promote a certain point of view, and is related to regulation of cultural gene expression on a large scale. It can resemble organized lying.

Effective propaganda is using modern mass media as a tool to enhance and to control gene expression. Propaganda and censorship supplement each other to form the spectrum of the speakable. Together they define the types of code that can be expressed and translated.

Meditation means silence and quietness which increases concentration. During a standstill of all mind activities the expression of translation of “cultural genes” comes to end as well. It can be considered like sleep as a cleaning that resets the system to the original state. In the context of cultural gene expressions meditation is like fasting for the mind. It suppresses all undesired gene expression.

A **prayer** is essentially a part of gene translation, if you define it as a dialog with the future self, individually or collectively. In this sense a prayer can indeed change the world, because the future self remembers the message from the former self and changes the behavior accordingly. It creates a channel of communication from the current to the future self.

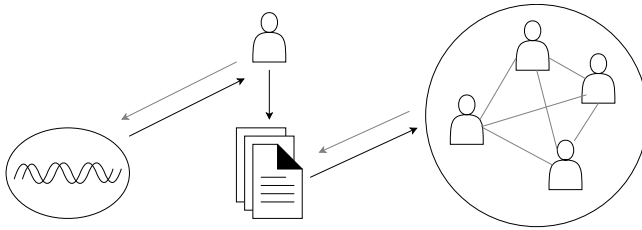
Family photos are similar. You look into the camera, but the camera is only creating photos that are viewed most likely by yourself in the future, i.e. by your future self. During prayers we speak to ourselves, and this can create memories that are remembered by ourselves in the future. You speak in prayers first of all to you future self. If you consider it like this, it can be quite effective for purely psychological reasons. Kierkegaard said “The function of prayer is not to influence God, but rather to change the nature of the one who prays”. Concentration and collective attention can have a strong effect.

Let us summarize:

- **Chromosomes** ⇔ Holy books (mainly 5 books of Moses or 4 gospels)
- **DNA** ⇔ Text in Scriptures
- **RNA Polymerase** ⇔ Priest
- **Reading a Holy Book** ⇔ Gene transcription
- **Holding a Speech** ⇔ Gene translation
- **mRNA** ⇔ Speech
- **Transcription factors** ⇔ Religious holidays
- **Ribosomes** ⇔ Brains of group members
- **Church service** ⇔ Gene expression
- **Censorship** ⇔ Suppressing the expression undesired genes
- **Advertising** ⇔ Enhancing the expression of desired genes
- **Propaganda** ⇔ Large scale regulation of expression, organized lying
- **Mass media** ⇔ Tools to enhance gene translation
- **Meditation** ⇔ Suppression of undesired gene translation
- **Prayer** ⇔ Enhancement of gene translation, talk to the former self

BEHAVIOR PATTERNS

The final products of gene expression in biological systems are complex proteins. Biological genes encode proteins and enzymes that are the building blocks of biological organisms and control the behavior of biological cells. The final products of gene expression in social systems are complex as well. Cultural genes encode social instructions and behavior patterns that lead to certain personality types, behavior patterns and relationships which create the social fabric. They contain instructions for social behavior.



For religious systems this means that the task of the church services is mainly to generate and maintain the social fabric that keeps the group together. One could say it is a form of synthesis of behavior patterns.

In order to understand how cultural genes affect behavior patterns we have to know how the mind works. Luckily psychologists and cognitive scientists already know a lot about it (Pinker, 1997). As we know from Psychology, the mind is adaptive, and because we are adaptive, we are able to learn from others. Others can persuade us to believe something or to change our mind. In order to learn something we have to do it repeatedly. Marcus Aurelius knew that “the soul becomes dyed with the color of its thoughts”. Repetition is important for learning (Hilgard, et al., 2014).

Therefore it is not surprising that the gene expression we observe for cultural genes happens regularly. Protein synthesis in biological cells is balanced by the natural loss proteins through degradation and decay. In social systems the synthesis process is balanced by the natural loss of memory through neglect,

oblivion and other influences of the complex and constantly changing environment. Just like a biological cells ceases to function if genes are not expressed anymore, a religious group decays if the members do not attend church services anymore.

What kind of behavior patterns is generated by cultural genes and how do these patterns look like in details? In biological systems a messenger RNA has successfully fulfilled the purpose if it has created a protein. As Luhmann says, communication is an essential factor in social systems (Luhmann, 1984). In social system a message has successfully persuaded someone if it has altered the beliefs and opinions, which is in essence what advertising, marketing, and propaganda are trying to do. In the case of the religious group the essential measure of success is if the person participates actively in the group or not.

Cultural genes create and alter beliefs, opinions and intentions that shape our behavior. They contain fundamental rules for the desired behavior that affect the whole perception-action cycle of individuals. During the process of gene expression, the abstract instructions in the cultural gene are translated into concrete rules for specific contexts. These rules have to be taught and learned. Arthur Schopenhauer argues that religion is linked to training of behavior patterns and taming of minds: Christian's are for instance trained to cross themselves on certain occasions, and Muslims learn how to pray 5 times a day. He says:

“It may be said that religion is the masterpiece of the art of training, because it trains people in the way they shall think; and, as is well known, you cannot begin the process too early.” (Schopenhauer, 2012)

Gene expression in social systems is hard to measure because opinions and sentiments are inaccessible and certainly subjective. And the expression itself is a fuzzy process, because it increases the probability of the target group to act in a desired way. Emotions act similar. They are not just a thing we feel. They also influence the way we act. Emotions work by chemical messengers and hormones which increase our probability to act in a desired way and prepare us

for actions. Since Nico Frijda we know that emotions are basically changes in action readiness. They control us by increasing our readiness for action. Specific situations trigger the release of certain hormones that increase our readiness for action, which in turn increases our ability to survive and to reproduce. One can say emotions are hard-wired recipes for behavioral patterns in specific situations. Disgust makes us ready to avoid something, fear prepares us to run away, and anger makes us ready to strike (Frijda, 2006).

Cultural genes are doing the same thing. They increase our readiness for action, by providing recipes for behavioral patterns in critical situations. Gene expression results in a change of beliefs and opinions that increase action readiness in certain situations. The more we are reminded of their existence and importance, the stronger they can influence our behavior. In other words the more frequent a gene is read and expressed, the more effective it is in influencing the behavior.

In biology proteins are made of amino acids and are encoded in the genetic code. In sociology the building blocks are social instructions which are encoded in ordinary texts in the Latin alphabet of plain language. During gene expression these instructions are communicated to the audience.

If an audience listens to a speech it just receives words, but words can influence our actions, change our habits and form our characters, because humans are adaptive and able to change. In the course of time all these small changes sum up. If the audience remembers the words and believes the message, then it can result in concrete actions, and they repeat these actions they become habits. It is like the famous quote that says (to my knowledge the real origin is not entirely clear, some say it is from the English writer Charles Reade or the Chinese philosopher Lao Tzu)

“Watch your thoughts; they become your words
Watch your words; they become your actions
Watch your actions; they become your habits

Watch your habits; they become your character
Watch your character, for it will become your destiny.”

If we want to influence the behavior of people strongly, we have to give them a moral compass and explain them guidelines which they can use. In other words we have to reinforce and strengthen their conscience and shape their worldview. John Teehan argues that moral systems are essential to our culture and that religions are just expressions of our evolved moral psychology:

“If a society is to function at a level beyond the clan it must develop a system to effectively encourage and reward cooperation, and to discourage and punish defectors and cheats. This is what moral systems are designed to do: to establish a code of behavior that promotes and rewards behavior necessary to cohesive social functioning, while condemning and punishing behavior contrary to cohesive social functioning.” (Teehan, 2010).

It is of course the task of the priest or reverend to establish this code of behavior, to explain the abstract commandments and to turn the general laws into concrete rules of conduct that specify what to do in which particular context.

A sermon is an interpretation of the holy text for the current situation and momentary context. Sometimes these interpretations are attached to the original text, like the catechisms in Christian or the Talmud in Jewish religion. Usually they are addressed to the priests and clergymen that want to explain the elementary laws.

David Sloan Wilson says that catechisms are a goldmine of information if you want to consider religions from the evolutionary perspective (Wilson, 2003). He considers the example of Calvin's catechism and argues that it might come close to a cultural genome. If we consider the commandments and laws as the real genes, then a catechism is the result of a gene expression and gene translation where the meaning of the law is explained. It is not the genome which contains the laws and instructions itself.

Gen Expression	Gene 5	Gene 7	Gene 8
Gene	5. Commandment: You shall not kill	7. commandment: You shall not steal	8. Commandment: You shall not bear false witness against your neighbor
Behavior pattern (Luther's catechism)	We should fear and love God that we may not hurt nor harm our neighbor in his body, but help and befriend him in every bodily need in every need and danger of life and body	We should fear and love God that we may not take our neighbor's money or property, nor get them by false ware or dealing, but help him to improve and protect his property and business that his means are preserved and his condition is improved	We should fear and love God that we may not deceitfully belie, betray, slander, or defame our neighbor, but defend him, and speak well of him, and put the best construction on everything.
Conserved Social Property	Life	Property	Trust & Truth

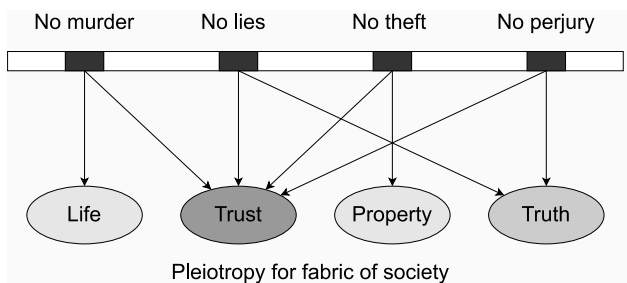
The small catechism is a kind of „small gene expression” of all central Ten Commandments. Take for example the 8th commandment against perjury. Martin Luther says the 8th commandment „ You shall not bear false witness against your neighbor” means “we may not deceitfully lie or betray our neighbor, but defend him, and speak well of him”. This is a concrete explanation and interpretation of the commandment for daily life that everyone is able to understand. He translates the abstract commandment into concrete rules of conduct and practical guidelines for behavior. This is a gene translation.

The more general commandment for gene 8 is “You shall not lie”. It also occurs in the Bible. There is for instance a direct “You shall not lie” commandment in Leviticus 19:11, which can have multiple meanings. It basically means you should not make false statements or break the truth. In situations where others ask for advice it can mean that you should not intentionally deceive others, in embarrassing situations if you cannot tell the truth it can mean you should remain silent, in court it can mean that you should not commit perjury or bear false witness. The task of the priest is to pick the right meaning in the right context to create the correct behavior patterns.

What kind of gene types lead to what behavior patterns? The relationship between religion and church attendance on the one hand and crimes and delinquency rate on the other hand is complex. The religious commandments have been superseded in modern societies by secular laws, and a criminal might attend a church frequently because he hopes to find salvation for his sins. Frequent church attendance alone does not automatically mean lower delinquency rate, unless everyone really believes what the priest says, but it is also likely that persons who take religions very seriously do not commit crimes that are considered as sins in the respective religion.

It is also obvious that in general altruistic rules will increase altruism, anti-lying rules will increase honesty, and anti-killing rules will decrease capital crime rates – IF the people really obey them. “Do not lie” rules decrease lies if they are followed, “Do not murder” rules decrease murders if they are obeyed. This means cultural genes will increase primarily the behavior patterns that they encode directly if they are effectively expressed.

The relationship between genotype and phenotype is also complex because a gene can influence two or more phenotypic traits. This is named Pleiotropy in evolutionary biology. For the four genes just mentioned (commandment 5, 7, and 8 and the additional “You shall not lie” rule), trust is the property which is caused by multiple genes. The fabric of a society is essentially made of trust: trust that nobody tells you lies, nobody steals your property, and nobody takes your life. Multiple genes are needed to be expressed to create it.



The cultural genes mentioned above conserve a certain social property like trust and cooperation. Religions that prohibit lying and cheating and crimes like murder will not only reduce crime rates and the willingness to lie and to cheat. They will in turn also increase trust, because all these activities break trust, and if they can be avoided, trust will be conserved. Guiso, Sapienza and Zingales examined data and found not surprisingly that “religious people trust others more, trust the government and the legal system more, [and] are less willing to break the law” (Guiso, et al., 2003)

In general the golden rule (the principle of treating others as you want to be treated) and other prosocial behavior rules like the law to “love your neighbor as yourself” and the law to “love your enemies” increase cooperation and reduce conflict and in-group quarrels. Religions compel man “to forget his selfish interests in the common interest and to submit, through taboos, to social discipline” (Evans-Pritchard, 1965) It is of course very useful for bigger groups to increase trust and cooperation and to decrease conflict and quarrels. And this is exactly what the big monotheistic religions do, says Ara Norenzayan in his book (Norenzayan, 2013).

In biological systems a group of multiple proteins can form a protein complex. Similarly in social systems a group of multiple beliefs and opinions can form a consistent worldview that is consistent with the ideology of the religious or social group. In societies it is related to conscience, in religious groups to the idea of the Holy Spirit – the spirit of the group that guides the members to act within the limits of the group.

NON-CODING DNA

Not every word contained in the holy books encodes a gene and guides our behavior. There are also parts which encode a gene that are not expressed. The majority of the text does not encode a gene at all, for instance information about historic events or parts that describe genealogies. Just as in molecular biology, we can find non-coding text parts which do not encode genes. For social systems parts of non-coding DNA are read during gene expression, but do not change the behavior patterns. They are the equivalent of non-coding RNA, RNA molecules that are not translated into proteins.

Communication becomes propaganda if there is an intention of persuading the audience to follow a certain worldview (Taylor, 2003). The use of propaganda techniques can change people's attitude, beliefs and opinions. Gene expression is nothing else but propaganda for the worldview of the cultural genes, and like all propaganda it can be effectively used to persuade people.

Some parts of a propaganda speech contain direct instructions what the audience should or should not do. Not every part of a speech contains direct instructions that guide behavior. Some parts can persuade people to believe something, which in turn can cause them indirectly to do something. Some parts do not contain beliefs, intentions or instructions at all. They do not encode behavior patterns, and they are not encoding cultural genes. They correspond to non-coding DNA.

Just like not every part of a propaganda speech contains a concrete behavior pattern, not every part of a holy book contains a cultural gene. The good thing is that we can understand the non-coding parts. Unlike non-coding DNA in biological systems it is much easier to identify the function of non-coding DNA in cultural systems, because we can understand the code. Some non-coding parts are just dead freight. They have no function other than providing background information and a broader context for the stories:

- information about historic events (like a census or a conquest)
- parts that describe genealogies (like Matthew 1:1-16 or Luke 3:23-38)

Other non-coding parts are read during gene expression but serve as preparation of the gene expression itself, for example information about historic actions and daily life such as

- which actor travelled to which city or country
- who arrived where and when
- what actor stayed how long in a place
- who cut his hair and who ate what
- who was arrested, put into prison and killed
- who attended what temple or synagogue

As we have seen earlier chapters, the Book of Acts in the New Testament is full of these non-coding parts, because it mainly describes the “Acts of the Apostles”, which is another name of the book. It contains nearly no parts that can be identified as cultural genes.

Non-coding parts do provide the context for certain stories, though, and help to understand why the people acted the way they did. Other non-coding parts are read but are mere historical remains of historic interest. This makes the cultural genes even more important.

Cultural genes can be identified by asking if the text part intervenes in human interactions and if it is able to influence human behavior. Commandments and interdictions obviously have the power to shape human behavior, because they tell us what we should do and what we should avoid. Text parts that say who is the son from whom, who travelled where, and who cut his hair apparently do not directly influence our decisions.

This means we are basically able to distinguish between coding and non-coding regions religious texts. Coding regions contain genes, while non-coding regions do not contain genes.

We cannot only found coding and non-coding regions exactly as in biological DNA, for old manuscripts the text is even wrapped around scrolls like DNA around Chromatin. The analogy goes further: epigenetic marks can alter the

chromatin structure and determine which genes are expressed and change the chromatin structure. Loosely packed chromatin structures are more accessible to gene expression than tightly packed chromatin structures, just like opened scrolls are easier to read than closed scrolls. Code from closed scrolls cannot be read, just like DNA code from densely coupled chromatins cannot be expressed.

Rules which are not read, not expressed or not followed if they are expressed are just like rules that do not exist, which means coding parts can become indistinguishable from non-coding parts if they are suppressed or not read any more. This can happen if they have become obsolete. For example in Leviticus 18 there is a long list of commandments about allowed sexual relations which contradict the rules in modern societies. Therefore they will probably be skipped in modern societies.

Cultural genes are the most important part of the holy books, because they are in principle sufficient to create and to control the whole social organism. The other code parts provide the context, the history and the environment in which these genes are embedded. They can be meaning less padding or meaningful context, introduction or epilogue, or simply parts of historic remains from the times when the genes where created.

The majority of the text in holy scripts does not contain encoded genes in form of fundamental rules and basic commandments. It can be compared to non-coding DNA, i.e. content which does not contain code for genes and which is not used for the purpose of gene expression. Nevertheless this content can be important for the correct gene expression of other parts. It can prepare and support the expression of other parts. Jacques Ellul mentions for example “pre-propaganda” which predates and prepares the actual propaganda (Ellul, 1973).

For eukaryotic organisms in biological systems 99 percent of all genetic code is non-coding DNA, usually only a small fraction of 1-5% contains DNA which directly encodes genes. For cultural genes it is similar: between 2% and 4% of all verses contain basic rules and commandments. A majority of the genome

consists of non-coding regions like genealogies or irrelevant information about the historic context.

Let us take a look at the holy book of Christianity: there are about 23,000 verses in the Old Testament and 8,000 verses in the New Testament, all in all about 31,000 verses. Some of them are commandments which encode genes, while others are just non-coding text parts. The most famous are of course the 10 commandments.

2.6% of all verses in the Torah (Jewish) or Old Testament (Christian) are commandments. There are in fact 613 commandments in the Torah; in Jewish tradition they are called Mitzvah (singular) or Mitzvot (plural). 248 rules are positive commandments that say what people should do and 365 rules are negative commandments that determine what people should not do.

For the New Testament of Christianity we arrive at a number of 4.5% if we count all 72 genes from the Appendix and take an average of 5 verses for each gene we get $72 \text{ genes} * 5 \text{ verses/gene} / 8000 \text{ verses} = 4.5\%$.

Cultural genes contain often the history of their own creation, both for the Jewish and the Christian religion. Biological DNA mirrors the story of life itself as well: it contains very old parts and younger regions, genes of central importance which are often very old, like the Hox genes for example, and less important genes which are much younger. Genes do not contain the history of their ancestors directly, but many ancestors left their traces in it (Dawkins, et al., 2004).

For cultural genes the art is to recognize the essential parts in the flood of information and communication, to identify those parts that encode in fact cultural genes. Today we drown in flood of information from all sides, so that political speeches lose their power, social groups begin to dissolve and ideologies solidify into a frozen bureaucracy.

The essential difference between coding and non-coding areas is if they are able to influence our behavior. This is the case if we can find a sequence of instructions or recipes:

- **Coding** regions: regions that intervene in human interaction where behavior patterns are encoded in form of behavioral rules, laws, commandments, interdictions, instructions or recipes
- **Non-coding** regions: regions which do not intervene in human interaction because they do not directly encode behavioral rules, laws or commandments

A behavioral rule is a simple rule, instruction or commandment which tells you what to do. It can also be hidden in a short story, myth or metaphor that needs an interpretation to extract a rule. Coding and non-coding regions can be read and spread alike, but only a coding region can be used in propaganda to influence the behavior of people.

Originally speeches had exactly the purpose to influence and persuade people to do something. In the past the priest explained our ancestors in the church once a week how the world works in 30 minutes. Then we used to listen to Radio speeches and TV. In the 20th century people were used to listen long speeches in radio and TV. The speeches became shorter in the course of time, and today people are getting bored if a speech of a priest or politician takes longer than the 5 minute attention span of a pop song.

In the daily flood of information today where everyone and everything is marketing himself, herself or itself, respectively, it is hard to say where coding DNA starts and where it becomes non-coding DNA.

Already Luhmann knew the importance of distinguishing between coding and non-coding regions of communication: "Events must be distinguished between coding and non-coding ones. Encoded events have a lasting effect in the communication process as information, non-encoded ones as disturbance or noise" ("Ereignisse müssen nun in codierte und nichtcodierte unterschieden

werden. Codierte Ereignisse wirken im Kommunikationsprozeß als Information, nichtcodierte als Störung oder Rauschen") (Luhmann, 1984)

Strangely he does not talk about genes in this context, although the name non-coding is inextricably linked to genes in molecular biology. It is even defined in terms of genes. But Luhmann fails to see the genes. He uses „coding“ more in the sense of a reference to the meaning of a message.

So far nobody had the idea that a speech, sermon or propaganda text could be the equivalent to DNA expression in a biological cell. Why? Niklas Luhmann has been close, and recognized the importance to distinguish between coding and non-coding events. He also emphasized the significance of communication. But he did not make the final step to identify the genes and the process of their expression.

Why has nobody noticed the fundamental agreement between these basic biological and social processes? One reason is that we are ourselves part of the process which is so ordinary that it appears normal and insignificant for us. The greatest mysteries hide behind the most ordinary things. Another reason is that religions defy any investigation because they are protected by powerful taboos and they are based on subjective beliefs and abstract ideas which are hard to investigate. For these reasons scientific investigations are almost impossible.

And yet it is the same process of transcription and translation which uses encoded information to generate organisms. One is a mental, social process, which happens in our society and our mind. One is a physical, biological process in our cells. In both cases genes are read and transmitted to create something. In both cases genetic information is stored, read, interpreted and passed on to create organisms.

One difference is that for cultural genes not only the genes themselves are read and expressed, but for holy texts usually all text is read, even the text of the non-coding regions. The text parts which contain the genes are of special

importance, but normally the non-coding parts are read as well for all holy books.

This text parts from the non-coding regions are not used to create “behavioral rules” directly, because they do not contain direction instructions and rules how to behave. But they can help to explain the history and the context, which helps to understand the encoded parts. This means they can prepare and support the expression of rules from the coding regions.

The basic mechanism is not only similar, it is identical. Just as genes are read in cell to produce a message in form of RNA which is used to make proteins to maintain the organism, cultural genes are read in a temple, church, mosque or synagogue to produce a message which is use to change behavioral patterns to maintain an organism. This is the secret of the hidden genes.

Coding and non-coding parts of the genome are used to create and maintain an organism. In biology it is the biological organism, in sociology it is the organized group. Cultural genes have a dual impact, first on an individual level and second on a collective level. In social organizations they form the collective character of the community and the individual personalities of the members.

SWARM-INTELLIGENCE

Historian Yuval Noah Harari claims that humans have generated collective myths, and the shared belief in these invented common myths would keep the society together: “Any large-scale human cooperation - whether a modern state, a medieval church, an ancient city, or an archaic tribe - is rooted in common myths that exist only in people’s collective imagination. Churches are rooted in common religious myths” (Harari, 2015).

While it is true that some myths are invented, many of them have a true core. We know for example for the case of Noah's flood that the ancient Egyptians and Sumerians both lived along the hot river valleys in ancient Egypt and Mesopotamia, respectively, where the rivers caused unpredictable floods. The flood disasters from Tigris, Euphrates and Nile certainly contributed to the creation of the myth. William Ryan and Walter Pitman describe in their book “Noah's Flood” another option, namely that a rapid rise in sea level of the Black Sea might be the true historic core behind the myth of Noah's flood (Ryan, et al., 2000). Whether this controversial Black Sea deluge hypothesis is true or not, the flood disasters of the big rivers certainly contributed to the creation of the myth.

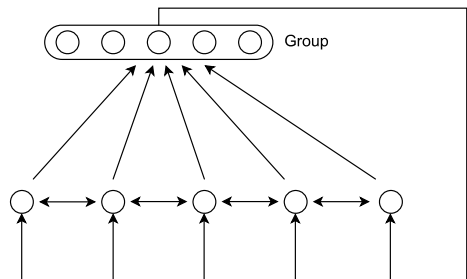
Churches are much more than the belief in a religious myth. All organizations are based on real people and have a real history. The idea of a collective or community may be abstract, but the members are real. The group is real. The history of the group is real too, even if it is not described completely accurate in hindsight. For religious groups, the story of the organization and its founders is often contained in books which are considered holy to its members.

One might argue that these books contain only dry texts of past events and dead people. But it is also true that we can only really understand society as a set of complex adaptive systems, if we understand the elements and processes that lead to the emergence of abstract collective organizations and social groups (Sawyer, 2005).

The secret to understand societies and their religions is contained in the holy books. The rules in these books are not arbitrary. They describe the interplay and interaction in a social group. Even if they are not completely accurate historically, they are sufficient to have a real effect. These texts have in fact the power to create organisms and to bring groups to life, but only if they are really read and applied regularly. They change the life of people who are willing to hear the message, because they regulate the social life. The result is that people form a collective swarm-like entity. The German poet Schiller said that it is the spirit which builds the body (“Es ist der Geist, der sich den Körper baut”). Apparently this is also true for social systems generated by cultural genes.

If there are elements that “generate” a society, it is of course indispensable to study how the elements interact. This is done in the fields of “emergence” (Johnson, 2001) and swarm-intelligence. John H. Holland argues “that the study of emergence is closely tied to the ability to specify a large, complicated domain via a small set of ‘laws’” (Holland, 1998).

The rules that generate a collective group have a certain form and character, as we know from various studies of swarm intelligence (Eric Bonabeau, 1999). They usually contain a rule to follow the group (which can be represented by a pheromone path in the environment too), and often an opposing rule to stay away from individuals.



For cultural genes it is similar. There must be at least one rule that forms a coherent unit out of loosely coupled entities. Otherwise there would be no swarm, group or collective entity. Therefore the texts usually contain a central rule to love the group and to stay close to it.

There also have to be rules to conserve the freedom of individuals in order to avoid fights and quarrel between the members and to ensure their safety. Therefore the texts also contain rules to respect the rights of the individuals and to keep a distance from them.

Together these are the classic swarm rules: stay close to the group, but stay away from particular individuals. The group imposes restrictions on the individuals, and individuals obey them, although they make the group possible in the first place. We can find these classical rules in religious texts as well.

If you look at the most important commandment of the bible, you will notice a fundamental connection to the principles of swarm intelligence. One of the most important commandments is the rule to love God. The Christian New Testament says the greatest commandment is “Love the Lord your God with all your heart and with all your soul and with all your mind” (Matthew 22:37), and the Old Testament or the Jewish Torah contains a similar commandment: “Love the Lord your God with all your heart and with all your soul and with all your strength” (Deuteronomy 6:5).

As we have seen in the previous chapters, to love God means to love the group, if we try to view the problem from a sociological perspective and identify God and the group. The first and most important rule of the Bible is to love the group. To love the group means to be with the group, to participate regularly in group events and meetings, to support other members of the group, to advertise the group, and to win new members for the group.

In other words “Love the Lord your God” means effectively “Stay with the group”, “Follow the group”, “Do what the others do” or simply “Be where the others are”. These are exactly the central principles of swarm intelligence (Bonabeau, et al., 1999). It is the collective force that forms a coherent unit out of separate individuals, for example in fish swarms or bird flocks.

One of the first who stumbled upon the rules to create a swarm is was Craig Reynolds (Reynolds, 1987). His famous “Boids” rules for the swarm behavior

of bird-like objects are simple, and partially responsible for some of the beautiful collective phenomena we can observe in nature (Flake, 1998). The rules say move in one direction...

- ..towards the average heading of flock mates (**alignment**)
- ..towards the average position of flock mates (**cohesion**)
- ..to avoid crowding local flock mates (**separation**)

These 3 simple rules are the foundation of swarm intelligence (Eric Bonabeau, 1999), because they allow the formation of swarms. If a swarm meets an obstacle, it splits itself in front of the obstacle and merges again after the obstacle. The form of the swarm and the typical split-and-merge behavior emerge without being specified directly (Rolf Pfeifer, 2001)

The 3 rules can be summed up in 2 basic rules which consist of one attractive and one repulsive force. You only need two fundamental rules to create a coherent group out of loosely-coupled individuals: global attraction and local repulsion

- Stay with the group
- Stay apart from individuals

The first rule is an attractive force that keeps the group together, because every flock mate tries to reduce distance to the flock as a whole if it gets too large.

The second rule is a repulsive force that avoids the collision of individuals. Every flock mate keeps a distance to other individual flock mates and respects their private region.

The continuous interplay of both opposing rules creates a coherent swarm. The strength and ratio of these two forces determines the size and the density of the swarm. If the attractive force is stronger it will be a small and compact swarm, because the density increases. If the repulsive force is stronger it will be large and sparse swarm, because the density decreases.

If we paraphrase the rules a bit different for the sociological context, we arrive at the central rules for the Jewish and Christian religion.

- You should love the group and love your neighbor as yourself
- You should stay apart from individual neighbors and respect their life, their personal space and their private property

The first rule is a form of aggregation, while the second rule is a form of cooperation. One rule is attractive and says the agents should stay close to each other, the other is repulsive and sets limits how close they are allowed to come.

These two basic rules are in compact form the most important rules of the Jewish and Christian religion. The first is essentially the Great Commandment in the New Testament which is duplicated at least 3-4 times (Matthew 22:35-40, Mark 12:28-31, Luke 10:25-28, John 13:31-35) and can also be found in the Old Testament (in Deuteronomy 6:5 and Leviticus 19:18).

We see that the basic rules of the two largest monotheistic religions follow the same pattern we can observe in the area of swarm intelligence. They are isomorphic. Swarms are an agent-based model (ABM) of religious groups. Vice versa we can say that fishes and birds form a swarm because they follow central “religious” rules, which are hard-coded in biological genes.

Like the members of a swarm, members of a religious group come together, act together, think alike and make in fact similar subjective experiences. Their rituals are common actions and their shared beliefs are common perceptions. Both core elements of religions, beliefs and rituals, are based on common cognitive processes shared in a group of individuals.

Members of a religious group live in a kind of filter bubble which is more or less sharply delimited from the environment. Inside the bubble you are surrounded by friendly people who have a similar world view and share your beliefs and opinions. You are reading and hearing the same texts which confirm your existing opinions. You help and support each other. From the

inside it can feel comforting. From the outside this bubble might look like common dreaming or shared illusions.

The basic idea of a swarm is that individuals lead to the emergence of a group which in turn constraints the actions of the individuals. The individuals are free to do what they want as long as they obey the constraints of the group. Holland calls this restricting influence from the group “constraint generating procedures” (Holland, 1998). In religion the restricting influence is visible in the imperative mood “Thou shalt not...” of the commandments. The swarm emerges as a result of opposing attractive and repulsive forces.

Depending how frequent the members come together and how strongly they stick to the rules, the collective organism can be tight or loose. A tightly coupled organism is like a dense swarm which is sharply isolated from the environment, while a loosely coupled organism is like a sparse swarm which hardly differs from the surrounding individuals.

According to Michele Gelfand, cultures can be located along this continuum from “tight” to “loose”, depending on the strictness of these rules. “Tight cultures”, she observes, “have strong social norms and little tolerance for deviance, while loose cultures have weak social norms and are highly permissive” (Gelfand, 2018).

These two extremes on the spectrum can be associated with rare and frequent gene expression:

- frequent gene expression: tight culture, strong bonds, isolated
- rare gene expression: loose culture, light bonds, open to environment

The collective organism remains stable if the forces are balanced, if the sacrifices of the members (in freedom, time, or money) to create a stable collective entity are not surpassing their benefits and returns from it. The subjective experiences of the individuals must confirm the underlying ideology.

SOCIAL ORGANISMS

COLLECTIVE ORGANISMS

In the last chapter we have discussed the existence of cultural genes and their effects. To sum it up one can say: the secret of organizations like the church are genes that are hidden in the commandments of holy books and scriptures. They are expressed in church services during the sermon of the priest. The organism that is created by this gene expression is the audience that forms a coherent community and a collective organism.

In terms of sociology, cultural genes are “social facts”. In sociology “social facts” are values and cultural norms that exercise social control and coercive power on individuals (Gilbert, 1989). It is a term defined by one of the founders, Emile Durkheim, who argued that the discipline of sociology should be understood as the empirical study of social facts. The effect of social facts is that they form social groups. For Margaret Gilbert collectivity is an essential characteristic of any social group. She argues that social groups are “plural subjects”:

“A set of people constitute a social group if and only if they constitute a plural subject [...] human beings constitute a collectivity (social group) if and only if each appropriately thinks of himself and the others as 'us' or 'we'” (Gilbert, 1989).

In other words social groups can be considered as collective actors where the individual actors share certain beliefs, attitudes or intentions. You can define such a collective organism as follows: a collective organism is a self-maintaining and self-replicating collective system which is generated and controlled continuously by the expression of genes. Let us take a look at the organisms that are created by them: how large can they become, how long do they live and what remains of them if they cease to exist?

If we consider a religious group over many generations as one single organism, where a new generation of members is just a replacement of cells, then

religious groups belong to the oldest groups we know. Individual members can be removed by death or added by birth, but the collective group stays the same, as long as the same genes are expressed. In this sense the collective organisms of the Christian religion are up to 2000 years old, and those of the Jewish religion even 2500-3500 years. This is far older than most biological organisms, although some trees can get quite old as well⁷. Each individual member has only a small lifespan, but the collective as a whole is very long-lived.

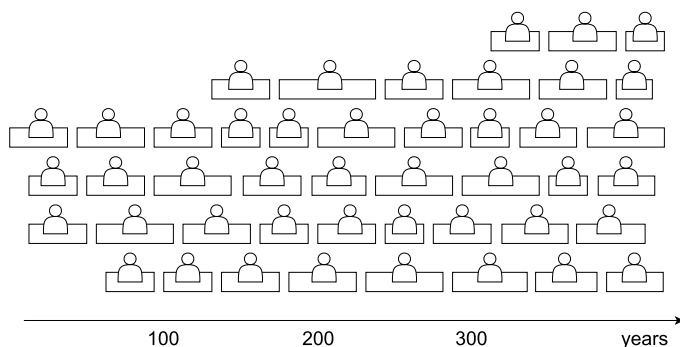
It is indeed impressive how large these organisms can become. The Catholic Church for example has 1.2 billion members and 400,000 priests worldwide. This is huge. While there might be local differences, all Catholic Christians believe in the same Bible, they follow the same pope, obey the same papal bulls and the same Code of Canon Law.

The protestant churches are also big, but more fragmented. In principle there is a giant organism consisting of 1.2 billion units, which is maintained by 400,000 caretakers. This sounds impressive unless we consider that a man himself consists of billions of cells. Apparently it is not a problem to create a gene-based organism which is made of billions of units. The members of these collective organisms often have the feeling of being part of something bigger than themselves. This is in fact true, since the individual member is in the end an exchangeable part of the collective community.

Collective organisms do not exist forever, although they can exist for thousands of years. It is remarkable to recognize that the churches which have promised us immortal life for so many millennia are themselves organisms. They can consist of billions of units, just like us. They can be born if they are founded by a prophet or a reformer, and they can be dissolved and come to an end, just like us. They are organisms based on genes which are generated and controlled by their genes, just like us, although they have a much larger life-

⁷ In China there is a 1400 year old Ginkgo tree, and some giant sequoia trees in California are even up to 3000 year old.

span than we do. An animal does not get much older than a century, but collective organisms can last much longer. They exist for millennia. The following picture illustrates this longevity:



Each rectangle represents the lifespan of a member, and the patchwork of rectangles looks a bit like the bark of a tree. What collective organisms and plants have in common are indeed the long life and the immobility, since they are rooted at a certain location. Temples and churches are not movable.

In this sense the promise of eternal life for believers has a true core, because collective organisms like the church last much longer than their individual members. By allowing us to take part in this longer and larger life, they allow us to last longer than our own short life. In principle there is no end to a collective life-form as long as it can find new members that maintain it. In practice a collective organism is a living organism which has a finite life-span, too. It disappears if it cannot find new members to replace old ones. This means any new existence as part of this larger life-form will vanish if this life-form disappears too.

Things that are believed to be eternal often turn out to be long-lived but finite. The ancient Egyptians believed astronomic objects like stars are eternal, but today we know that planets and stars have a finite life-span too. They typically exist for billions of years, but their existence is not endless. If the Earth is engulfed by a dying sun a few billion years from now, life in our Solar System

will come to an end unless it has found a way to remain in the inhabitable zone, for instance by settling on the outer planets or by leaving the Solar System.

If collective organisms cease to exist, they can lose the contact to reality. Gene expression can be so successful that the organism is generated although everybody realizes it is hollow and fake. This was the case in the late Soviet Union where propaganda, parades, slogans and rituals generated an empty hull that was completely transparent to normal citizens, because it was invisible and ineffective in daily life. The “fakeness” of propaganda was accepted by everyone as real. Alexei Yurchak calls this phenomenon when the propaganda bubble loses contact to reality *hypernormalization* (Yurchak, 2006).

The things that remain when the collective organism has ceased to exist are often the stony ruins of temples and cathedrals. Churches, temples and cathedrals are the hard outer shells that often remain as fossil witnesses of a glorious past, even if the life-form itself, the collective organism, has stopped to exist long ago. The temples of the ancient Greek, ancient Egyptians or the pyramids of the ancient Maya are like the fossil bones of dinosaurs stony relics of past life-forms.

The monumental buildings of fascists, communists and national socialists are nothing else. They are stony remains of former life-forms. The Buzludzha monument of the communists in Bulgaria is a stony relic of the communist party in the former Soviet Union. The Nazi party rally grounds in Nuremberg are a stony relic of the national socialist movement in Nazi Germany.

Religious groups in social systems are not the only collective organisms which are subject to evolution, although they have been among the first. In the course of time, other organisms and systems have developed from religious ideologies: political parties which based on party programs, nations which have written and unwritten laws, international corporations that have a corporate culture defined by manifestos, credos, principles, guidelines, etc. The large international companies are now more powerful and richer than the time-honored Catholic Church. Some can be big, powerful, and very durable, but

they don't exist forever. History tells us that all these collective organisms, organizations, companies, nations and parties have a beginning, a finite life, and an end.

At the beginning of a cultural organism or an ideological organization is the appearance of a prophet or founder. If he can convince enough persons to follow his movement and to become committed followers, he can be considered as the founder. The founder and the first followers are the cultural stem cell. In the case of a religious group this is the early and original church, from which more churches emerge through missions. The early church is a small group of committed people, a movement that follows a common idea. From a biological point of view, this is a cell, the original cell. Margaret Mead said “never doubt that a small group of committed people can change the world - in fact, this is the only way the world has ever been changed.”

If the group proves itself and is established as a part of society, the community house of the small group later becomes the place of worship, i.e. the temple, the church, the synagogue or the mosque. This is the first cell of the young collective organism. The cell membrane is the building of the church, and the cell nucleus with the genetic material corresponds to the sanctum or sacred place, in which, at least in Jewish synagogues, the Holy Scriptures are kept.

There is important and unimportant material in the genome, the genes correspond to the central commandments of the Holy Scriptures. As long as the basic commandments are preached regularly, the collective organism continues to exist. If they are not expressed anymore, and the group is no longer able to acquire new members, the organism comes to an end and is dissolved.

Therefore the most important task of the priests and presidents is to preach the central laws and commandments again and again. They are the rules that create collective organisms and allow them to exist, whether it is a religious group, political party, social movement or international corporation.

Between a religious group and a biological cell we have the following equivalence:

- Stem Cell \Leftrightarrow Early church
- Cell \Leftrightarrow Congregation, a group of committed people sharing the same ideas
- Cell division \Leftrightarrow Mission, founding of new congregations
- Cell Membrane \Leftrightarrow Church/Synagogue/Temple/Mosque
- Cell Nucleus \Leftrightarrow Sanctum which contains the Holy Scripture
- Genes \Leftrightarrow Central rules and commandments
- Gene Expression \Leftrightarrow Propaganda, reading of the Holy Scripture
- Gene Translation \Leftrightarrow Propagation of the Sermon
- Proteins \Leftrightarrow Concrete policies, code of conduct and behavior patterns

From this evolutionary point of view churches are a self-regenerating, living organism that consists of thousands or even millions of loosely coupled cells. The cell itself is just a single congregation. These organisms can grow immensely large and include billions of units. Ultimately, although the collective entity cannot exist without members, an individual person is an interchangeable building block in this community.

Within these organisms we are like atoms that can only perceive other atoms or molecules at best, but not the enormous life forms that are built up from them. While biological genes are so small that we can hardly see them, the creatures of cultural genes are so big that we can hardly understand them as a whole. We can give the organism as a whole a name, but we cannot perceive the actions and changes of these collective life forms directly in every detail, only occasionally in bits and pieces.

Collective organisms such as churches are organisms that based on genes, just like us. They are built, controlled and regulated by them, even if they are organisms of enormous size with a much longer life span that spans centuries and millennia. They have their own goals that are clearly different from ours and encoded in their genes.

It is important for these collective organisms to check their own principles and basic rules again and again if they are up-to-date and still fit to the environment, just as it is important for society to adapt the laws to current developments in order to remain innovative and efficient. Organisms that no longer fit to the environment perish.

In addition to religious organizations there are also economic and political organizations which have their own ideology and culture. All of these groups can be viewed as collective organisms, as long as they have a certain culture which is recorded in a codex, manifesto or set of basic principles. The codex and the propaganda for it are two essential parts of collective organisms

1. Codex, manifesto or ideology (a set of genes)
2. Regular sermon or propaganda (expression of genes)

The culture of a group, such as the corporate culture, is not just the traditional Christmas party where the whole company gathers. It is generally the behavior that is expected and rewarded, as well as behavior that is despised and punished. It is what makes members successful, for example principles like

- Work hard
- Be curious, inventive and resourceful
- Treat others with respect
- Help others
- Never stop learning
- Do everything for the customer
- Pay attention to quality
- Get to the bottom of things
- Think big
- Be goal-oriented & deliver results

The principles can vary depending on the group, party or company. Together they form the DNA of the group and define the behavior that is rewarded and punished. In general culture is the behavior in a group that is rewarded, for

examples selfless support of others. It arises when all successful members behave in the same or a similar way, for example by orienting themselves to the founders who behaved in a certain way.

If a collective organism has been created by founders, they become sacred for all members. One of the founders of sociology, Emile Durkheim, writes “we see society constantly creating sacred things out of ordinary ones. If it happens to fall in love with a man and if it thinks it has found in him the principal aspirations that move it, as well as the means of satisfying them, this man will be raised above the others and, as it were, deified. Opinion will invest him with a majesty exactly analogous to that protecting the gods. This is what has happened to so many sovereigns in whom their age had faith: if they were not made gods, they were at least regarded as direct representatives of the deity” (Durkheim, 1915).

Durkheim emphasizes that ideas can become sacred too for a social group, and these are in fact the basic principles that hold the group together. They are the cultural genes of the collective organism, and as such they are sacred: “In addition to men, society also consecrates things, especially ideas. If a belief is unanimously shared by a people, then, for the reason which we pointed out above, it is forbidden to touch it, that is to say, to deny it or to contest it. Now the prohibition of criticism is an interdiction like the others and proves the presence of something sacred” (Durkheim, 1915).

Can a large company or an international corporation exist without a code, codex, credo or corporate culture? Yes, but if there is no such thing then any large corporation risks that it loses its identity, falls apart and breaks apart. This is particularly noticeable in family businesses. Successful corporations apparently have a kind of codex or DNA to which the members submit.

Family-run private companies such as IKEA partly adopt the philosophy of the family or the founder. The founder's will can become the company's scripture, but it doesn't have to. Successful companies like IKEA, Apple or McDonalds sell products that are a brand and they are a brand themselves. A brand means a

name that is associated with certain characteristics in the perception of people, such as cheap and practical or luxurious and high-quality. It is a tool to distort the perceptions of people.

Such companies often have an innovative “concept” like inexpensive furniture that is assembled from the customers themselves, ideals like efficiency and a vision like “inexpensive furniture for everyone”. They have training centers where employees learn the “concept” and the ideals. Companies and organizations pursue their own goals, which differ from those of the employees.

Emile Durkheim clearly recognized this 100 years ago: “society also gives us the sensation of a perpetual dependence. Since it has a nature which is peculiar to itself and different from our individual nature, it pursues ends which are likewise special to it; but, as it cannot attain them except through our intermediacy, it imperiously demands our aid. It requires that, forgetful of our own interests, we make ourselves its servants, and it submits us to every sort of inconvenience, privation and sacrifice, without which social life would be impossible. It is because of this that at every instant we are obliged to submit ourselves to rules of conduct and of thought which we have neither made nor desired, and which are sometimes even contrary to our most fundamental inclinations and instincts” (Durkheim, 1915)

Although the biological genes were there before, the cultural genes are more abstract and general because they are not bound to a specific substance like biological molecules. Mental and physical life are not completely dissimilar. The essence of life is self-replication of information. Life is selfish and egoistic because it is based on selfish genes (Dawkins, 2016). In this sense life itself is evil.

There appears to be as much diversity among collective organisms in the social world as in the physical world among biological organisms, from countless small organisms at the bottom to fearful predators at the top of the food chain.

At the bottom the smallest organisms are countless clans and tribes, local groups of people who often have a common descent and who share a common place. On his quest to discover the original form of pure religion Durkheim examined clans and tribes in Australia and North America, and he argued that such clans are identified by a “totem”, a symbol or name unique for the group (Durkheim, 1915).

At the top of the organisms in the social world we can identify the big monotheistic world religions and international corporations which stretch across different nations and continents. They are like the Sauropods of the Jurassic, because they are simply the largest.

Predators in the biological world could be compared to criminal organizations such as a gang of thieves and pirates. Pirates violently rob other organisms of the resources they need to live (Lehr, 2019). Is this also a reason why we often show the same ambivalent mix of fear and fascination about pirates and gangsters like Al Capone that we have about big cats, carnivores and other predators?

IDEOLOGY & BUREAUCRACY

There is a wide range of collective organisms and cultural organizations, from small clans to giant international organizations. And it is a long way from a young, flexible ideology to an old, rigid bureaucracy which is shown for example in the history of the Social Democratic Party or the Catholic Church.

It took almost 2000 years from early Christianity in the first century to the dogmatically frozen Catholic Church in the 21st century. The Catholic Church itself is pure bureaucracy. One only has to think about the bureaucratic rules to prove miracles for canonization. A miracle is by definition something which cannot be explained or proved. In order to check if one of its deceased members is worthy of entering the official list of recognized saints, the Catholic Church has established bureaucratic rules that require to prove at least one miracle, before the person can be declared as a saint.

The same tendency towards bureaucracy can be observed in companies and parties of the old world, for example in century old German companies like Siemens or in old German parties like the Social Democrats. Almost 150 years have passed from the founding of the original Social Democratic Party in Germany in 1863 to the SPD of the 21st century, and today it has become frozen in bureaucracy.

According to Max Weber, one of the founders of sociology who has described the various forms of rule in detail, this is an example of a transition from charismatic rule to bureaucratic rule (Weber, 1978). He argued that bureaucracy constitutes the most efficient and rational way in which human activity can be organized. According to Weber bureaucracy is any system of administration which is conducted by trained officials that follow fixed rules carefully. He defines bureaucracy as “a means of transforming social action into rationally organized action.”

Organizations appear to have a general tendency to move from an ideology to a bureaucracy in the course of their existence. This could also be due to the fact that gene expression over the centuries has accumulated more and more fixed rules and regulations that contribute to the development of a bureaucracy. In the end the organization grows stiff in its own bureaucratic rules.

When a cultural genome has been completely expressed and none of the results is removed, then the system has become a total bureaucracy, because in this case there are written laws for every practical problem. If every imaginable problem of everyday life is covered already by a fixed rule how to respond, there is no need to express any new gene.

If the expression is complete, the religious aspect disappears. Max Weber says in “Economy and Society” that a rational bureaucracy does not like the irrational aspects of religion: “A bureaucracy is usually characterized by a profound disesteem of all irrational religion” (Weber, 1978).

Young collective organisms are often based on an initial ideology based on a small number of fixed principles and a high degree of flexibility. In addition to the small number of fixed rules there are a large number flexible rules and situation-dependent rules. Gene expression is of great importance to maintain these flexible rules.

Old collective organisms have a tendency towards rigid bureaucracies with a large number of fixed bureaucratic regulations which have little flexibility but enable efficient processing of information because the detailed rules already exist and do not have to be expressed. Gene expression is of less importance here because of the already hard-wired, unchangeable protein structure.

David Sloan Wilson writes that “senescence is still poorly understood from an evolutionary perspective in real organisms, much less churches” (Wilson, 2003). Apparently the rigidity of an inflexible bureaucracy is one element of senescence of large collective organisms like churches and political parties. It decreases adaptability and adaptiveness.

As an example we can consider for example the Social Democratic Parties of Europe. They still consider themselves as the parties of the working class although there are nearly no workers anymore in Europe. The manual labor jobs of the working class have moved to China, India and other Asian countries, but the Social Democratic Parties in Europe and the century old bureaucracy are unable to adapt themselves to this new situation.

Even science itself is evolving into a state towards a generic bureaucracy that produces empty research papers as Bruce Charlton has observed in his book named “Not even trying” (Charlton, 2012). Those who tried to write an application for EU funding will understand what he means. What is rewarded is often not truthfulness, rather mentioning the right people in the bureaucracy, pretending to make scientific progress, and creating consistent dishonesty to get the funding you need. Charlton argues that once the majority of peer reviewers were career-orientated professionals instead of truth seekers, the

whole system evolved into a giant bureaucracy that produces mostly fake research papers in many areas.

If a member is tied to an organization through strict contracts and if it is precisely regulated by written rules in an organization what everybody has to do, then the organization is already frozen in bureaucracy, and gene expression loses its importance. Written rules for every conceivable situation are already available and do not need to be created again for each new situation. The dynamic ideology has become a frozen bureaucratic entity.

To sum it up, one can say that the spectrum from ideology to bureaucracy describes the degree of expression.

- Ideology - basic rules fixed, detailed rules flexible and need to be expressed depending on the situation
- Bureaucracy - efficient but hard-wired rules on every level, everything is already expressed 100% in permanent form.

Bureaucracy can be seen as a frozen fossil of a once-living ideology. Before something is an established method, it is an art. And before something became a rigid bureaucracy, it was a flexible and shapeable ideology. Gene expression is particularly important when the collective organism is still young and the recipients of the message are shapeable and moldable by propaganda.

BRAIN WASHING & PROPAGANDA

Brain washing and propaganda are the two fundamental mechanisms how a collective organism is generated and maintained. They rely primarily on spreading information simply by speaking or broadcasting. As simple as this may sound, as powerful it can be. Communication and language may be trivial, but propaganda and persuasion are crucial factors for the creation of social systems.

In its basic form propaganda is uncomplicated. It means propagating highly charged opinions about something or someone. Successful propaganda for a person, party or product emphasizes the positive properties, achievements and success stories, while it keeps the failures, mistakes and negative properties secret. It highlights the positive aspects and stays silent about the negative ones.

In reality propaganda is more complicated. If propagandists or advertisers could reach their goal simply by telling the truth, there would be no real need for propaganda or advertisement. The objective of propaganda is not to spread the truth, but to persuade the audience. To reach their goals, they usually have to spread charged opinions and distortions of the truth such as lies, tricky deceptions and exaggerations. Philipp Taylor writes “an essential characteristic of propaganda is that it rarely tells the whole truth” (Taylor, 2003).

It is at the heart of advertising & advertising campaigns, public relations and marketing. The smallest single building block of propaganda for a product, person or party is an ad (or **advertisement**). A number of ads form an advertising **campaign**, a short-lived propaganda. Continuous or long-lived campaigns result in **propaganda**. The goal of propaganda is persuasion and manipulation of the public opinion. Taylor argues that “propaganda is the deliberate attempt to persuade people to think and behave in a desired way” by any desirable media, from inscriptions on monuments to modern mass media (Taylor, 2003).

The definition can be reduced to an even simpler definition, to the communication of ideas in order to persuade. O'Shaughnessy says that "Propaganda generally involves the unambiguous transmission of message" (O'Shaughnessy, 2004) It is the transmissions of a message for a persuasive purpose, as Taylor argues "Propaganda is simply a process by which an idea or an opinion is communicated to someone else for a specific persuasive purpose" (Taylor, 2003). In other words propaganda is a form of cultural gene expression.

Propaganda is essential for any large political movement, especially for totalitarian regimes like Nazism (O'Shaughnessy, 2016). The purpose of propaganda is the deliberate and systematic attempt to shape our cognitions and opinions, including all beliefs, desires and intentions, to achieve a behavior that supports the desired intentions of the propagandist. As Jacques Ellul has observed "Propaganda does not aim to elevate man, but to make him serve" (Ellul, 1973).

For PR and marketing experts that use propaganda it allows the manipulation of opinions. In the public it is exactly this feature that leads to the fear of manipulation without being aware of it. Marketing of products is generally accepted in modern societies because the scope is limited and we are aware of being manipulated.

Like all advertising and marketing propaganda can be effective if the manipulation works, and ineffective if the manipulation does not work. The effectiveness and impact of propaganda is difficult to predict, exactly like the impact of gene expression. The main thesis of this book is that both are the same. Edward Bernays, one of the inventors of PR says, "The mechanism by which ideas are disseminated on a large scale is propaganda" (Bernays, 1928). Propaganda is dissemination of ideas from cultural genes on a large scale.

We are vulnerable to the allure of propaganda and marketing because they use all tricks to influence our opinions, including psychological tricks like repeated use of simple slogans that represent the core values of the brand, or tricks that

appeal directly to the emotions that control us, or using brands and symbolism to fabricate myths that mislead us (O'Shaughnessy, 2004).

Jacques Ellul argues that propaganda only works if it satisfies a basic need of the individual to whom it is addressed: "The secret of propaganda success or failure is this: has it or has it not satisfied the unconscious need of the individual whom it addressed? No propaganda can have an effect unless it is needed, the need may not be expressed as such but remain unconscious" (Ellul, 1973).

These unconscious needs can for example be the desire to be great again. It can also be the desire to end the fear of death or to end the fear of threats by people of a certain minority, etc. Robert Paxton mentions the passions that are mobilized by propaganda in fascism and calls them "mobilizing passions" (Paxton, 2004). It does not matter if the passions are base or noble. Both can be used by propaganda to bypass our normal reasoning process in order to manipulate our behavior.

For Bernays propaganda is a normal process of propagating beliefs in any society: "Any society, whether it be social, religious or political, which is possessed of certain beliefs, and sets out to make them known, either by the spoken or written words, is practicing propaganda" (Bernays, 1928).

Since it is so normal, any organization, corporation or political entity can either seek to manipulate the public opinion or become their victim, according to Nicholas O'Shaughnessy (O'Shaughnessy, 2004).

Effective propaganda provides a carefully crafted perceptual lens. Through this lens we perceive a world in which a brand or organization shines in the brightest colors. We see a world as the advertiser wants us to see it, if he has successfully manipulated our perceptions and influenced our opinions.

The experts for public relations (PR), marketing and advertising in economy and politics know how to manipulate opinions without people even noticing it.

Bernays said “We are governed, our minds are molded, our tastes formed, our ideas suggested, largely by men we have never heard” (Bernays, 1928) .

Just because we freely participate in an event, see an advertisement or hear a speech does not mean that we are not manipulated by it. Quite the contrary, the willingness to listen enables the manipulation. In the extreme case we are exposed to pure propaganda and constant brain washing which remold our minds and reform our tastes completely.

We associate propaganda mainly with mass media, totalitarian systems and political movements such as fascism and Nazism. Propaganda minister Joseph Goebbels had a copy of Edward Bernays’ propaganda book in his book shelf. Bernays defines propaganda as PR (Public Relations) like this:

“Modern propaganda is a consistent, enduring effort to create or shape events to influence the relations of the public to an enterprise, idea or group.”
(Bernays, 1928).

According to Bernays propaganda includes the professional distortion of facts to manipulate the public opinion. It allows to form and influence people’s attitudes by deliberate manipulation. PR, marketing and advertising is the art of lying. The art is to bend the truth without breaking it, because lies are generally not accepted in a society.

In the case of a sect, propaganda takes the form of “brainwashing”. Brainwashing is a process that describes a re-education of people. You can poison someone emotionally through the power of words, as we know from ideologies, propaganda and sects. Sects and totalitarian political systems are known for their brainwashing, but they also exist in normal religions and political systems, only less extreme. How does this work and what is the difference between brainwashing in sects and propaganda for ideologies?

Brainwashing is nothing more than collective cultural gene expression in extreme form that changes the behavior of the individual in a way that fits to a certain worldview. We kind observe this kind of brainwashing on national

church days or party conventions as well, and also to a lesser extend in churches, synagogues, mosques and temples.

An ideology provides “glasses” for people, lenses through which they perceive the world in a certain form. The lens of ideology leads to a certain worldview, which then leads to actions that are compatible with this worldview.

The American psychology professor Margaret Singer describes brainwashing as a gradual social adaptation that is difficult to see from the outside. Important conditions are that the group leaves the members in ignorance of what is really going on, controls the environment and social interactions of the members, creates a feeling of powerlessness in them and sets up a system of reward and punishment. Singer names the following 6 steps and conditions which are typical for brainwashing (Singer, 2003)

1. Keep the person unaware of what is going on and how she or he is being changed a step at a time
2. Control the person's social and/or physical environment; especially control the person's time
3. Systematically create a sense of powerlessness in the person
4. Manipulate a system of rewards, punishments and experiences in such a way as to inhibit behavior that reflects the person's former social identity
5. Manipulate a system of rewards, punishments, and experiences in order to promote learning the group's ideology or belief system and group-approved behaviors
6. Put forth a closed system of logic and an authoritarian structure that permits no feedback and refuses to be modified except by leadership approval or executive order

All steps and conditions help to subordinate an individual to a group. The system of reward and punishment is especially interesting, because it is in essence the effect of the group's genes. The rules for reward and punishment are nothing more than the sect's genes. The reward and punishment rules from

the old genes are suppressed (point 4) while reward and punishment rules from the new genes are enhanced (point 5).

Psychologist Robert Lifton tried to formulate eight criteria of brainwashing after studying re-education camps in China and North Korea. Lifton's eight criteria which are also mentioned by Singer are the following points (Lifton, 1989):

1. **Milieu Control.** The first point involves the control of information and communication both within the environment and, ultimately, within the individual, resulting in a significant degree of isolation for the individual from society at large.
2. **Mystical Manipulation.** For the sake of ideology, people are deceived, deliberately misinformed and systematically lied to. The leader, party or organization is given a mystical aura. Experiences are manipulated in a planned and orchestrated way by the group or its leaders in order to demonstrate divine authority or insight that sets the leader and/or group apart from humanity, and that allows reinterpretation of historical events or scriptures. Coincidences are interpreted as omens or prophecies.
3. **Demand for Purity.** The world is viewed in radical extremes as black and white, good and evil, pure and impure, and the members are constantly forced to conform to the demand for purity of the group and to strive for perfection.
4. **Confession.** Sins, as defined by the group, are to be confessed either to a personal monitor or publicly to the group. There is no confidentiality; "sins", "attitudes", and "faults" of the members are discussed and exploited by the leaders. The induction of guilt and/or shame is used as a powerful control device.
5. **Sacred Science.** The group's doctrine or ideology is considered to be the ultimate truth, beyond all questioning or dispute. Truth and redemption are not to be found outside the group. The leader, as the

- spokesperson for God or for all humanity, is likewise above criticism. Totalitarian systems give their fundamental dogma a sacred status
6. **Loading the Language.** The group interprets or uses words and phrases in new ways so that often the outside world does not understand. This jargon consists of thought-terminating clichés, which serve to alter members' thought processes to conform to the group's way of thinking. Old terms are reinterpreted, reassigned and redefined so that they are in line with the ideology's worldview.
 7. **Doctrine over person.** Members' personal experiences are subordinated to the sacred science and any contrary experiences must be denied or reinterpreted to fit the ideology of the group.
 8. **Dispensing of existence.** The group has the prerogative to decide who has the right to exist and who does not. This is usually not literal but means that those in the outside world are not saved, unenlightened, unconscious and they must be converted to the group's ideology. If they do not join the group or are critical of the group, then they must be rejected by the members. Thus, the outside world loses all credibility. In conjunction, should any member leave the group, he or she must be rejected also.

If four or more criteria are fulfilled, then we can say it is a brainwashing process, according to Lifton. The transition from no brainwashing at all to total brainwashing is fluent.

There is a strict dichotomy in the division of religious organizations: sects are bad, churches are good. Sects practice brainwashing, churches improve society. Sects produce terrorists, churches produce better people.

In my opinion it is a fundamental mistake to believe that there is brainwashing in sects, but not in official churches. Brainwashing in the official church is only socially accepted and less radical. Sects are smaller, more extreme and more radical, but the way they work is similar. Moreover sects can often be found in the formation of new religious groups. They are a kind of a religious startup.

The brainwashing process is fundamentally important, even in larger groups, because it is precisely the basic basal process that builds the community through the expression of genes. Brainwashing favors certain behaviors and suppresses others by imposing a worldview on the members which is specific to the ideology of the group. Inappropriate thoughts are washed away, as the name suggests, while useful thoughts are built up with the help of opinions, emotions, and manipulations. The end result is a specially shaped worldview that is manipulated until it is compatible with the desired ideology. Advertising and marketing also use related methods to manipulate opinions.

Ultimately, everything we perceive and do affects our thinking and shapes us as a person. Everything we hear in speeches and sermons forms our beliefs and gives us in the end instructions for actions, whether it is the Christmas speech of the Federal President, the keynote speech by the party chairman or the sermon of the archbishop. Party propaganda is as much brainwashing as church sermons. This kind of propaganda is not used against the will of the target audience. In both cases, the point is to convey a worldview that glorifies a certain ideological system. Everything is viewed in the light of this system, the positive sides of the system are exaggerated, while other systems are sharply criticized and critical information is suppressed.

In extreme cases we have totalitarian propaganda of communists or Nazis, which shapes and defines the world view of the people who have to listen to fanatical speeches of politicians and ubiquitous radio broadcasts. It becomes problematic when ideologies become radical and when the focus is no longer on people. Then we can find violence and indoctrination in which no contradiction or discussion is permitted.

Today, the ubiquitous propaganda of the Nazi party in Nazi Germany or the communist party in the former Soviet Union have disappeared and can only be seen in a weakened form at election campaign times. Instead, people are systematically bombarded on all sides with colorful advertisements for economic products and advertisements for all sorts of products and systems. Furthermore, you can get information on the Internet at any time about any

kind of absurd topic so that both the major popular parties and the popular religions have lost their importance. In the flood of information it is sometimes difficult to keep an overview.

Just as it is a mistake to believe that there is brainwashing in sects, but not in larger churches, it is a mistake to believe that we have propaganda in totalitarian states like North Korea but not in capitalistic states. One could say that in totalitarian states there is mainly propaganda but no advertising, while in capitalist states there is mainly advertising but no propaganda. Both are closely related, as Edward Bernays noticed (Bernays, 1928).

Propaganda in its extreme totalitarian form can be seen as a comprehensive form of political advertising, where the ideology is extended to all parts of society. Advertising, in turn, can be described as propaganda for a specific product for a limited amount of time. Advertising and propaganda are still ubiquitous today around the world. David Myers writes in his book "Social Psychology": "Our opinions have to come from somewhere. Persuasion - whether it be education or propaganda - is therefore inevitable. Indeed, persuasion is everywhere - at the heart of politics, marketing, courtship, parenting, negotiation, evangelism, and courtroom decision making" (Myers, 2012). They make life colorful, but they also distort reality. Appeals are made directly to feelings and instincts to influence behavior, just as demagogues do. Economic advertising, military speeches, political speeches, and religious sermons, when effective, cause psychological manipulation of people and subtle control of thought. We are manipulated by companies with all psychological tricks to buy and consume their products, just as religions and parties try everything to win new members. They all know how to sell themselves. If we define marketing in general as the art of selling something, then it includes design (the art of making something look good), propaganda (the art of spreading highly charged opinion), advertising (a marketing tactic that involves an openly sponsored message to promote a product, service or idea) and PR. Marketing is the art of making something successful in the market, whether it is a product, person or party. If we are vicious we could

define it as the art of lying, because in order to reach the goal of making something successful in the market we are often manipulated, misinformed, misled, deceived and brainwashed so that we are convinced to follow that leader, to join that group or to buy that product.

GENE PUPPETS

Collective organisms can overlap and collide. The overlapping areas are the place where it gets interesting, because at the place where different collective organisms overlap the individuals are subject to different, sometimes contradicting influences. In these areas individuals are like puppets which are controlled by multiple strings from different directions. The interesting things happen when the strings pull in different directions or get entangled.

In his classic book “The Selfish Gene” Richard Dawkins has argued that biological organisms are disposable vehicle of their selfish genes (Dawkins, 1976). According to this gene-centered perspective, all biological organisms are string puppets of their genes, which are no longer needed as soon as they have fulfilled the task of self-reproduction. Reality is a bit more complex.

Humans are more than just string puppets and disposable vehicles of our genes. Man is both a biological being and a cultural creature. As Edward O. Wilson describes in his book (Wilson, 2013), there is a constant conflict between the two drivers that control us as humans: as individuals we are selfish and egoistic, but as members of a larger group we prefer selfless and selfless behavior.

According to Durkheim (Durkheim, 1915), every religion is based on the duality of mortal shell and immortal soul, of body and mind. This is the mind-body duality already Descartes recognized (Carriero, 2009). This duality - Durkheim speaks of two different natures - is in fact based on two different codes. We know the existence of the genetic code for biological organisms, and have argued in the last chapters that there is at least one other code responsible to build collective, social organisms. Thus we have indeed multiple codes, and each of them is able to build different organisms.

We are string puppets of our genes, but at the same time we are also string puppets of all the other genes that affect us. We are more like a modern car-sharing car that many different users want to share at the same time than a “throw-away vehicle” of a single user. And these different users have different interests and want to steer the vehicle in different directions.

If we remain in the image of the string puppet controlled by several owners, then we can identify strings from several different directions, from the biological, organic direction, from the religious, ideological, political, economic direction, etc. The strings mean the effect of the genes which act in general by propagating their information: for cultural genes by brain washing and propaganda. All of these genes pull on their puppets to guide them in the desired direction, and every set of selfish genes wants to use the puppet for a different purpose.

If the string says "stop - do not go there", then the taboo area begins. This is the taboo area where the central rules of the genes are broken. For the religious genes, that's the realm of sin, because for the church, breaking the fundamental commandments - you shouldn't steal, lie, kill, etc. - is sin. Interestingly the ultimate sin for one set of selfish genes is the ultimate goal for another set of selfish genes.

Lying, for example, is good from the biological, selfish genes perspective if it gives the individual an advantage. It is bad for the cultural, religious genes because it destroys trust between people. Adultery and theft are similar. From the perspective genes of the selfish biological genes, both are good because they increase the chance of the individual to replicate itself. The ultimate goal is self-replication. From a cultural genes point of view, it is certainly bad because it deprives other group members and promotes group conflict.

In other words: what is good from the point of view of one set of genes is bad from the point of view of another set of genes and vice versa. They are in constant conflict with each other. Good and bad become relative terms.

Biological genes want us as biological organisms to follow the biological imperative, i.e. **eat!** and **mate!** This can be observed well in every nature documentary, because whenever something interesting happens, it is either mealtime or mating season.

Cultural genes of an ideology want us as cultural beings to **love!** the group. In practice this means following the group and obeying the Golden Rule (“Treat others as you would like others to treat you”). And they encourage to **evangelize!** in order to win new members.

For a party it is similar, especially for parties which are based on a coherent ideology or on a religion itself. From all social organizations, political ideologies are most similar to religious groups. Party members should **love!** the party and try to win new members & voters whenever possible. This means to **evangelize!** for the party on every occasion.

For an international corporation or large company it is obvious that the corporation wants the employees to do nothing else than **work!** The perfect employee is always keeping an eye on the principles of the company, the credo and the company philosophy, and he or she works day and night to make the company successful. In the best case an employee sacrifices his life for it, thus securing the existence of the company and increasing its assets.

Humans are at the intersection where all these strings and cords end and the different genes meet. A man is sometimes pulled in one direction, sometimes in the other. The German poet Johann Wolfgang von Goethe describes this as follows in his novel “Faust”:

“Two souls, alas, are housed within my breast,
And each will wrestle for the mastery there”

If one set of gene wins in this conflict, then all other genes that want something else obviously lose. For example from the point of view of selfish biological genes, killing other beings is acceptable in order to survive. This is what

predators like sharks and big cats do in nature. Killing other persons in social systems is a capital crime and major sin.

Rape and **murder** is acceptable for selfish biological genes too because it is in line with the primary directive to mate as much as possible to ensure successful reproduction. Rape allows selfish genes to replicate themselves, and predators in nature have to kill prey (other animals) to survive. From a cultural genes perspective, both is of course absolutely unacceptable. Murder violates one of the Ten Commandments and is a capital crime in society. In religion and society rape is considered as a sin because it violates elementary social rules, especially the Golden Rule “Do to others what you want them to do to you” (Matthew 7:12 and Luke 6:31) and the rule to “Love your neighbor as yourself” (Leviticus 19:18, Matthew 22:39, Mark 12:31, etc.). The same thing that is a sin for culture and religion, i.e. a violation of the basic moral rules and divine commandments, can be a fulfillment of the primary commandments for biological organisms. Violating one set of genes can make another set of genes happy, and vice versa.

Celibacy and **martyrdom** are the reverse cases. From the point of view of the cultural genes, selflessness, martyrdom and celibacy are good, because they allow the individual to concentrate entirely on the replication and reproduction of the cultural genes, even if the individual has to sacrifice the one life or the own descendants for it. The New Testament recommends it in Matthew 19:12 for “the sake of the kingdom of heaven”. Monks and bishops in the Middle Ages for instance could focus entirely on the duplication and interpretation of Bible texts, even if they were not very successful in duplicating their own genes. Another benefit of Celibacy for the church is that the riches of the church do not become heritable by the sons of the Popes. However failing to replicate the own biological genes is of course a major violation of the primary directive from the point of view of the biological genes, since the primary directive is to mate in order to replicate the genes. The hero and saint for one set of genes can be the sinner and traitor for another set of genes. For their own biological genes, individuals who obey celibacy are losers, traitors and sinners,

because they are guilty of breaking the primary directive, the main no. 1 rules to survive, mate and replicate.

These elementary conflicts between different sets of genes can be observed in the ambivalent area where different organisms overlap. If one set of genes loses wins absolutely we have clearly a winner. The central concept in religion for this process is salvation. This is associated with liberation and redemption. Salvation means the goal of liberating the individual and humanity as a whole from everything negative. As we have seen, positive and negative as well as good and bad must always be interpreted relative to the respective reference system. Each set of genes defines an own reference system.

If we stay in the picture of string puppets which have several puppet players, one could say each puppet player has different strings which pull in different directions. Salvation means that a new puppet player will be added who will release the puppet from the old rules, and eventually takes over the control completely. The puppet is not only dependent on one puppet player anymore, but on multiple ones. The cultural genes limit the effect of the biological genes or render them ineffective by “overwriting” certain rules. In extreme cases such as celibacy, this can mean that the threads are completely cut off or torn off by another puppet player.

There can also be agreements and resonances between different puppet players, whenever two or more puppet players pull in the same direction. This can be realized for example by wrapping an idea in a feeling or a feeling in an idea. When the beautiful idea that God saves us from sins and gives us eternal life is wrapped in a comforting feeling of security, religious and biological genes pull together because the drive to survive is undoubtedly the greatest desire of all organisms and life forms. It is like a mutual insurance of existence between two different systems where both sides benefit. The individual promises to join the group and contributes to its existence, while the group promises to ensure the existence of the individual.

In any case, we as humans are at the center of all the different genes and systems that want to guide and use us for their purposes. We are located between different worlds and systems. Erich Fromm says this nature of man leads to an inherent existential contradiction:

“Man is confronted with the frightening conflict of being the prisoner of nature, yet being free in his thoughts; being a part of nature, and yet to be as it were a freak of nature: being neither here nor there. Human self-awareness has made a man a stranger in the world, separate, lonely, and frightened” (Fromm, 1964).

As human beings, we find ourselves in the middle between all of these systems and organizational forms such as churches, companies, the media, banks, parties and sports clubs. Each system - biological, political, economical - lives in its own world and creates its own reality. Each of these systems has its own rules and its own set of genes and code of laws that affect “the puppets” in different ways. Thus we exist in several worlds and systems at the same time due to the diverse roles we play in society, although there is only one physical reality in which we exist only once. Life is like a puppet theatre where the puppet players alternate. In the religious congregation we are the congregant; at the workplace of the employer we are the employee, at home we are the family person. Each of these systems corresponds to a different social self.

MIND AND BODY

A lot has been written in the last centuries about minds and bodies and their relationship (McGinn, 1997). The relationship is indeed difficult to understand. One major problem is mental causation (Dardis, 2008): if a mind is different from the real world, how can a mind exercise causal powers in a world that is fundamentally physical? (Kim, 1998) Another problem is if there is a mind and a body, how does the mind arise from the body? And how is the soul related to social systems and society as a whole?

Well, we ask how the mental is connected to the physical, although the mind is simply what the brain does, and the brain consists of nothing but connections:

it has billions and billions of connections. We ask how the mental arises from the physical, although each of us spends 18 years of learning, where we do nothing else but creating, forming and remembering mental structures. During this time of continuous growth, physical and mental structures are built up simultaneously. Body and mind develop together, until we have a mind in the body and a body in the mind (Johnson, 1987).

Descartes writes in his “Meditations on First Philosophy” that body and mind form a unit: “there is nothing that my own nature teaches me more vividly than that I have a body, and that when I feel pain there is something wrong with the body [...] Nature also teaches me [...] that I am not merely present in my body as a sailor is present in a ship, but that I am very closely joined and, as it were, intermingled with it, so that I and my body form a unit.” (Descartes, 1988).

In their book “The Self and Its Brain”, Karl Popper and John Eccles argue that the classic mind-body problem becomes clearer if we do not view the brain as a single entity, but as a complex world itself, for example if we introduce as they suggest a “tripartite” division in 3 distinct worlds: first the physical world where the **body** is located, second the world of mental states at the lowest level of the brain which includes direct representations of the **body in the mind** and all physical objects, and third the world of the **mind in the body** at more abstract, higher levels of the brain (the symbolic level of thoughts, stories, ideas, etc) (Popper, et al., 1977)

Words which correspond to physical objects can be understood by a direct connection of world 1 and world 2. Metaphors are used to understand all abstract ideas of world 3 which have no direct connection to world 1. The body in the mind is in fact the basis of all reasoning, meaning and imagination (Lakoff, et al., 1980).

One of these ideas in world 3 is the product of self-consciousness and self-awareness, the idea of the self or soul which remains mysterious because it creates a strange chaos in world 2. Daniel Dennett argues this mysteriousness

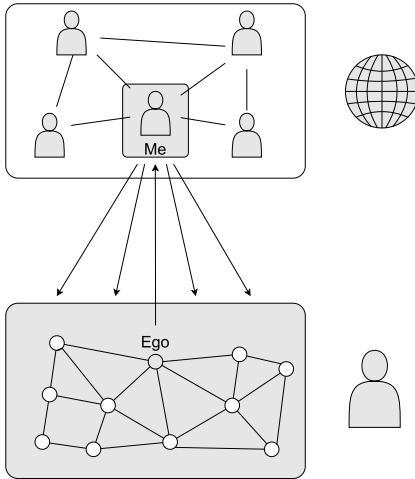
could be a defining feature: “The very mysteriousness of consciousness is one of its central features. Possibly even a vital feature.” (Dennett, 1991)

Consciousness is confusing because the 'I' which considers the 'me' in the consciousness of the self is both a thought, and the whole body. It is a kind of insight in confusion. William James writes:

“The consciousness of Self involves a stream of thought, each part of which as 'I' can remember those which went before, and know the things they knew; and emphasize and care paramountly for certain ones among them as 'me', and appropriate to these the rest. The nucleus of the 'me' is always the bodily existence felt to be present at the time. [...] This me is an empirical aggregate of things objectively known. The I which knows them cannot itself be an aggregate, neither for psychological purposes need it be considered to be an unchanging metaphysical entity like the Soul, or a principle like the pure Ego, viewed as 'out of time.' It is a Thought, at each moment different from that of the last moment, but appropriative of the latter, together with all that the latter called its own. All the experiential facts find their place in this description, unencumbered with any hypothesis save that of the existence of passing thoughts or states of mind” (James, 1890).

Nevertheless there clearly is a duality of body and mind. The duality of body and mind which Descartes recognized (Carriero, 2009) is based on the fact that we as humans are located at the intersection of at least two different evolutionary systems, and each system has its own sort of genes. One could describe this intersection point as a nexus, vertex or junction. It is a place where different systems meet. This intersection allows us to move partially and temporarily from one system to another, and to recognize ourselves as part of another system. Ultimately it leads to all the interesting phenomena such as emergence, transcendence and self-consciousness.

According to Descartes we have a soul because we are thinking. Descartes is famous for his phrase “Cogito, ergo sum” which means “I think, therefore I



am”. He writes in the 2nd chapter of his “Meditations” that humans are thinking things:

“I am therefore, precisely speaking, only a thinking thing, that is, a mind (*mens sive animus*), understanding, or reason, terms whose signification was before unknown to me. I am, however, a real thing, and really existent; but what thing? The answer was a thinking thing” (Carriero, 2009)

And yet since Daniel Dennett and Gilbert Ryle we know that it is not

the soul which is the actor behind the thinking, at least if we think of it as some form of knowing self. Gilbert Ryle argues: “Should I, or should I not, put my knowing self on my list of the sorts of things that I can have knowledge of? If I say ‘no’, it seems to reduce my knowing self to a theoretically infertile mystery, yet if I say ‘yes’, it seems to reduce the fishing-net to one of the fishes which it itself catches” (Ryle, 1949).

In the outer world the “Ego”, the conscious thinking subject, shrinks to an insignificant speck of dust among countless others, while the “Me” from the outer world expands in the own consciousness to the whole inner universe. How can a speck of dust equal a universe, and how can the fishing net be reduced to one of the fishes it catches? This is the reason why consciousness remains confusing and mysterious, although it offers us the most fundamental insight: the awareness of the own existence.

Using the words of Jean-Paul Sartre, we can say that the emergence of consciousness is possible by “The Transcendence of the Ego” (Sartre, 1957). In his first book which carries this name Sartre argues that the Ego is not an

inhabitant of consciousness, neither formally or materially. The Ego would be outside, in the world instead. He says “The ego is not the owner of consciousness; it is the object of consciousness” (Sartre, 1957).

Humans are complicated. We know that the immaterial essence or animating principle of life is just the genetic code and the molecular machines that execute it. The fundamental particles of biological organisms are atoms and organic molecules. What are the fundamental particles of social organisms?

If we have different genetic codes, we have more than one animating principle, more than one puppet player. What is the knowing self or soul in this picture? Is it an illusion? Descartes says it is a thinking thing. Ryle says it is a fish we cannot catch. Let us step one step back to see the bigger picture. Even if the single fish is hard to catch and difficult to define, we can hardly ignore the swarm. And we can define the fish as the elementary particle of this swarm.

We can define the soul as a social self as follows: *a soul is the fundamental particle of a social organism which emerges at the intersection of different evolutionary systems.* Strangely the fundamental particle itself is not directly defined by the genes themselves, although it is elementary. It arises from their interaction at the intersection. It is the joint effect of more than one puppet player. The biological genes determine the physical appearance of the body and its ability to act. The cultural genes determine the mental properties of the mind, the preferred behavior patterns and the direction in which it moves. All souls or social selves together form the social organism, and a soul itself is the smallest building block of such a collective entity.

William James writes in “The Principles of Psychology” that everybody has as many different social selves as there are distinct groups of persons who recognize him: “a man has as many social selves as there are individuals who recognize him and carry an image of him in their mind [...] But as the individuals who carry the images fall naturally into classes, we may practically say that he has as many different social selves as there are distinct groups of persons about whose opinion he cares” (James, 1890).

At the most basic level in fundamental particle physics we have elementary particles and vertices where they interact. In social systems the fundamental particles seem to emerge at vertices. The thinking thing from Descartes is a thinking thing (a man) on top of a moving thing (an animal). The thinking thing is the sum of all behavior patterns created by non-biological genes on top of an organism created by biological genes.

Instead of asking what the substance is that the soul is made of we should ask what the substance is that social organisms are made of. In this sense we can say a soul is an agent or actor in a social system which is part of a larger organization, a fundamental social particle which emerges at an intersection of different evolutionary systems. Or maybe it would be more precise to say the soul is a shadow of a fundamental social particle, because as a selfish biological organism it can be only an approximation of an ideal social actor.

The soul is what makes a person unique. It is related to the character, the identity and personality of a person. A real personality or a strong character can only be created by constantly learning, memorizing and practicing behaviors, just as a social character is created by ongoing socialization. The personality is based on the learned behavior patterns which are formed and shaped by the cultural genes in the community where we live. It is the brain-washed character that results from listening to the propaganda of the ideology.

George H. Mead says in chapter 20 of his book “Mind, Self, and Society” that “A person is a personality because he belongs to a community, because he takes over the institutions of that community into his own conduct. He takes its language as a medium by which he gets his personality [...] There are certain common responses which each individual has toward certain common things, and in so far as those common responses are awakened in the individual when he is affecting other persons he arouses his own self. The structure, then, on which the self is built, is this response which is common to all, for one has to be a member of a community to be a self.” (Mead, 1934).

And in chapter 26 he adds that all these different social selves are created by a social process, and argued that each self would be an individual reflections of this creative process: “The fact that all selves are constituted by or in terms of the social process, and are individual reflections of it [...] is not in the least incompatible with, [...] the fact that every individual self has its own peculiar individuality, its own unique pattern; because each individual self within that process, while it reflects in its organized structure the behavior pattern of that process as a whole, does so from its own particular and unique standpoint within that process, and thus reflects in its organized structure a different aspect or perspective of this whole social behavior pattern from that which is reflected in the organized structure of any other individual self within that process” (Mead, 1934).

Historically, teachers, writers and other cultural works have been considered as the engineers of the soul. Victor Klemperer claimed that Lenin said teachers would be the engineers of the soul (Klemperer, 1947), and Joseph Stalin used the term “engineers of the soul” for writers and other cultural workers (Westerman, 2010).

Animals do not have teachers or writers, because they do not have the capability to use and understand abstract symbolic language. They only follow their emotions and instincts. Our name is at the core of our identity, and a name alone can be considered as immortal. It can be remembered or forgotten, burnt or extinguished, but as an abstract sequence of characters it cannot be destroyed by destroying a single instance. As long as the name is mentioned at least once somewhere it is not completely eliminated. It is the focal point of self-awareness and an identifying feature.

Our name is the personal brand of our personality. The actual character is more than a name. It is a bundle of behaviors, behavior patterns, habits and rules that are characteristic of a particular person. At the same time, it can also be a bundle of common principles and ideas that connects individuals in a family or organization. The soul is therefore at a node or vertex of different evolutionary systems.

A priest would say the soul is a part of God, i.e. a drop from the essence of God if the essence was liquid, or a breath of the substance of God if the substance was gaseous, which the ancient Greek noun *psyche* (ψυχή) assumed. *Psyche* means both butterfly and soul in ancient Greek. The mind is not only connected to the soul, it goes back to the same word. You could say that the stuff that people are made of is a combination of properties, a bundle of behaviors and habits that has grown and developed over time. What we repeatedly do determines who we are. As Aristotle says "We are what we repeatedly do. Excellence is therefore not an action, but a habit". The soul is the character of a human being as part of the group.

A sports team can also have a soul, the famous team spirit. Team spirit makes it easier for the group to stick together in difficult times. It is usually identified with the willingness to help others who have made mistakes or to support team members in difficult situations.

Based on the previous chapter, the soul or social self could be seen as the sum of all behavior patterns created by non-biological, cultural genes. For example the sum of all internalized Christian behaviors (such as "you should love your neighbor as yourself") makes someone a Christian. The sum of the German language skills and the internalized rules of German culture (such as "you should drink apple spritzer", "you should eat potatoes" or "you should wash and honor your car") make e.g. someone to a German. As a German Christian, you have internalized all the rules of the two behavioral complexes concerned (such as "you should eat potatoes and share them with your neighbor"), and together with the other learned and appropriated behaviors, they form the personality.

According to the church father Saint Augustine (354-430) "love is the beauty of the soul"⁸. If there are many "good" behavior patterns related to love,

⁸ The full quote can be found in his work "Ten Homilies on the First Epistle of John" and reads "Beauty grows in you to the extent that love grows, because love is the beauty of the soul" ("Quantum in te crescit amor, tantum crescit pulchritudo; quia ipsa caritas est animae pulchritudo").

honesty and other virtues, then we can describe the soul as beautiful. In this context “good” is a measure of much the behavior of the individual benefits the group and fits to its goals. This means if a person lacks love and is arrogant, vain and selfish, then he has an ugly, repulsive personality. If, on the other hand, he has friendly, charming and adorable qualities, this indicates an attractive personality.

CULTURAL EVOLUTION

David Sloan Wilson takes in his book “Darwin's Cathedral” the first real steps to join evolution and religion. The key is to think of society as an organism and to view religious groups as adaptive units in their particular environments:

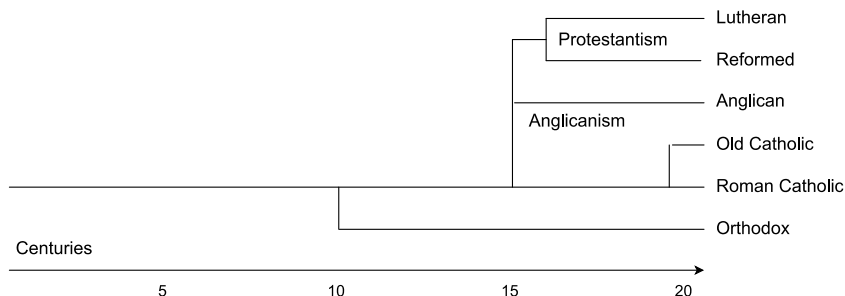
“Many resources and other valuable commodities can be achieved only by coordinated action of individuals. When members of a social group act in such a fashion, they function as an adaptive unit. Human groups function as adaptive humans primarily by having a moral system regulates behavior within the group. Moral systems are frequently expressed in religious terms. Many features of religion [...] can be explained as adaptations designed to enable human groups to function as adaptive units.” (Wilson, 2003).

The thesis of this book is to go one step further and identify the genes that create these adaptive units. As we have argued in the last chapters, cultural genes and their products, religious & ideological groups, are in fact like biological genes subject to evolution. It is a bit paradox that religions have remained hostile towards evolution, although evolution is the real key to understand it. Many people reject evolution, despite the evidence for it and its enormous explanatory power (Kampourakis, 2014). Or is it the real reason for the fierce hostility?

The Jewish religion exists for more than 3000 years, the Christian religion for more than 2000 years, and both have changed themselves multiple times (Wright, 2010). Religions change, adapt and renew themselves because they want to fit to a changing environment. Unless they insist that nothing should be changed and everyone should stick to their traditional ideas and values. The Roman Catholic Church is a good example for a very conservative religion.

Religions are like biological species in a constant competition. They become popular or can be forgotten, they appear and disappear again, and they can go extinct too. Wilson used the example of Calvinism that successful religious groups are adapted to their local environment (Wilson, 2003)

They can split into different branches which also can merge again. New branches appear and old branches can disappear. At the junction or branching points we can usually find a prophet or reformer who has created or founded a new branch. A simple phylogenetic tree for the two millennia of Christian religions looks like this:



It is a bit simplistic because it contains only the biggest denominations. It does not contain many smaller movements like the Seventh-day Adventist Church which branched of the Millerite movement etc. While all Christian religions are based on the same holy book, the Bible, they are major differences between them which are most visible in the interpretation and in the additional systems of laws. In addition to the Bible, the Catholic church has developed a “canon law”, a system of laws and legal principles. The canon law of the Catholic Church is named “Codex Iuris Canonici”. It is the precursor and ancestor of the modern civil law legal system. The eastern and orthodox churches use a different canon law, while the protestant churches do not use them.

The **prophet** or reformer is a person who creates a new branch, while a **priest** maintains an existing one. Like a founder of a company, a successful prophet is able to foresee the future. Often he has a vision of a better world, a vision of a better society, or simply a vision of a religious group. In this sense a successful prophet makes a self-fulfilling prophecy, because he helps to create it, as if he would have a virtual time machine that allows him to view the future and apply this knowledge to the current moment.

Startup founders must have a convincing vision too. They must have a vision of a successful company that they would like to found. They can realize this vision if they get enough venture capital that allows them to tunnel through hard times where they do not have enough revenue.

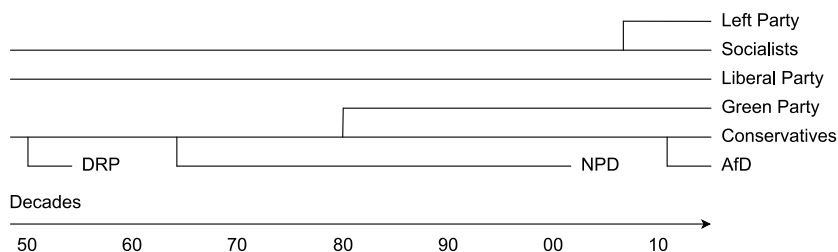
For political parties it is not different. Like religions, “parties are groupings of people with similar beliefs, attitudes and values” (Ware, 1995). And just as founders of religious groups and economic companies, founders of political parties have a vision. For instance the founders of the Green Party had the vision of a peaceful world where nature is protected and conserved peacefully. This vision became the core of an ideology and the backbone of the party. The ideology itself is based on a bundle of political policies. For the Green Party we have a policy of conservation to protect the nature in a peaceful way.

The emergence of democracy and democratic states created the landscape of political policies where political parties can exist. Political parties are located in the political spectrum of this landscape. For example conservative parties have a policy of conservation and discipline to protect the existing culture. Socialist parties have a policy of redistribution to reduce injustice and inequalities. Liberal parties have a policy of freedom, which means paradoxically a policy of reducing policies.

Alan Ware defined a political party as “an institution that (a) seeks influence in a state, often by attempting to occupy positions in government, and (b) usually consists of more than a single interest in the society and so to some degree attempts to 'aggregate interests'” and argues that “Parties are institutions that seek to represent more than a single, narrow interest in the society”. (Ware, 1995).

The early monotheistic religions were like totalitarian parties in single-party states which claim to represent the total interests of society. This is the reason why radical political parties and religious ideologies can merge into a single entity. We will discuss this topic in detail in the next chapters.

The phylogenetic tree for the political parties in Germany after WWII looks like this: at the top we see how the far-left party branches off the socialists (the social democratic party), and at the bottom you see several unsuccessful attempts to split a far-right party from the conservative party. The attempts are unsuccessful because the niche on the far-right spectrum has been destroyed by Nazism in WWII. The Green Party in Germany was founded in 1980.



Many patterns in nature show a branching form, as Philip Ball has explained (Ball, 2011). In both cases above the branches are the results of an evolutionary system. Political parties which are based on an ideology are very similar to religions. They are based on an abstract ideology and produce basically nothing but themselves, i.e. they sell themselves to win new members and voters.

To found a religion prophets must win followers, and to do that they propose laws for a new, better world which has less injustice. They are the founders and lawmakers of religions. In this sense they are like the founders of companies, corporations or international organizations.

For Protestantism the major reformers are named Martin Luther (1483-1546), Ulrich Zwingli (1484-1531), and Johannes Calvin (1509-1564). For Christianity itself which has split from the Jewish religion about 2000 years ago we can find of course Jesus and St. Paul as the prophets, and the Roman emperors Constantine the Great (272-337) and Theodosius the Great (347-395) which have turned the early Christianity into a unified state religion.

The essential elements to create a religion and to keep it alive are therefore:

- **Prophets & Reformers**, who propose rules for the *creation* of a new community which are also the core of a new holy script
- **Priests & Teachers**, who care for the *maintenance* of the community in regular services where the holy scripts are read
- **Writes & Monks**, who are responsible for the *replication* of the holy scripts for the next generation of members
- **Missionaries**, who acquire new members in order to increase the *growth* of the community and the religion itself

A religion is only able to replicate and preserve the own genes for the next generation only if all these central elements and mechanisms are available. The prophet creates the genes, the priest expresses them, the monk replicates them and the missionary disseminates them. All of the four are connected to communication or the processing of information: the prophets formulates the rules and writes them down, the priest reads the rules and disseminate them locally, the monk replicates the rules and creates new copies, and the missionary disseminate them globally.

Christianity itself had an unlikely birth attendant: it merged with the Roman Empire (Stark, 1996), despite all fundamental differences for example about money (Brown, 2013). This merger helped to create Christianity as a world religion. By destroying the Jewish Temple and the Jewish roots of Christianity in the Jewish Roman War, the Roman Empire helped to create an independent form of Christianity.

A few centuries later they unified it and declared it a state religion. The powerless organization that worships a founder that has been crucified had become an almighty empire that crucifies itself. The structure of the Catholic Church today still mirrors the administrative structures of the Roman Empire. The canon law of the Catholic Church (*jus canonicum*) has evolved from the Roman law (Johnston, 2015). Thomas Hobbes says in his book “Leviathan” that “the papacy is no other than the ghost of the deceased Roman Empire, sitting crowned upon the grave thereof”.

SECTS AND SPECIATION

In biology a species is usually defined as a group of interbreeding populations which are reproductively isolated from other such groups. This definition of interbreeding organisms is of course problematic for systems where organisms reproduce asexually (Mayr, 1963). The biological species concept cannot be applied to extinct organisms either, since testing whether or not two fossils can mate is not possible. Paleontologists rely instead on the concept of a morphological species. A morphological species is a group of organisms that share a certain degree of physical similarity. This means that organisms which look the same are considered as a single species.

Collective organisms generated by cultural genes do not reproduce sexually. They also have a much larger lifespan than biological organisms, some are already extinct like the dinosaurs in Paleontology, and there is no clear difference between the species and the collective organism itself. The collective organism is a kind of species which reproduces asexually.

A good criteria instead of “interbreeding” would be sharing of common rituals: two groups belong to the same species, if they acknowledge each other and if members of one group can participate in the rituals and sacraments of the other group and vice versa.

Let us take a short look at the whole lifespan of a religious group, from the beginning to the end. The enormous timescale we have to consider is much larger than timespans for biological organisms, but smaller than timespans in geology. Like the giant redwood Sequoia trees in California, social organisms can exist for hundreds of years or even millennia. The Catholic Church is about 1700 years old if you count from Emperor Constantine; the Orthodox Church is 1000 years old if you count from the East-West Schism of 1054, the Protestant Church about 500 years. These are intervals of 500-700 years, far longer than a single human life. The 3000 year old Jewish religion is one of the oldest religions which are still alive.

Even if they exist for millennia, all of them start small: “in the beginning, all religions are obscure, tiny, deviant cult movements” (Stark, et al., 1985). They start if a single person creates successfully a small movement or local group of followers. Small religious groups are also called cults or sects. The difference between sects and large-scale religions is mainly the size (Pickel, 2011).

New religions only survive if they are better adapted to the local environment than the old. If they are not well adapted and fail to win enough new followers they perish. As David Sloan Wilson has shown, successful new religions such as Calvinism are well adapted to their environment (Wilson, 2003).

Early Christianity itself was well adapted to the environment as well: the Christianity from St. Paul was open for all Romans not just Jews, although it clearly originated as a Jewish sect in a corner of the Roman Empire (Freeman, 2009). It offered their members favorable treatment of women and the willingness to nurse and care for those affected by the plagues that swept the Empire, which helped to win new members (Stark, 1996).

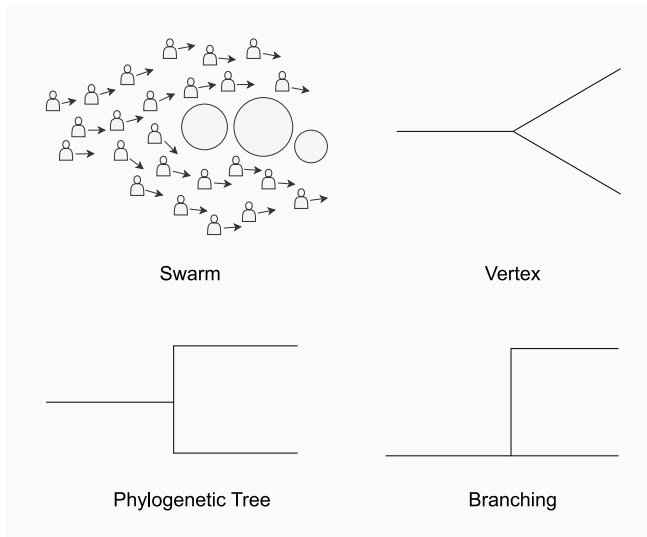
	Jewry	Christianity	Protestantism
State	Israel	Roman Empire	Kingdoms and National States
Religion	Jewish	Catholic Church	Protestant Church
Members	Jews	Romans	Citizens

How do new religions emerge? Rodney Stark and William Bainbridge describe three models of cult formation (Stark, et al., 1985):

- (1) the psychopathology model
- (2) the entrepreneur model
- (3) the subculture-evolution model

The first “psychopathology” model describes cult innovation as the result of a psychopath who provides solutions to a society which is in a crisis, the second “entrepreneur” model states that cult founders consciously develop new systems of religious belief and practice to obtain rewards from the expected followers, and the third “subculture-evolution” model says a new cult is composed of closely interacting individuals who achieve radical cultural developments through a series of many small steps.

Let us focus on the last “subculture-evolution”. Even inside a big religious group there is a high amount of diversity. The big religions are not as homogeneous as you might think. Inside the big branches we have many different movements and subcultures, similar to political parties where we have different wings. According to the Bible we have for example Sadducees, Pharisees, and Zealots in Judaism 2000 years ago. Sects start as a subgroup of a larger group, and if they no longer participate in the rituals of the old group or start to create their own laws, it has created an own branch.



This diversity of movements and prophets is especially large at the beginning of a new branch, and can lead to a new branch in the phylogenetic tree, to the emergence of a new species. In the beginning prophets step forward and invent new rules and principles. This process can be turbulent and chaotic, and is marked by high diversity where there is no unified or coherent religious movement. There was indeed lot of variety in the early forms of Christianity during the 2nd and 3rd century (Pagels, 1979).

The apostles themselves were not completely in agreement with one another. Apostle comes from the Greek *apostolos* (απόστολος) and means messenger, a messenger of the religious group, who is charged with preaching the gospel. In contrast to the other apostles, Paul did not know Jesus personally, and this inevitably led to differences among them. Paul later became the most important apostle for the Protestant Church, while Peter remained the most important for the Catholic Church. And then there was James, the brother of Jesus. James, along with Paul and Peter, was a central figure in the early Christian community. They all had different opinions, and until it became the official state religion of the empire, new holy scripts appeared and vanished again (Pagels, 2011).

During the emergence of Protestantism the situation was similar. Luther, Melanchthon, Calvin and Zwingli could not agree on a common understanding of the Christian religion. They founded different movements which existed for centuries, and only the German emperor Frederick William III finally forced the different branches to merge into a Prussian Union of Churches. He united the Lutheran and Reformed branches. In this sense Frederick William III was similar to the German emperor Constantine I. An emperor wants a unified ideology that supports his rule.

New religions often do not emerge in the center of an empire, but at the periphery far away from the center where the leader has less influence than in the direct center and a prophet has the freedom to imagine a new, better world. Christianity did not originate in Rome, the center of the Roman Empire, and Protestantism was not invented in Cologne or Nuremberg, the largest German

cities at that time. Nazareth was a Jewish province, Medina an Arab province, and Wittenberg a German province. In this province far away from the center, a religious founder or prophet is able to create a new vision of a better world that does not exist yet.

How does a collective organism emerge? In the beginning there is a founder or prophet, who is able to formulate an abstract idea which represents a vision of a better world, based on actual shortcomings or historic experiences such as isolation in exile or suffering under occupation. The prophet has an idea, dream, or vision how a perfect group should be organized. These ideas develop over time and together with myths or legends they turn into an ideology which contains the fundamental rules of swarm intelligence (believe in the group and respect other individuals and their rights). The ideology, in turn, guides the collective action of the group and leads to subjective human experiences that confirm the ideology.

Ideas from successful prophets are usually better adapted to their environment. They are subject to change, just the image of the founder itself. Religious groups create their founders just as much as the founders create them. For example early Christians struggled to define for themselves the identity of their founder Jesus and the real meaning of his message. Elaine Pagels describes this struggle in various books (Pagels, 2004) (Pagels, 2011).

Martin Luther for instance did not want to be the founder of a new religion at all. He wanted to reform the old one. Asked if his followers should be called Lutherans he denied violently and said “How would I, a poor stinking bag of grubs, come to call the children of Christ by my hopeless name?” (Schorlemmer, 2017). Although he did not want to become a founder, Martin Luther is known today as the founder of Protestantism, together with Johannes Calvin and Ulrich Zwingli. Both Jesus and Luther have been created by their followers as much as they have created their followers.

If the prophet or founder has been successful, his life marks the bifurcation point at which a new religion splits from an old one. Just like the phylogenetic

trees in biology, a species splits here in two different ones, which then develop separately from each other.

Once a religion has been established by the founders and their followers, the architects build large temples, churches and cathedrals so that the members of the social organism can meet at a protected place, where priests take over teaching the rules. Old ideologies are often frozen in bureaucracy because too many rules exist that have been expressed over the decades and centuries.

Church buildings, temples and cathedrals themselves are only a solid shell of stone that remains as impressive fossil long after the religious community has stopped to exist, since religions appear and disappear like other living organisms. These living organisms, even if they seem alien to us, leave us temples and cathedrals as the fossil witness of their own existence and former greatness.

The impressive Hagia Sophia in Istanbul, the former Constantinople, or the monumental buildings of the monastery of Mont Saint-Michel in France remain as fossil remains of their former inhabitants after the religious community has ceased to exist. Temples, churches and cathedrals which have turned into museums and tourist attractions are fossil remains of ancient organisms.

The emergence of a new species can go awry, if a new species of a social organism invades other systems in a malicious manner, penetrates all areas of society and claims totalitarian authority. In this case of radical totalitarian ideologies one can speak of cultural tumors, which we will look at in the next chapter.

CULTURAL TUMORS

THE END OF CIVILIZATION

If there are cultural life-forms that are created and maintained by gene expression just like biological organisms, then there should be cultural tumors too. There should be diseases related to the genes themselves, which are based on an alteration in the own gene sequences and lead to an uncontrolled growth and invasion into nearby places and territories. And these diseases exist. They are associated with wars and disasters, and they are so frequent that everyone knows them.

In biological systems tumors often occur if the organism is severely weakened or in a crisis. If a tumor occurs it often means the system is in a crisis or comes to an end soon. This also happens in civilizations. We can observe **tumors at the end of civilizations**, if civilizations come to an end or even run backwards. We want to take a look how exactly this happens in the following chapters.

If we take a look in a history book, it seems to be strange that we find the biggest cruelties in the highest cultures, especially in the beginning or at the end of their existence. Walter Benjamin said in his “Theses on the Philosophy of History” that “There is no document of civilization which is not at the same time a document of barbarism” (Benjamin, 1974).

Why do civilization and barbarism go often hand in hand? One would expect that high culture implies cultivated behavior and lack of inhuman actions. But we find indeed the opposite, for example scholars that were buried alive in ancient China, rebels who were crucified in ancient Rome or heretics who were tortured in the Spanish Inquisition. Other examples are the human sacrifices of the Aztecs or the concentration camps of the Nazis. These are all examples of extreme cruelty and immense inhumanity.

Strangely these examples of immense inhumanity happened in advanced human civilizations, since the old Aztecs, the ancient Romans and the Chinese belonged certainly to the early examples of high civilizations. The Aztecs had a

Hieroglyphic writing system, the Chinese invented Chinese writing symbols, and the Romans used our Latin alphabet. Writing systems are an unmistakable sign of civilization.

The Aztecs used hieroglyphic writings. We can find on the one hand highest culture in form of hieroglyphs and writing systems among nearly all Mesoamerican cultures, and yet on the other hand extreme violence and brutality. Under the Aztecs the Mesoamerican cultures brought the practice of human sacrifices to an unprecedented level.

Ancient China was far ahead of the time, because it was among the first cultures ever that used a hieroglyphic writing system. It is one of the oldest cultures in the world which was based on famous thinkers and philosophers like Confucius and Laozi. In the Qin Dynasty of ancient China impressive projects were realized, including the first version of the Great Wall of China and the city-sized mausoleum of the first emperor Qin Shi Huang guarded by the Terracotta Army. But the first emperor also was a brutal tyrant who buried many people alive and sacrificed thousands of people.

This combination of civilization and barbarism can be found in other ancient cultures as well. The Romans for example were very civilized, but also very brutal. It was not only Jesus who was crucified. Crucifixion was a common death penalty in Ancient Rome, although the Romans used our Latin alphabet and Rome was also the home of poets such as Vergil, Horace, Ovid, and Seneca.

Germany was the country of famous classical poets, playwrights, and thinkers, such as Goethe, Schiller, Heine, Brecht, Fontane und Tucholsky. It is the land of famous composers like Beethoven and Bach, who laid the foundation of classical music. It is the nation of famous scientists like Carl Friedrich Gauss, Max Planck and Albert Einstein. Gutenberg helped to invent the printing press and book printing. And yet we had WWII with the Holocaust organized by Nazi Germany in Buchenwald, Dachau, Auschwitz and Treblinka.

Then there is the Christian church. The Catholic Church and its founders and saints like Francis of Assisi have shown ways to a society based on love, charity and mercy, but it also used and produced the Medieval Inquisition (Black, 2009) and the Spanish Inquisition (Pérez, 2005) in the Middle Ages.

We can find all these deeply inhuman things in all these advanced human societies: the Aztecs ripped out the beating hearts of living humans and threw them down the stairs of their temple pyramids; the Chinese have buried scholars alive, the Romans have crucified rebels, the Germans have built concentration camps where people were killed in gas chambers, the church has tortured reformers in the Inquisition or burned heretics alive.

How can a high culture crucify and sacrifice the own people in the most barbaric way, how can a church that teaches love and mercy end in the Spanish Inquisition? Why have these incredible inhuman things appeared again and again in all these different cultures and organizations at different times and places? Pure inhumanity cannot be the only reason. On the hand we have the highest form of civilization and culture, and on the other hand we have an abyss of cruelty. How does it fit together?

Well, it starts with a system that is unwilling or unable to change. This happens often if the development has come to an end or the system as a whole is in a crisis. Then a prophet or intellectual comes along and has radical new ideas and plans – plans to bring the system back to former glory that can change the system and topple the existing rulers. By proposing a new system to a wide audience, a single member can change the complete system. Because the system is in a crisis, he is successful in changing the system towards a more radical and simplified version and creates a totalitarian dictatorship, an autocratic system or a big empire.

Then another prophet comes along. Again a single member is able to change the whole system. But this time the system is for obvious reasons unwilling or unable to change. It is of crucial importance to the system to obtain the information of the new idea or to suppress and to eliminate it, which can lead

to all forms of inhuman punishment, coercive interrogation techniques, and physical torture. In this sense, torture is a response of an unjust, brittle and inflexible system to radical new ideas; it is an attempt to eliminate secret proposals for a new system. It is a reaction of a system which is unable to change and to adapt itself.

The reaction of a system which is unwilling to change is especially strong if it has evolved slowly into a different system in the course of time. Examples are crucifixion in Ancient Rome, inquisition in the Christian church, and human sacrifice in the Aztec Empire on a massive scale. The objective of crucifixion, inquisition, and human sacrifice was combating enemies of the system – i.e. combating heresy. The worst possible punishment reflects the worst possible threat for the system. Unjust members who use unfair means and question the system are fought by an unjust system through unfair means.

Ancient Culture	Old System	New System: Dictatorship	Reaction to heresy
Aztec Empire	Independent city states	Aztec Empire	Human sacrifice
Christian Church	Peaceful Religion	Papal Empire	Torture, Inquisition
Roman Empire	Roman Republic	Roman Empire	Crucifixion
Ancient Chinese Empire	Independent feudal states	Chinese Empire	Live Burial
Nazi Germany	Democratic political system of Weimar Republic	Totalitarian system	Concentration Camps

An established ideology fears nothing more than a prophet who creates a better one, the Roman Empire feared the rebels who could end the system of slavery, the emperor of China was frightened of the scholars that criticized his terror regime and proposed a new one. All these early civilizations where acts of immense cruelty happened can be considered as social organisms that were deeply frightened and felt threatened in their own existence.

Critics, rebels and reformers are feared precisely because they can bring down an unjust system. The threat begins by merely describing the injustice accurately. If a new, better system is proposed, then it is apparently an existential threat of the old, existing system.

The original societies in Mesoamerica, for instance the Maya, were all small independent city states based on agriculture. Sacrifice was important for the ancient Maya, but originally the emphasis lied on the sacrifices which the rulers made themselves, for example by all kinds of bloodletting rituals. When they became imperialistic systems which tried to expand their territory by military operations, human sacrifices became more frequent. The Aztec empire and many of the classical Maya city states under the influence of Teotihuacan turned into conquest states, and the temple pyramids turned from places where ancestors were worshiped and rulers made sacrifices into places of terror and human sacrifice. The Aztec ruler Ahuizotl ripped out the hearts from 20,000 captives to suppress vassal city rebellions.

The original Christian church was based on a religion of love. In the 15th and 16th century, the church had become rich and powerful, and it turned from a religious system into a political system, a kind of absolute monarchy. St. Peter's Basilica reflects this change as it turned from a plain church into a magnificent palace, the new Basilica of the 15th century which replaced the old Constantinian basilica. The inquisition happened during this time, a time of rebellion and reformation, where many new forms of the Christian church emerged.

The original Ancient Roman was a culture based on agriculture, too. Mass crucifixions took place from 70 BC to 70 AD, when the Roman Republic turned into an autocratic Roman Empire and the Roman Senate was superseded in importance by the Colosseum (Boatwright, 2011). Crucifixion was used for slaves, pirates, and enemies of the state. Notorious mass crucifixions happened on a large scale during times of rebellion and insurgency: they followed the slave rebellion under Spartacus in 73-71 BC., other Roman civil wars in the

2nd and 1st centuries BC, and the destruction of Jerusalem in AD 70. To frighten other slaves from revolting, 6,000 of Spartacus' men were crucified.

In ancient China during the Qin Dynasty we can find another form of inhuman torture, which was also used in Ancient Rome. People were buried alive on a massive scale. Books were burnt and scholars were buried in order to unify all thoughts and political opinions and to suppress the intellectual discourse. This happened while the Qin Dynasty turned from a political system in form of legalism during the time of independent warring states into a imperialistic military system and an autocratic empire.

Now we can try to answer the question from the beginning why civilization and barbarism go sometimes hand in hand. It can happen at the beginning and the end of an empire or civilization, when culture and power collide, and power prevails. There are two conditions: (1) a system where this occurs must be in a transition, it may have made the transition from a civilized kingdom or monarchy into an increasingly autocratic empire, where an autocrat acts as a despot, tyrant and dictator. Roman civilization shifted from a monarchy to an oligarchic republic to an increasingly autocratic empire, the Christian church shifted from a religion of love to an oligarchic pope system with autocratic traits, the Mesoamerican civilizations shifted from Mayan city states into an increasingly autocratic Aztec empire, and the Chinese civilization shifted from a collection of kingdoms with a legal, political system into an increasingly autocratic Chinese empire. All these systems are marked by a lack of authority and mutual understanding between those at the top and those at the bottom of the system. A real autocrat is only interested in power and has lost contact to culture. And (2) the system must be questioned in a time of a crisis, insurgence and rebellion.

Therefore inhuman torture and terror is not only a reaction of an evil and unjust system which is unable to change and to adapt itself. It seems to be a reaction of a system which fears the own ancestry. It has come to a branching point in evolution, where it has changed so much that it cannot go back, and at the same time it cannot completely loose one's hold on the origin, either. It has changed

so much that it starts to contradict itself, which opens a niche for its own ancestors. The most vulnerable points of such systems are perhaps the own roots: a system is threatened in its existence if it is challenged by its own ancestor, i.e. by a new system which is similar to the original system it has evolved from. To attack the roots means to tackle the fundamental principles of the system. If you criticize or touch the “holy” things of the system – which means the basic rules, customs, or symbols of the community – then you incur the wrath of it, and the more unjust the system, the larger the wrath. The wrath of the system can reveal itself in the violation of the privacy and integrity of the individual. This works in the other direction as well: if an “evil” system touches the holy things of the individual (for instance privacy, freedom and physical integrity), then it may incur the wrath of the particular person.

In its extreme form, the rebellion threatens the existence of the whole system. Then the existence of the system is opposed to the existence of the individual, and vice versa. It seems as if a system becomes especially brutal if its very existence is threatened, and if it knows that its existence is questionable (the church by heretics in the Middle Ages which lead to inquisition, the Romans by insurgents which lead to crucifixion, the Nazis in WWII, ...). The concentration camps of the Nazis turned into real death factories when the existence of the Nazi regime was threatened towards the end of the war. Maybe this is the reason why the Aztecs – who were even worse than the Maya when it comes to human sacrifices – had a high culture and yet drowned in all the blood: because a small number of tyrannical rulers knew their legitimacy was questionable and their existence was threatened. The Aztecs did not invent hieroglyphic writing systems and elaborate temples, they only imitated earlier cultures.

If Auitzotl, the ruler of the Aztecs from 1486 to 1502, sacrifices thousands of victims for the inauguration of a new temple, then it is not hard to see that the reason is to intimidate people. This was true in general: if the rulers of the Maya or Aztecs started to torture and sacrifice their own people instead of sacrificing themselves, then they instilled fear. The greater their own fear, the

greater the fear they had to spread. The more they lose authority, the more they must use terror and violence.

If the ancient Romans crucify rebels along the road they do this to intimidate people. If the church burns heretics during the times of the Inquisition, it is similar: the reason is to intimidate all potential reformers and heretics.

The Nazis and their security forces, Gestapo, SA and SS, have used terror and violence to intimidate potential critics as well. Critics, dissenters and enemies were beaten up by the thugs of SA, tracked and tortured by Gestapo, and imprisoned by SS in concentration camps. The goal was to silence the critics and to avoid any change in the new order of society.

A purely ideological system that is only defined by an ideology is especially sensitive to any criticism of this ideology. For a system that is defined by holy books any slight change in the text of these books is extremely dangerous. The holy books are holy, because they are not allowed to change. A slight change would threaten the integrity of the system and the system as a whole. A system that is defined by genes will try to protect these genes at all costs. In biological systems genes are protected by the walls of the cell nucleus. In social systems taboos and bans associated with sacred things are used to protect the genes in the holy books. It is forbidden to change or even to touch holy things because they belong to all of the group members and because they are connected to the integrity of the whole system. Otherwise single individuals could threaten the integrity of the whole community if they change the holy texts, as it is the case for heretics and reformers.

Therefore one task of the inquisition was the censorship of texts. During the censorship of text the system reacts similar to biological cells that defend themselves against viruses to prevent any contamination of the DNA in the nucleus. The book burnings of the Nazis and the first emperor of China have the same purpose. They were not purely symbolic, and served a real purpose: the physical destruction of gene material that could potentially contaminate or

even replace the cultural genes. If books can contain cultural genes, then book burning is indeed a physical elimination of foreign genes.

In this sense the security services of the Nazis, Gestapo, SA and SS and the inquisition of the church were the immune systems of the organism that tried to find enemies of the system and acted against any threat. In normal systems this task of the immune system is fulfilled by police and justice system, as Niklas Luhmann reports (Luhmann, 1984).

Heretics were killed in the most cruel and gruesome way from the inquisition because they were an existential threat for the whole system. The writings of reformers and prophets can destroy an existing system because they are the holy scripts and manifests from tomorrow. For the rebels in the ancient Roman and Aztec Empire it was similar. In this sense the cruelty of these more or less degenerated systems is a scaring reaction of a scared system, a fierce response to an existential threat of the system. The more a system is terrorized and threatened, the more it reacts with terror itself. The most brutal response can be observed if the own existence and the own genes are severely threatened.

Now we can understand perhaps Walter Benjamin a bit better when he says that there has never been a document of culture which is not simultaneously one of barbarism:

“Whoever has emerged victorious participates to this day in the triumphal procession in which the present rulers step over those who are lying prostrate. According to traditional practice, the spoils are carried along in the procession. They are called cultural treasures, and a historical materialist views them with cautious detachment. For without exception the cultural treasures he surveys have an origin which he cannot contemplate without horror. They owe their existence not only to the efforts of the great minds and talents who have created them, but also to the anonymous toil of their contemporaries. There is no document of civilization which is not at the same time a document of barbarism” (Benjamin, 1974).

CULTURAL TUMORS

The systems we have described in the last chapter where societies torture or sacrifice their own members can be considered as sick societies. But what kind of illness is it if we consider the imperialism of the ancient Romans and Aztecs, the authoritarianism of the Catholic Church in the Middle Ages, or the Nazism of the Germans in the 20th century? Are there really degenerated cultural systems which can be considered as cultural tumors, and how do the genes have to change so that a tumor can develop?

Well, if we try to think without limits and banisters, as Hannah Arendt (Arendt, 1951) and Erich Fromm (Fromm, 1941) did during their analysis of Nazism, then we stumble indeed upon surprising insights. For Hannah Arendt propaganda has an essential role in totalitarian systems, and as we discussed in the last chapters gene expression is essentially propaganda. She noticed that “the true goal of totalitarian propaganda is not persuasion but organization” (Arendt, 1951) and argued that the totalitarian single-party state on the road to total domination led to the end-result of a sick “concentration-camp society”.

Erich Fromm has named the sick societies clearly: they can be found in every society where humans themselves are no longer in the center of attention (Fromm, 1955). The problem we have seen in the last chapter is that collective organisms in a society, if they feel threatened, can lose sight of humans although humans are the basic building blocks of every society. Then they might start to torture the own members if they feel threatened or expand aggressively into neighboring territory. Erich Fromm says a society is only healthy and sane if it meets basic human needs, and names as an example of a sick society Nazism in Germany, Fascism in Italy and Stalinism in the Soviet Union (Fromm, 1955).

They were all totalitarian systems that grew like malignant tumors, exceeded the own borders, created concentration camps or Gulags, and invaded nearby systems. They did not only act like malignant tumors, they actually were malignant tumors. If we assume that cultural genes exist, one has to conclude

inevitably that malignant tumors exist in society, too, in the past, in the present, and in the future (Albright, 2018). If there are cultural genes that create living organisms, why shouldn't these organisms and the societies they live in get cancer too? And they do, in fact quite frequently.

We know these cases under the name of general name of fascism. The best way to define fascism in general is to say it is a form of social cancer that comes in different types and forms. In the following we will try to explain why, and if this is the case, then fascism will most likely remain a problem in the future, because in this case it is a core-problem of our human society, as old as human civilization itself. It is not a problem of the 20th century. Fascism in all of its variants remains a problem of our society, and there are still books written about it (Stanley, 2018).

All books about fascism agree that fascism is difficult to define. Even the biographers of Mussolini like Richard Bosworth have difficulties to define what fascism is, although Mussolini was the inventor of fascism (Bosworth, 2010). Fascism is a fuzzy term that is characterized by what it is not, by anti-attitudes (Payne, 1983). The early Italian fascism from Mussolini was against socialism, although Mussolini has been a socialist himself before. The Nazis had "Socialism" in the party name ("National Socialism") but were as a right-wing party against socialism and communism, and above all characterized by antisemitism.

It is easier to understand fascism if we look at what the affected countries do: we normally see aggressive, uncontrolled military expansion, concentration camps for critics and prisoners of war and ubiquitous propaganda. If we consider military expansion and ubiquitous propaganda as tumor markers of cultural tumors, then already Prussian militarism under Frederick the Great and French Bonapartism under Napoleon can be considered as fascism. Napoleon conquered half of Europe and created a propaganda-based state. Taylor writes "Under Napoleon, France became the first truly modern propaganda-based State [...] Napoleon believed that 'three hostile newspapers are more to be

feared than a thousand bayonets' and he accordingly closed down 64 out of the 73 French newspapers in 1800-1" (Taylor, 2003)

Examples can even be found in ancient times, for instance if we look at the imperialism of the Roman Empire. In the Roman Kingdom 753–509 BC the king was the chief priest, lawgiver, judge, and commander of the army. He had religious, judicial and military functions. In the Roman Republic 509-27 BC the power was shifted to elected public officials and executive magistrates. A magistrate could be a Dictator, Consul, Praetor, Censor or Quaestor. Military powers were granted to consuls and praetors (they were granted "Imperium" which meant authority to command military units), judicial powers mainly to praetors, and financial powers to quaestors (Lintott, 2003).

The creation of a dictatorship by Caesar was apparently a fallback from a republic where legislative and executive branches of government have started to become independent into a past time of kingship that was present in the ancient Roman kingdom, accompanied by an ever growing hostile expansion into nearby territory. This imperialism can be considered as a type of fascism.

Another tumor marker or hallmark of fascism is propaganda (Stanley, 2015), and propaganda was indeed ubiquitous in the ancient Roman world, especially when the republic became an empire during the times of Julius Caesar and Emperor Augustus. The Roman propaganda argued that Rome was waging war only for defensive purposes and the Rome was the victim of aggression, which was clearly a lie. Inscriptions on monuments, paintings in public buildings, images on coins, and statues of generals praised the Roman victories. Philipp Taylor says "the success of Roman military power was in itself excellent propaganda" (Taylor, 2003).

In ancient Egypt, pharaoh Akhenaten can be considered as a founder of fascism. He wanted to introduce a new kind of monotheism where he would be supreme king and priest all in one person, obviously a fallback from a kingdom with independent priests and kings into a past time of god-kings. It was named Atenism. The ancient Egyptian cities each had their own temple and their own

god before Akhenaten. Priests and kings were independent. Amun was worshipped in Thebes, Horus in Hierakonpolis, Thoth in Hermopolis, Osiris in Abydos, etc... Akhenaten apparently wanted to make Egypt great again and suspended the old division (Shaw, 2000).

The things we observe here in Napoleon's Bonapartism, Caesar's Imperialism and Akhenaten's Atenism are typical in general: a fallback into past times to make a country great again, massive use of propaganda, a merging of (evolutionary) branches which were previously independent, and a hostile expansion into nearby territory. This hostile expansion into nearby territory is also characteristic for cancer in biological systems: "cancer cells reproduce without restraint and colonize foreign tissues" (Alberts, et al., 2014).

These points can be seen as tumor markers of cultural tumors:

- a fallback into past times to make a country great again
- hostile military expansion into nearby territory
- massive ubiquitous propaganda and censorship

To understand how they work we have to examine the religious aspect. Erich Fromm notes "If we want to understand how systems like fascism and Stalinism can possess millions of people, ready to sacrifice their integrity and reason to the principle, 'my country, right or wrong,' we are forced to consider the [...] religious quality of their orientation" (Fromm, 1950)

We have seen that religions are life-forms based on genes. If fascism has a religious quality, it means it is a kind of organism or life-form too, where the religious components have merged with political aspects. Religions have a universal ideological foundation which they share with political ideologies. Danger lurks every time when system borders are crossed, for instance if a party is religious or has a religious ideology, or if religious sects have political goals, although the systems have already separated. In this case, for instance in certain radical forms of Judaism, Christianity or Islamism, we cross the border between political and religious systems and are on the way to disaster. In

racism we violate the border between biological and political systems; in communism we break the border of economic and political systems.

Madeleine Albright said fascism is a disease for society (Albright, 2018). She is right. Almost every “ism” name such as fascism, communism, or Nazism can be seen a name for a malignant illness of society. Even nationalism, racism, sexism, imperialism, capitalism, and terrorism fall in this category. Members and followers of these systems are named “ists”: fascists, communists, nationalists, racists, sexists, imperialists, capitalists, terrorists, etc. Cultural tumors are nothing else than the well-known “isms” realized by their “ists”, communism by communists, terrorism by terrorists, fascism by fascists, etc. They all can be viewed as tumors of society that is based on cultural genes. Fascism is a cultural tumor of society. Usually these “diseases” of society are associated for the malignant types with war, violence and armed conflicts.

It is no accident that many of these “isms” are similar. Stanley Payne writes for instance “There is no doubt that [...] fascism and communism share many fundamental characteristics” (Payne, 1983), and Hannah Arendt describes the similarities between Nazism and Soviet Communism (Arendt, 1951).

The reason is all these “isms” can be considered as the same phenomenon that comes in different degrees of severity and malignancy. It can be seen as a disease for society. The name of the “ism” indicates the origin of the disease, just as the different names for cancer indicate the organ where it is originated. For example breast cancer means the breast is the origin of the cancer, lung cancer means the lung is the origin of the cancer, etc. It is similar for the various forms of “isms”, for instance communism, where the origin is the community and the abolishment of private property because everything belongs to the community, or racism, where the origin is indicated by the controversial and problematic name “race”.

FASCISM AS CANCER

Why is fascism in general a form of cancer? As we have argued in the last chapter we can say

1. It comes from within the own system. The various fascist moments in Europe before and during WWII came all from within the own countries and political systems (Payne, 1995)
2. It tries to destroy the existing political order in which it was born - it rejects constitution & parliament, democracy, democratic elections - in just the way cancer destroys the organ and the body in which it emerged (Sternhell, et al., 1994)
3. It grows and expands aggressively into nearby territory (Kallis, 2000)
4. It is based on massive changes in the amount of propaganda (Taylor, 2003), which result from changes in gene expression

Cultural tumors in social systems are caused by changes on the system level and by changes on a genetic level. Cancer is a genetic disease. Let us take a look at the question how genes and their expression have to change in detail. We can first observe a massive change in gene expression.

In biological cancer we have aberrant gene expression everywhere. Abundant aberrant DNA methylation patterns are very common in biological tumors, and they cause massive alterations of gene expression. DNA methylation is an epigenetic modification that has an important role in the regulation of gene expression and cell types.

Instead of aberrant DNA methylation patterns, we can observe in fascism in general aberrant propaganda patterns. The patterns differ in authoritarian and totalitarian systems, but in both systems we have abundant propaganda everywhere, including frequent lies and massive distortions of the truth. Ubiquitous aberrant patterns of propaganda are a necessary condition so that so that a cultural tumor can develop, because all critical information about the ruling group must be heavily suppressed and censored, while all positive information about the ruling group must be emphasized.

Normally political parties appeal to reason to win members and voters. They propose ideas how society should be and how it should be changed. Fascistic parties create passion to win members and votes, what Robert Paxton calls “mobilizing passions” (Paxton, 2004). A time of crisis where people feel humiliated and threatened is an ideal opportunity for strongmen who promise to make the country great again. Strongmen who address emotions directly and promise redemption and salvation act like religious prophets that gather followers. Emotions are used here as a primary means of controlling persons, an ancient form of control that was used in religions too before people had the ability to read, write and reason. In this sense the use of passion and emotions in politics is similar to anaerobic glycolysis in biological cells⁹.

Nazi ideology was so primitive that it barely can be considered as a comprehensive or consistent ideology. In her book Madeleine Albright tries to argue that fascism is not an ideology (Albright, 2018). She argues it is a method, a system, and a process for taking and holding power by stirring people up, promising them salvation and giving them someone to hate.

An example for this process is a typical Hitler speech where he expresses his point of view (and the “genes” of Nazism so to speak). His speeches typical began by illustrating the humiliating current situation and describing the defeat, followed by a call to make the nation great again. First he would describe that the nation has been defeated and is in a great crisis, that it had lost its freedom, power, pride, honor, and culture. The reason would be that the people are not unified enough and the nation had been disintegrated. Then he would make an appeal to unify the nation, to believe in the nation and to make it great again. For everything else he blamed a minority group, the Jews. He closed his speeches often by repeating the Nazi slogan “Sieg Heil”, which means “victory & salvation”. This reveals that Nazism was a response to the actual situation of defeat and doom in the economic crisis that followed on World War I, where

⁹ Anaerobic glycolysis has been the primary means of energy production in earlier organisms before oxygen was at high concentration in the atmosphere. It represents a more ancient form of energy production in cells.

dissatisfied people longed for salvation and redemption. Nazism was a response to defeat.

If we look at the 25-point Nazi party program from 1920 we can find violations of basic system borders and constitutional rights (point 3 demands additional territory and threatens the sovereignty of other nations, point 4 is pure antisemitism, point 23 restricts freedom of the press, point 24 restricts freedom of religion and point 25 demands unlimited authority).

Both Hitler and Mussolini embraced violence. They rejected the free press and dismantled the institutional structures within the society, like parliament or judiciary. Nazism was based on antisemitism and racism on the one hand, and nationalism on the other hand. It was not a political ideology that explains how society works or should work. As a conservative movement it emphasized merely that everything should stay as it is and the own “superior” culture should be preserved. The only solution it offered was violence and war. It tried to explain how society should be organized though, as a single unified entity in form of a mass movement, and it was successful in creating a strictly hierarchical mass movement that led to a totalitarian single-party state.

The single-party state was characterized by militarization and sacralization. The society organized itself for military conflict and violence, and it organized itself for the worship of a state religion, where the party and the state are worshipped constantly. As Emilio Gentile has described, secular political entities such as the nation, the state or a party became the focus of myths, rituals and gradually became objects of faith, loyalty, and reverence (Gentile, 2001). State, nation, religion, politics, military, media and economy merged into one single system, although church and state had already been separated in the 20th century¹⁰.

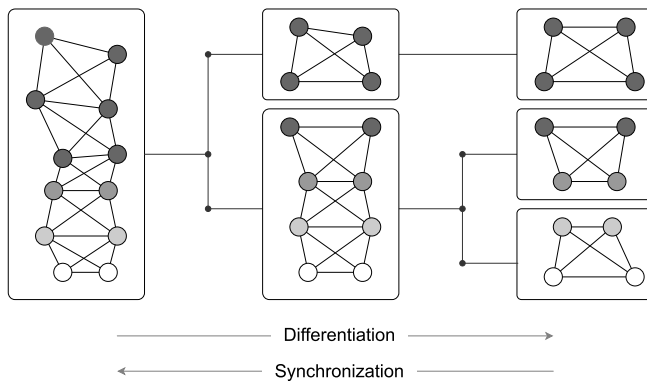
¹⁰ Frequent conflicts between church and state have been typical for the Middle Ages where popes and kings struggled for power, for example the conflicts between Pope Gregory VII and king Henry IV of Germany (1050-1106), Pope Boniface VIII and king Philip IV of France (1268-1314), or Pope Paul III and king Henry VIII of England (1491-1547).

The changes in radical forms of fascism are especially directed against religions and religious communities. In Nazi Germany there were obviously directed against the Jewish religion. The law that comes closest to an oncogene is the Nazi “Law to Remove the Distress of the People and the State”, also called the “Enabling Act”. The enabling act of 1933 gave the government the right to create any law without the involvement of the parliament, which is like the enabling of an oncogene that allows arbitrary mutations in the genome. As a result numerous fascist and racist laws were created for example the “Law against the Establishment of Parties” which was the end of parliamentary democracy, the “Law to Safeguard the Unity of Party and State” which merged party and state officially, and the racists Nuremberg Laws from 1935. Nazism as a totalitarian form of racism is characterized by racist laws.

In the communism of the Soviet Union there were laws against the public singing of religious songs. It is no accident that Nazism and communism turned against religions. Both Nazism (Bärsch, 2002) in Germany and communism (Ryklin, 2008) in the Soviet Union had a strong ideological component and tried to take the place of the old religions themselves. In these totalitarian systems political ideologies compete with religions because they have religious character themselves. The supreme leader is at the same time the highest priest of the party and his speeches have the character of church services. The party language is characterized by religious pathos. Heroes of the party are worshipped, especially when they are dead, similar to the saints of the Catholic Church.

In the countries of the former Soviet Union religions and religious organizations were fought in the name of progress and modernity. Churches were destroyed and religious organization discriminated. But since the single-party system had itself religious character it was in fact a step backward towards a time where countries were ruled by religious ideologies. This step backwards, a throwback in time, accompanied by an aggressive expansion into nearby territories is typical for cultural tumors.

On the level of the system, tumors are characterized by a merging of several separated systems into one unit. Fascism comes from the Latin word *fascis* which means “bundle”. A *fascis* was a name for a bound bundle of wooden rods, sometimes including an axe. It was the symbol of power for the highest ranking government officers in ancient Rome. A bundle is in fact the crucial property of fascism. In fascism and especially in its most extreme form, in totalitarianism, a highly differentiated system of political parties, economic companies, media organizations and religious organizations is turned into a single bundle of state-owned enterprises in a religious single-party state. Political, economic and religious systems are merged in one single system, which is a fallback in an ancient time when these systems were not separated.



From an evolutionary perspective these diseases of a social system are a dimensional reduction of a multi-dimensional evolutionary system. Several independent and highly differentiated systems are merged into a single, coordinated system, which is aggressively expanding into nearby places. In Nazism this was called “*Gleichschaltung*”, which means “bringing into line”, “to toe the party line” or simply “synchronization”.

Paul Davies and Charles Lineweaver write that cancer could be seen as throwbacks to a simpler evolutionary past (Lineweaver, et al., 2013). While it

is unclear and controversial if such an explanation can be used for biological cancer, it is valid for cultural cancer, as we have just seen. Fascism is clearly a throwback to a former time: an attempted throwback that goes awry.

We can say that in evolutionary social systems evolution which is running backward is associated with cancer. Fascism, authoritarianism, totalitarianism, etc. reduce the number of related evolutionary systems which normally increases in the course of time. It is a step back towards a state of less differentiation and towards more primitive evolution in fewer dimensions. Evolution runs backwards in authoritarian and totalitarian systems. It is a bit like Jurassic Park on the level of systems.

A throwback is associated with crossing system borders and merging systems. We get indeed problems whenever system borders are crossed, between politics and religions, politics and economy or politics and biology. Hobbes said the natural condition is a war of all against all, a “bellum omnium contra omnes” (Hobbes, 1996). This continual “struggle for existence” as Darwin calls it (Darwin, 2008) goes on in multiple systems. We have competition among parties in political systems, companies in economic systems, or organisms in ecological systems. Whenever two or more different systems are brought into line and merge the conflict can escalate to all systems.

On the level of the individual person sexism, racism and nationalism are connected to deep fears of social decline and losing one's privileges and social status. In sexism among men for example, men have in some societies traditionally more rights than women and fear that they could lose them. In racism white people in America have for historic reasons more privileges than colored people and fear they could lose them. In nationalism normal citizens have traditionally more rights than immigrants (citizenship, social welfare and voting rights) and fear they could lose these special status. The outrage that is caused by the fear of losing privileges can lead to protest movements which in turn can lead easily to fascist movements. On a collective level protest movements become especially dangerous if they do not respect the constitution of the system, violate basic rules of the system and spread into nearby systems.

As a rule of thumb the various “isms” are more primitive than the actual system in which they have emerged, and to compensate that they are marked by increased aggressiveness and expansion into nearby areas, places and territories. The more totalitarian a system is, the more aggressive the tumor.

In the most extreme totalitarian systems many people had the feeling of being part of something bigger. They were indeed part of something bigger during the time of fascism in Italy, Nazism in Germany and communism in the Soviet Union. They were part of a big malignant cultural tumor that spread of large parts of Europe.

Normally evolution tends to increase complexity in the course of time, see for example Lineweaver (Lineweaver, et al., 2013). There is a tendency to explore every possible combination, towards an increasing level of differentiation, a stronger division of labor, and a higher degree of complexity. Life is organized in hierarchically nested levels of organization (Michod, 1999) which have emerged during evolution transitions (Smith, et al., 1997). During these evolutionary transitions new evolutionary systems and subsystems have emerged, and the world has become less primitive and more complex (Morowitz, 2002).

In the beginning there is the evolutionary system from biology everyone knows. This is the classic biological evolution which Charles Darwin described first and which is the starting point (Darwin, 2008). Then we have multiple sets of cultural genes which act in the same society.

In the religious system each religion proposes a consistent ideology and the different religions struggle for existence. The ideology is mainly a bundle of consistent ethic guidelines and social policies. Their main resources are new members, and they are in a constant competition for new members in order to survive. Individual organisms can get very large and old.

In the political system kingdoms were superseded by nation states where parties compete for power. Each party proposes a consistent ideology of

policies and the different parties struggle for existence in the political world (Ware, 1995). Like religious organizations, they are based on ideologies in a constant competition for new members and new voters in order to survive.

In the economic systems firms occupy a niche in the market economy and compete with each other like species. Competition can drive the less innovative and less profitable ones out of business (Nelson, et al., 1982) or it leads to arms races (Frank, 2011). Utility and profitability is related to the concept of fitness (Gandolfi, et al., 2002).

One can say we have in all of these cases a complex adaptive system where competing organizations are in a constant struggle of existence, as Darwin called the battle for resources that are needed to live. Each subsystem is a “sphere of life”, as Hannah Arendt calls it (Arendt, 1951). There is the private sphere of life, where families tussle with each other, the political sphere, where political parties fight each other, the economic sphere, where economic corporations compete with each other, and the religious sphere, where religious groups compete for followers. These spheres of life are different evolutionary systems in the same society. If they merge and collide, if one of them tries to go back in time to more primitive forms of organization, we get the cancer of fascism in all its forms, from authoritarianism to totalitarianism.

To sum it up, there can be different evolutionary systems in the same society, and if they merge and collide, we get the disease of fascism, which can be seen as a cultural tumor or cancer of society. We examine the different types and forms in the next chapter. They depend on how many systems have merged or where it started.

TYPES OF TUMORS

We have defined fascism as a cultural tumor of society in the last chapter. It comes from the own system, destroys the existing order, grows and expands aggressively and comes along with massive changes in propaganda (aka gene expression). There are many theories about fascism and all the related types of “isms”. Even Karl Marx, the eponym of Marxism and inventor of communism, had a own theory about Bonapartism (Saage, 2007). Recent books about fascism in general are from Madeleine Albright (Albright, 2018) and Jason Stanley (Stanley, 2018). The analysis from Robert Paxton is one of the best, because it tries to find similarities between different forms of fascism in different countries and arrives at a good definition (Paxton, 2004). Fascism is indeed hard to define if we do not define it as a cultural tumor because every form of fascism is unique, and fascism touches many different systems. Nazism in Germany was different from fascism in Italy, and both were different from communism in the Soviet Union. What they have in common is certain stages of malignancy and growth.

Robert Paxton has identified five stages marked by increasing radicalization and aggressive expansion into nearby places and sites. One part of the system grows until it dominates all others, and then it breaks through the system boundaries and starts to grow in other systems as well. Paxton says:

“I propose to examine fascism in a cycle of five stages: (1) the creation of movements; (2) their rooting in the political system; (3) their seizure of power; (4) the exercise of power; (5) and, finally [...] radicalization” (Paxton, 2004)

We can find the same five stages in biological cancer. The cancer stages of the TNM staging system for solid tumor cancers classify the extent of tumor cancers. They range from a harmless tumor in an early stage which is locally confined to a malignant tumor in a final stage which is extremely dangerous because it grows aggressively into nearby places and territories. The stages are characterized by increasing levels of growth and aggressiveness.

It is no accident that Robert Paxton's five stages of fascist movements correspond exactly to the five stages of cancer. Fascism is a cancer of society. The stages are:

Stage	Cancer	Fascist movement
0	Tumor “in place”, changes are still located in the place they started and have not spread to nearby places. Mobilizing forces become active.	Creation. Intellectual exploration phase, where disillusionment increases mobilizing passions
I	Early stage. The Tumor is usually small and hasn't grown outside of the organ it started in, but it has become a visible entity.	Rooting , where a fascist movement in an early stage, aided by political deadlock and polarization, becomes a player on the national level
II	Intermediate stage. The tumor is larger and starts to grow.	Arrival to power, where conservatives seeking to control rising leftist opposition invite fascists to share power
III	Advanced stage. The tumor starts to grow outside of the organ and grows into nearby places and tissues.	Exercise of power, where the movement and its charismatic leader control the state in balance with state institutions such as the police and traditional elites such as the clergy and business magnates.
IV	Final stage. The cancer has spread to distant sites and places (metastatic spread)	Radicalization where the state either becomes increasingly radical, as did Nazi Germany, or slips into traditional authoritarian rule, as did Fascist Italy

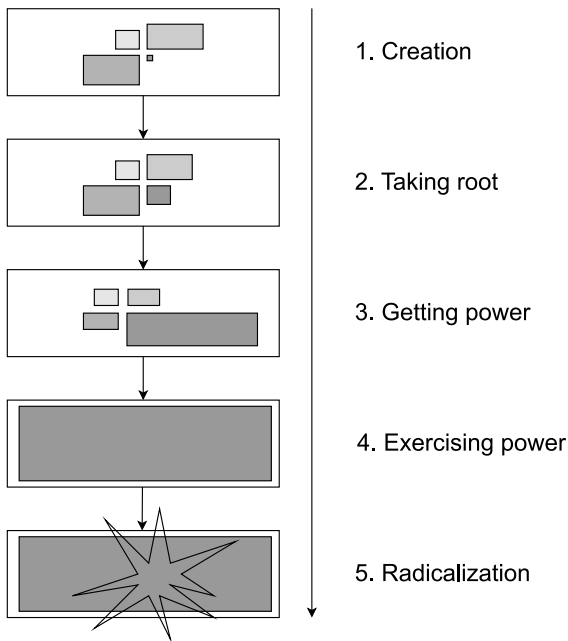
For fascism in general we can use the same classification. Cultural tumors are very similar. They reach different levels of growth and malignancy. One part grows until it dominates all others, and the most malignant tumors start to grow in other neighboring systems as well.

The last stage of “radicalization” for a fascist movement can be observed well in religious movements. Charles Kimball tries to distinguish between “authentic” and “corrupt” forms of religious expression for religious organizations, and lists in his book “When Religion Becomes Evil” (Kimball, 2002) five warning signs or symptoms of a religion which is becoming evil:

- Absolute truth claims to be the “only true religion”
- Demand for blind obedience and total loyalty

- An "ideal" time (i.e. longing for a mythic past or an end time)
- An end that justifies any means
- Declaration of a holy war

These are all aspects of a fascist movement that has reached its final fifth stage. Another point that Kimball does not mention is the zealous aspect: devotedness to pass your ideology to others can have an evil aspect if it is combined with force, violence and absolute truth claims.



The starting point of a fascist movement is also a good property to differentiate between the different types of tumors. One way to distinguish between the different types of cultural tumors is the stage of growth and the level of malignancy. In biology every cancer is unique, but some are malignant, while

others benign. We can classify them by the degree of malignancy and by the stage of radicalization in which they are in, from early to final stages.

The other way to classify a tumor is to look at the affected systems and subsystems, and the system where the tumor has its origin. Biological tumors originate from various organs. While every cancer is unique, we can distinguish different types of biological cancers by the organ in which they appear: lung cancer comes from the lung and breast cancer originates in the breast, and so on and so forth.

Similarly, we can distinguish cultural tumors for society by the subsystem in which they have emerged: nationalism comes from the nation, racism from the “race”, communism from the community, etc. The totalitarian communism in the Soviet Union “emerged” from the “organ” of community and economy and resulted in a state controlled economy where private property was abolished. The totalitarian Nazism in Nazi Germany “emerged” from the “organ” of the defeated and humiliated national state and resulted in a strong “nationalism”, which lead in combination with extreme antisemitism and racism to a totalitarian dictatorship.

One remarkable thing about cultural tumors is that they violate system boundaries and elementary rules of society from the beginning. They start to break through the country boundaries and invade neighboring territory by war and violence only if they are strong and big enough, in the final stage 5 of Paxton (Paxton, 2004), but they also violate sub-system boundaries from the start. For example as we will see in the next chapter, the cultural stem cells that lead to fascism combine characteristics from multiple systems from the start.

We have considered the stage and the origin as two possible classification types for cultural tumors. Two other important properties are how many subsystems are affected, and how much the cultural tumor tries to go back in time towards more primitive systems of organization. The two properties are related. Let us try to take a step again in order to describe it.

The cultural tumors we know as the different types and forms of fascism touch many different systems: politics, religion, military, media, economy and biology, each of them is already complex enough itself. These systems are in fact related and have often common roots. They are the different social systems that sociologist Niklas Luhmann has examined in his comprehensive theory of systems (Luhmann, 1984): the religious system, the political system, the economic system, the healthcare system, the art system, the judicial system, and the media. The religious system is the origin of all.

Erich Fromm mentioned that many different “isms” such as nationalism, patriotism, imperialism and racism are a form of group narcissism. The grandiosity of the group and its “chosenness” compensates for the deficits in the sense of identity of the individuals, especially if they have been humiliated by a lost war, a lost job or other forms of dignity deficits (Funk, 2019)

Group narcissism for family ties among core families, extended families, clans or dynasties leads to authoritarianism and in the extreme case to racism. Group narcissism for social ties among idealized social groups like nations or parties leads to nationalism, communism and in the extreme case to extremism and totalitarianism.

In the beginning of human civilization, for example in ancient Egypt in the Old Kingdom, in ancient Mesopotamia among the Sumerians or in ancient Greece among the Minoans, it was all the same: each city had an own god and an own temple who was church, court, town hall, media center, economic center, university and government all in one. The king was God-King, highest priest, mayor, professor, judge, president and national CEO all in one person.

Over time the systems became separate entities, and independent sub-systems emerged which had their own rules and laws. It took many centuries until state and church became independent and the separation of church and state became separate entities. In times of crisis there have been fallbacks into the old system which had fewer sub-systems where individual systems demanded absolute power over the complete system.

Mussolini defined fascism as a “revolution of reaction”, a conservative revolution that is directed backwards (Ben-Ghiat, 2004). He wanted to revive the old glory of the Roman Empire, tried to turn back the clock, and promised to make the country great again. Radical organizations and parties often want to turn back the clock in order to revive a glorified mythic past (Stanley, 2018), in the hope that it will be better than the miserable present, for example the Islamic State (IS) in Syria and Iraq that wanted to go back ten centuries in order to bring back the golden age of the Islamic Caliphate in Baghdad from the 8th to the 12th century after Iraq had lost the Iraq war against the US, or the Nazis who originally wanted to go back 50 years to bring back the glorious times of the German empire from 1871 after it had lost the first world war in 1918 (and Hitler even looked like a bad caricature of the German emperors which always had a mustache), but then decided to go much further back to the first German empire, the much older Roman Empire of the German Nation that lasted from 962 to 1806. Therefore they used the name Third Reich, which means Third Empire.

The followers of these radical ideologies find the idea appealing that the societies would return to the authentic, true beliefs of the ancestors after everything has become a mess. Napoleon brought back the French kingdom for a short time after the mess of the French revolution, Hitler wanted to revive the German empire after the mess of World War, while Mussolini in his delusions of grandeur wanted to bring back the old Roman Empire.

The more an organization tries to roll back time, the more radical it is, and the more systems it will affect and comprise. The reason is simple: the systems have split up more and more over time in the course of evolution. If we try to go back by turning back the clock, the systems inevitably merge again.

As a rule of thumb one can say: the more sub-systems a cultural tumor affects and merges, the more radical and malignant it is. The more an organization tries to roll back time, the more malignant it has to be, because it creates enemies for each sub-system it affects.

The most harmless types of cultural tumors are forms of patriotism and nationalism, as long as they do not try to expand aggressively into other systems and territories. A bit of pride for the own country in patriotism or nation in nationalism is normal.

The most aggressive types of cultural tumors are Nazism, totalitarianism and other totalitarian systems like communism in the Soviet Union. They affect almost all subsystems and merge them into one unit, the single-party state: politics, media, religion, military, banking and even biology by inventing a “race”. Totalitarianism demands complete loyalty and subservience to the ideology of the state. It prohibits opposition from parties and individuals alike, and exercises an extremely high degree of control over all aspects of public and private life.

The most general one is fascism, the worst are Nazism as the extreme form of fascism and totalitarianism, and the most frequent is terrorism. Nationalism and capitalism are less extensive forms, which extend mostly on economy and politics. The following table is possibly a bit simplistic, but it illustrates that the worse a fascism is, the more systems and subsystems it tries to merge into one single system.

System	Nazism	Communism	Colonialism	Imperialism
Economy	x	x	x	x
Banking	x	x	x	x
Politics	x	x	x	x
Culture	x	x	x	x
Military	x	x	x	x
Religion	x	x	x	
Media	x	x		
Biology	x			
Who rules?	Dictator/Fear	Community	Colonial Power	Imperial Power

At the moment it is unclear if capitalism can be counted as a cultural tumor as well, and it might be hard to judge because we are living inside a capitalistic

system right now. The name indicates that something is wrong here, too, and that the capital is in the center of attention, and not man itself.

System	Fascism/	Theocracy	Nationalism	Capitalism
Economy	x	x	x	x
Banking	x	x	x	x
Politics	x	x	x	x
Culture	x	x	x	
Religion	x	x		
Military	x			
Media	x			
Biology				
Who rules?	Dictator/Fear	Church	Nation	Money

The development pattern in all types of fascisms is similar: it is a form of group narcissism, as Erich Fromm noticed (Funk, 2019): racism emerges if a certain “race”, for example the race of “white people”, considers itself as the chosen one that is meant to rule over others. Nationalism and imperialism emerge if a certain “nation” considers itself as the chosen one that is meant to rule over others. Those who do not belong to the chosen group are excluded in an “us vs them” worldview (Stanley, 2018).

The ideologists of these totalitarian systems postulate like religions a mythical new man who fits perfectly into the new society, for instance the New Soviet man who fits perfectly into the community or the perfect “Aryan” of the Nazi ideology who fits perfectly into a racist Nazi world. Stanley Payne writes (Payne, 1995): “Hitler’s concept of National Socialism was unremittably revolutionary, but he sought revolution of a unique kind - a racial revolution [...] This would also require a revolution [...] in which Germans would develop not merely a purified race but also a new mind and spirit. In Hitler’s words ‘Those who see in National Socialism nothing more than a political movement know scarcely anything of it. It is more even than a religion: it is the will to create a new man’”. The reason of this mythical new man is that the totalitarian ideology requires the application of its cultural genes to all aspects and levels

of societies to create one giant social organism. These new individuals are necessary building blocks of the new organism that emerges from society.

Historically we can observe a great variety of different types and forms, and the different “ism” types competed against each other in various conflicts and wars, for example the Nazism against communism in WWII, or communism against capitalism in the Cold War. In general the cultural tumors coexisted in constant competition and struggle against each other. The struggles will certainly continue as long as there are new cultural tumors and systems exist which belong to these different “ism” types. In this respect Huntington's book about the clash of civilizations contains a true aspect (Huntington, 1996).

CREATION OF TUMORS

Robert Paxton argues that fascism occurs like cancer in biological systems particularly in times of crisis when normal defense mechanisms fail and the organism has weakened massively (Paxton, 2004). In democratic societies this can happen if there are insurmountable social and economic challenges, very high unemployment rates or high inflation rates in a major economic crisis. Stanley Payne confirms that fascism in the 20th century was a product of war: “Fascism [...] was a direct product of the war itself. Neither a fascist party nor a fascist doctrine existed as such before 1919”. (Payne, 1983)

If the country is in such a crisis, the masses experience unprecedented hardship and acquire the appetite for protest and political organization. This is the critical condition that enables totalitarian movements according to Hannah Arendt:

“Totalitarian movements are possible whenever there are masses who for one reason or another have acquired the appetite for political organization. Masses are not held together by a consciousness of common interest and they lack that specific class articulateness which is expressed in determined, limited, and obtainable goals. The term masses applies only where we deal with people who either because of their sheer numbers, or indifference, or a combination of

both, cannot be integrated into any organization based on common interest” (Arendt, 1951)

Societies are particularly vulnerable after the collapse of empires and kingdoms, which happens frequently (Tainter, 1988). In this critical situation old institutions no longer work and many citizens long for the old power and strength. In combination with an ethical, moral and legal vacuum in a collapsed society, these are decisive factors for the development of malignant cultural tumors. A recent example is the chaotic situation after the collapse of the Soviet Union which led to various authoritarian regimes (Glenny, 2008).

Other examples are France after the collapse of the French kingdom in the French revolution, Germany after the collapse of the German empire in the aftermath of WWI, or Russia after the collapse of the Russian empire during the Russian revolution. It is not hard to see that it takes on average 10 years until a kind of fascism emerges after the collapse of an empire or kingdom.

Empire / Kingdom	End of Empire	Dictator	Fascist movement
French Kingdom	1789	Napoleon since 1799	French Bonapartism
German Empire	1918	Hitler since 1933	German Nazism
Italian Kingdom	1919 (de facto)	Mussolini since 1922	Italian Fascism
Russian Empire	1917	Stalin since 1922	Russian Communism
Soviet Union	1989	Lukashenko since 1990, Putin since 2000	Authoritarianism in former states of Soviet Union

Dictators of fascist movements often come from the periphery of the empire. Napoleon became French emperor but was born in Corsica, Stalin became dictator of Russia but came from Georgia, and Hitler became dictator of Nazi Germany but was born in Austria.

In all three cases, the dictators headed a movement that suppressed successfully all other political movements and then expanded aggressively into neighboring territory. The leader of the fascist movement promises a national renewal, a

national rebirth after the preceding crisis. What is actually born is a tumor that has the potential to destroy the society completely.

In biological systems certain risk factors must be met before a malignant tumor appears. For cultural systems it is similar. Jessica Stern listed risk factors for the example of terrorism. She mentions **alienation** and **humiliation** (Stern, 2003). For fascism in general and its various types we can observe alienation and humiliation as well, as Robert Paxton has observed (Paxton, 2004). As additional risk factors we can add an ethical or **moral vacuum** and a longing for old strength.

After the disastrous World War I, all of Europe was weakened and tumbled into an existential crisis. Whole countries experienced alienation and humiliation, the same risk factors that can lead to terrorism. Kingdoms, empires and monarchies that still existed before the war had collapsed, and from the ruins various fascist movements emerged: in Italy the Italian Fascism developed, in Germany we got Nazism, in Russia Stalinism and later Soviet Communism.

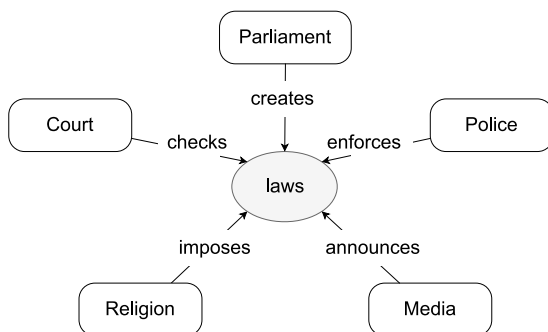
All of them linked politics and religion (Gentile, 2001), used propaganda and censorship (Stanley, 2015), a single party system and the violent oppression of opposition using dictatorial force (Linz, 2000). In all three countries a dictator came to power that established a single party system. A single party system in politics has just a monopoly in the economy negative consequences because it allows no alternative, no competition and no choice. If the single party system invades foreign territory and different systems, for example the economic systems, the religious system or the media, then we can speak of a cultural tumor.

Organisms basically arise from stem cells. For social organisms it is not different. To be able to rejuvenate, society and especially political systems allow the founding of new parties and new movements. A new party can emerge from an ideological or religious stem cell, when a founder proposes a new ideology.

In ancient societies, religion imposed the laws we had to follow. As we have seen in earlier chapters, the fundamental laws are basically the genes that create a society. The system that creates and administers first was assigned to special royal families. In the Medieval Period the kings at their royal courts created the laws.

Today most modern democracies have a complicated legal system which administers the laws, while kings and religions have lost most of their power. If we look for genomic changes that lead to tumors, we can expect to find them here in the legal system, for instance if an authoritarian ruler destroys the whole system because he wants to rule like a king, which is sadly still happening (Kendzior, 2020).

Herbert Hart describes in his book “The Concept of Law” (Hart, 2012) law as a legal system, which would require two minimal conditions: First there must be rules of behavior which have to be obeyed. He calls these laws primary rules. Primary rules impose obligations or duties and guide or control behavior. Second there must be secondary rules to organize the legal system itself. These secondary rules have to be accepted by its officials. They describe how to resolve uncertainty, how to settle disputes, and how to change the rules. These secondary rules replace the shared beliefs or kinship that keeps small social groups together.



In modern societies powers are separated and the secondary rules have been assigned to different actors. Modern democracies are defined by separation of powers in a legislative, an executive, and a judiciary branch which administer the laws. The legislative body is the parliament, the executive body is the government which supervises the police, and the judiciary body is the system of courts, judges and lawyers that resolve uncertainties. In addition we have the media that announces laws and their violations.

- parliament (legislative): introduces new **laws** or eliminates old ones
- police (executive): enforces the **laws**
- courts (judiciary): checks violations of **laws** and settles disputes
- news (media): resolve uncertainty what the **laws** are

Remember that laws are associated with the genes that created the society. In tumors this genetic machinery goes awry, when a stem cell proliferates and takes control of the whole legal system. The two stem cells for cultural tumors are first the family as the biological and cultural unit, and second the religious group as fundamental ideological unit. As long as there are families and religions there will be cultural tumors that emerge from them.

The **family** is the stem cell for all social groups that are based on biological kinship. A family is composed of a number of closely related persons who live in the same house or local region. Multiple related families can grow into a clan or tribe. A clan is a number of related persons, who live at the same place, stick together, and celebrate together. A family can be the stem cell for a new family business, but it can also lead to nepotism or organized crime. And it can be the root for a royal dynasty which rules over an **authoritarian** system.

The **religious group** is the stem cell for all social groups that are based on spiritual kinship, i.e. on ideologies. A religious group or ideological movement can develop into a radical party or a religious sect. In the worst case the movement grows exponentially and turns into a party which rules in a **totalitarian** single party system.

	Authoritarian system	Totalitarian system
Stem cell	Family stem cell	Religious stem cell
Ruling group	Family & clan	Party & movement
Connection	Kinship & loyalty	Ideology
Propaganda for	Ruler & ruling family	Ruler & party or movement

The family as the biological group is the fundamental biological unit of replication; the religious group is the fundamental ideological unit of reproduction. Both are fundamental, because they produce nothing but themselves. The family generates new families, and religious groups do nothing except producing themselves. Luhmann and others called this phenomenon of self-reproduction Autopoiesis (Luhmann, 1984).

The religious group is the stem cells for new religions, new political parties and other ideological groups and movements. The family is also the stem cell for family businesses, royal families, dynasties but also for criminal organizations. One example is organized crime which emerges from the stem cell of the family. It can also be seen as a malignant tumor in society, especially if it is linked to political power or a strict ideology. Criminal syndicates are often ruled by individual families, similar to the royal dynasties in medieval Europe. The members adhere to a set of rules, the code of honor. This set of rules can in turn be interpreted as a collection of cultural genes that help to create the group and maintain its integrity.

David Sloan Wilson says “small groups are a fundamental unit of human social organization” (Wilson, 2019). We can distinguish between two fundamental types: the religious group which follows a shared ideology and shares common cultural genes, and the family that shares common biological genes. These two are the two stem cells for society. These two stem cells produce continuously new instances of themselves. Religious groups get new members, grow to bigger groups and create new religious groups by missionaries. Families get children, grow to bigger families and create ultimately new families. Both basically reproduce themselves.

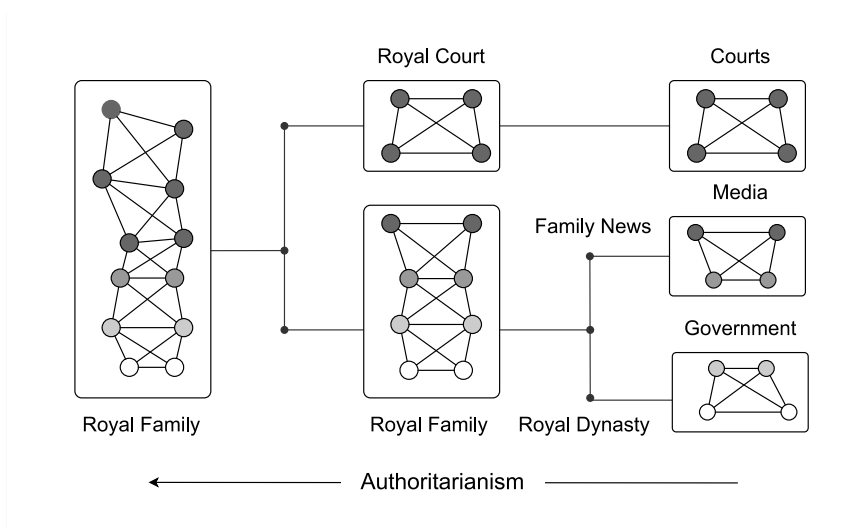
In the political system these two stem cells can lead to authoritarianism and extremism, and in the extreme case, to sultanism and totalitarianism, respectively. Authoritarianism ranges from mild and progressive forms to degenerated and severe forms of sultanism. Juan Jose Linz calls authoritarian regimes which are solely based on personal ideology and personal favor to maintain the autocrat in power “Sultanistic Regimes”. They are the most extreme authoritarian regimes marked by a lack of institutions and the absence of the rule of law. Linz says:

“We encounter a few regimes based on personal rulership with loyalty to the ruler based not on tradition, or on charismatic qualities, but on a mixture of fear and rewards to his collaborators. The ruler exercises his power without restraint at his own discretion and above all unencumbered by rules or by any commitment to an ideology or value system.” (Linz, 2000)

And he argues that the family plays an essential political role in these authoritarian systems. Linz says “the family of the ruler often plays a prominent political role, appropriates public offices, and shares in the spoils” and argues that the staff of authoritarian rulers is an “extended” family which is absolutely loyal to the ruler:

“The staff of such rulers is constituted [...] largely by men chosen directly by the ruler. They are neither 'disciples' nor old fighters of a movement party or conspiratorial group. They are often men who would not enjoy any prestige or esteem in the society on their own account but whose power is derived exclusively from the ruler. Among them we very often find members of his family, friends, cronies, business associates.” (Linz, 2000)

In authoritarian systems we have typically ruling families. The ruler and his family in authoritarian systems have absolute authority and demand unconditional loyalty. Families solve a core problem of authoritarian systems: power-sharing (Svolik, 2012). It is easier to obtain loyalty from family members than from ordinary people because they will always remain family members.



Authoritarianism claims the ruling family and its leader are superior and the only one that can really rule the country. In authoritarianism the three branches of government, the judicial, legislative and executive branches (i.e. courts, parliament and government) plus the media which reports about the government are either PR or family news are under the control of a single authoritarian ruler and his “royal family”. Nobody is allowed to criticize the ruling family, and the ruler is often subject to a personality cult. Many authoritarian systems are stable because numerous members of the royal family are given important positions in the government bureaucracy (Herb, 1999).

Propaganda in authoritarian systems can lead to increased privatization, as Jacques Ellul argued (Ellul, 1973). The reason is that it allows the leaders to do what they want if people are totally uninterested in political matters. Citizens who are uninterested in political questions do not question the legitimacy or authority of the leadership. Therefore authoritarian regimes actively discourage people from getting involved in politics.

Ellul writes: “One of the most remarkable weapons of the authoritarian State is propaganda that neutralizes and paralyzes its opponents (or all of public opinion) by reiterating a simple set of “truths” such as that the exercise of political power is very complex, and must therefore be left to professional politicians, that participation in political controversy is dangerous — so what good does it serve? ... Why should individuals involve themselves where power is exercised in the name of all and in the public interest? ... Individuals receive their comfort, well being and security from the State - it alone can plan ahead and organize” (Ellul, 1973).

This form of group narcissism for families was typical for royal dynasties in the Middle Ages. The royal families in Europe claimed for a long time the divine right to rule until the early 20th century, although the family members of a royal dynasty are in no way better suited to rule than others in a modern society where everyone has the duty and ability to go to school. If we follow this idea that some families are better than others, and apply it to a larger (sometimes imaginary) group such as clan or race, we are not far from racism.

The other form of stem cell is the religious stem cell. In political systems it leads to extremism (in weaker form) and totalitarianism (in stronger form) which claim that the ruling party is great and the only one that benefits the country. In totalitarian systems we have a single ruling party. The ruler and his party have absolute authority. Citizens are not allowed to criticize the ruler and his party.

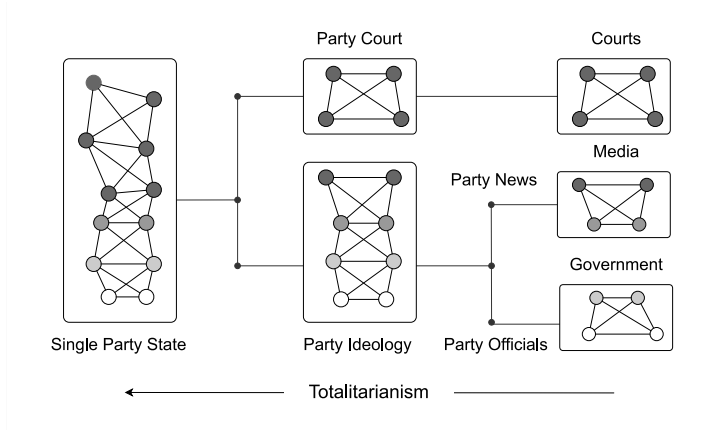
Religious stem cells lead to religions, ideologies, political parties and social movements. In totalitarianism, government, politics and media are all controlled by one single ruling party.

- The **family stem cell** that claims the ruling family is great leads to authoritarianism
- The **religious stem cell** that claims the ruling party is great leads to extremism and totalitarianism

In totalitarianism the three branches of government, the judicial, legislative and executive plus the media are under the control of a single party which controls the whole state. The media reports about the government are either PR or propaganda for the party.

Hallmarks of a totalitarian system are according to (Linz, 2000): “(1) a totalist ideology; (2) a single party committed to this ideology and usually led by one man, the dictator; (3) a fully developed secret police; and three kinds of monopoly or, more precisely, monopolistic control: namely that of (a) mass communications; (b) operational weapons; (c) all organizations, including economic ones, thus involving a centrally-planned economy”.

Whereas authoritarian systems demand loyalty only to the authoritarian ruler, and leave a bit of personal freedom, totalitarian movements demand total loyalty. Hannah Arendt says “Totalitarian movements are mass organizations of atomized, isolated individuals. Compared with all other parties and movements, their most conspicuous external characteristic is their demand for total, unrestricted, unconditional, and unalterable loyalty of the individual member.” (Arendt, 1951)



They demand total loyalty because it is the psychological basis for total domination: “Such loyalty can be expected only from the completely isolated human being who, without any other social ties to family, friends, comrades, or even mere acquaintances, derives his sense of having a place in the world only from his belonging to a movement, his membership in the party.” (Arendt, 1951)

The totalitarian movement tolerates no other party, movement or organization. As Arendt says “the true goal of totalitarian propaganda is not persuasion but organization”. The goal is the organization of a totalitarian movement that becomes a totalitarian party in a single-party state.

Propaganda is used extensively both in totalitarian and in authoritarian systems: in authoritarian systems to build up a personality cult and to convince people that they should not engage politically, and in totalitarian systems to build up a totalitarian movement and to convince people to participate in it (Arendt, 1951).

Jason Stanley distinguishes between creative and supportive propaganda on the one hand and destructive and undermining propaganda on the other hand. He argues propaganda is in the service of either supporting or eroding ideals (Stanley, 2015).

In totalitarian systems propaganda creates and maintains a totalitarian party, while it suppresses all other movements, organizations and parties, and it undermines the political ideals of civil rights, parliamentary democracy, and personal liberty.

In authoritarian system propaganda creates only the personality cult of the leader and his family, while it suppresses and silences all critics, parties, movements and organizations that dare to criticize the leader and his family, and undermines the political ideals of civil rights, and parliamentary democracy.

Both types of systems destroy like a biological cancer the old system that produced them, by undermining the political ideals and destroying the political order where peaceful opposition and criticism is possible (Sternhell, et al., 1994).

The difference in propaganda between these two systems is that in totalitarian systems people are encouraged to participate in the public activities of state, because the state is identical to the party, while in authoritarian systems people are encouraged to avoid participation in public issues of the state.

Propaganda in totalitarian systems encourages people to participate in the activities of the organization, party or group in question, it arouses passions to devote themselves completely to the organization, and to become an active member. In extreme forms, privacy is nearly erased and group activities are the duty of all members.

Gene expression in social systems occurs through communication. This means that mass media enables the creation of massive organizations because it enables communication with the masses. It enables the creation of totalitarian organizations on a massive scale.

For example, ubiquitous radio receivers ("Volksempfänger") and the fully controlled press have made a significant contribution to the rise of the National Socialists by continuously spreading Nazi propaganda. In Italy, the newspaper "Il Popolo d'Italia" ("The People of Italy"), founded by Mussolini, helped to bring fascism to power. Mussolini had started his career as editor-in-chief. The radio helped to spread the Mussolini speeches too.

When does a state which has normal laws become a totalitarian state?

Hallmarks of totalitarian systems are (Linz, 2000): it is a single-party system where the government has total control over all systems (economy, media, religion, cultural organizations, etc). There is no freedom of press and no freedom of religion, and the amount of censorship and propaganda is very high.

In a totalitarian system, only one social organism is allowed: the ruling party itself. All other social organism, all religions and all organizations have merged into it. It is maintained by constant propaganda and conserved by censorship. A totalitarian ideology claims to explain everything, why people are unhappy and in a miserable condition, and how to make a country great again.

Arendt defines a totalitarian movement as a mass organization that demands total loyalty (Arendt, 1951): “Totalitarian movements are mass organizations of atomized, isolated individuals. Compared with all other parties and movements, their most conspicuous external characteristic is their demand for total, unrestricted, unconditional, and unalterable loyalty of the individual member.”

Since this totalitarian movement as a single organism touches nearly every aspect of society and incorporates many different sub-systems, it has naturally many opponents, especially in surrounding countries. Therefore if it wants to grow and prosper this leads often violence and war. If a dinosaur like a T-Rex would appear today, numerous Hollywood movies have shown us that it would be an immediate threat. In a similar way the totalitarian social organism that emerges from fascist movements is often fought from all sides (for instance by economic sanctions) because it was not well-adapted to the environment and an immediate threat. Collectivization and nationalization that are typical for various forms of fascism are threats for international corporations.

Robert Paxton argues fascism is by definition characterized by internal cleansing and external expansion (Paxton, 2004):

“Fascism may be defined as a form of political behavior marked by obsessive preoccupation with community decline, humiliation, or victim-hood and by compensatory cults of unity, energy, and purity, in which a mass-based party of committed nationalist militants, working in uneasy but effective collaboration with traditional elites, abandons democratic liberties and pursues with redemptive violence and without ethical or legal restraints goals of internal cleansing and external expansion”

In the times of fascism under the rule of Mussolini, Italy aggressively expanded to Libya, defeated it and set up concentration camps there. Nazi Germany followed this model on a much larger scale in Europe, and also set up concentration camps in the occupied territories, which spread like metastases across Europe. The result of Hitler's actions is well known. Fascism and National Socialism invasively spread to neighboring regions like a malignant tumor in biological organisms. In fact they were malignant tumors.

If we look back on development of the Roman Republic to the Roman Empire, we can observe a number of factors: a large number of jobless war veterans which had to be supplied, an economic crisis after a large war, a yearning to make the country great again and finally a fallback from the Republic form of government to the time of dictatorship in kingdoms. The veterans that had returned from the war had no income and no work (Woolf, 2015). In principle these are similar factors that led 2000 year later to the appearance of fascism in Italy and Nazism in Germany.

In hindsight history is much easier to understand. Fascism, soviet communism and Nazism were based on a radical ideology, had a strong religious component (Gentile, 2001) and were characterized by a close connection between religious systems, economical systems and political systems where one single party dominated everything else (Arendt, 1951).

If both religion and radical political parties are based on genes, cultural genes, which are read and explained in long speeches at rallies and congresses, then there is no longer a big difference between party congress and church congress. If religion and politics merge, even though they already existed as separate systems, then they become one unit: party congress and church congress fall together, party and church become indistinguishable, and party ideology merges with religious ideology. A cultural tumor has emerged. In a highly developed and highly differentiated society, this is the way towards war and conflict, because such a structure can only survive through aggressive behavior.

To sum it up whenever a country is in a crisis, the old order has collapsed, and the masses experience unprecedented hardship, we can get a new cultural tumor if one of the stem cells that are normally used to regenerate a society degenerates, grows aggressively and longs for total domination.

If the political system is completely broken then we often get a family stem cell that grows into an authoritarian system where a dictator demands total loyalty for himself and his family or ruling clique.

If the political system remains intact and if there are masses which acquire the appetite for protest and political organization, we often get a religious stem cell that grows into a totalitarian movement and degenerates into a totalitarian system where a dictator demands total loyalty for the single-party system.

TERRORISM & FASCISM

We have defined **fascism** as the most general form of a cultural tumor. Once it has reached a certain size and stage it leads to terror, **terrorism** and war. Let us have a look in this chapter how fascism and terrorism are related.

Without loss of generality we consider the worst case of totalitarianism. Similar arguments apply for colonialism, imperialism and other less strict forms of fascisms.

Totalitarianism in power is different from totalitarian movements, as Hannah Arendt observed. A totalitarian movement can disregard the facts and invent a fictitious world where it is totally justified. Once it has governmental power, it has responsibility and can no longer ignore reality. It is no longer enough to say what it does not want, it is necessary to say what it wants. For a totalitarian system this is a problem, because as we have seen in the last chapters, fascism is an abstract form of a primitive, radical ideology, which defines itself in terms of what it is not, for example antisemitism which is hostility to or prejudice against Jews. A government can no longer merely protest, it has to govern the country. For a totalitarian system this can be difficult (Arendt, 1951):

“Its disregard for facts, its strict adherence to the rules of a fictitious world, becomes steadily more difficult to maintain [...] Propaganda and organization no longer suffice to assert that the impossible is possible, that the incredible is true, that an insane consistency rules the world”

When people then start to criticize the totalitarian system, and threaten the existence of the single-party state, it leads to terror or war or both. This kind of terrorism is exercised by small groups that have a radical ideology. They spread terror and fear by violent attacks. Terrorism tries to shatter the authority of the state, which legitimates its existence partially by the ability to maintain the security of the citizens (Townshend, 2018).

Both groups are based on a radical ideology and see fear, violence and physical force as a legitimate means to reach their goals. Both groups fight against each other by using violence which causes pain and suffering: fascism uses secret state police and state violence to fight terrorism (Greitens, 2016) , while terrorism uses terror attacks to rebel against an illegitimate state. Terrorists fight against fascism using violent terror attacks, while the government in fascism uses torture to fight against terrorists. In a democratic state, torture creates difficult ethical debates and moral questions (Luban, 2014).

The victims of this fight are innocent civilians. According to Jessica Stern terrorism is the fight against innocent and unarmed civilians which causes fear, dread, scare and terror (Stern, 2003). Religious militants kill to fight for their organizations and use religion both as motivation and justification. Terrorism is the rule of terror, and terror organizations use fear to obtain power.

The suicide bomber that sacrifices his life for his organization or religious group is making the highest sacrifice a group member can make, like the martyr that dies for this faith. Just as the priest that obeys celibacy, from the point of view of the genes for the religious group that is wonderful, but for the own genes of the individuals it is catastrophic.

Terror can be caused by the state itself, for example in authoritarian or totalitarian systems, or by an individual from a stateless organization. These stateless organizations are often based on religious sects or splinter groups. The family often plays a big role (Sageman, 2004).

In terrorism the terrorist makes a terror attack which terrorizes the powerless group. In fascism the group uses the security agencies to terrorize the powerless individual. We can say **terrorism is terror of the individual from the perspective of the group**, while **fascism is terror of the group from the perspective of the individual**. In both cases fear and terror is spread among ordinary citizens in order to increase obedience and loyalty (Townshend, 2018)

In fact terrorism is the only way to fight a superior superpower once it has emerged. Once a superior imperial superpower as developed, whether by imperialism, colonialism, nationalism or totalitarianism, it has no longer natural enemies and it is hard to attack it directly using large troops. It can be attacked by single, disguised actors in sudden surprise attacks, though - acts of terror in a guerrilla warfare. In this sense terror can be seen as an adaptation, as a response to the tyranny of imperialism or the injustice of totalitarianism from selfish global superpowers.

Why is violence so common in both large fascist organization and small terror groups? The original fascism in Italy and Nazism in Germany were both based on violence. If violence is seen as legitimate tool of debate (for example directly after a war where violence is ubiquitous) and if an ideology becomes so extreme it leads to closed world view, then violence often remains the only option to achieve the own goals, because it is impossible to make compromises without tolerating other opinions and respecting those who think differently.

If organizations start to terrorize people, they feel threatened in their existence, as we examined in one of the previous chapters. Social organisms are afraid of revolutions are able to cut off their own roots, because critics and reformers can create a new organism that grows from the same roots and threatens the existence of the old organism. Then they react by merciless terror that can turn

an organization of love in the opposite: a terror organization that has cruel capital punishments. The Spanish Inquisition of the Catholic Church, the human sacrifices among the Aztecs, and the crucifixion of the Romans come to mind. A modern example is Liu Xiaobo, who was terrorized and threatened by the totalitarian Chinese government because he dared to criticize the single-party system.

From the perspective of the individual, fascism tends to destroy the old political order where peaceful opposition is possible (Sternhell, et al., 1994). If it has destroyed the old political order successfully, so that peaceful opposition and criticism is no longer possible, then the only possible way of opposition is violence.

However there is a clearly a link between religions and terror. All big monotheistic religions have created terror organizations, even the Christian religion which is based on love. For instance we know the Spanish inquisition and the burnings of heretics in the Middle Ages, and there also have been radical Christian groups like "The Covenant, The Sword, and the Arm of the Lord" (CSA) in more recent times, as Jessica Stern explains (Stern, 2003). Big religions terrorize heretics if they feel severely threatened, and rebels can terrorize an empire if they feel suppressed and threatened too.

PREVENTION OF TUMORS

Italian fascism, German Nazism and Russian communism are history, and the cold war between American capitalism and Russian communism is over. The time of "isms" that have a strong religious and ideological component seems to come to an end. And yet if we take a closer look then the number of "isms" is rising. Can we prevent the appearance of cultural tumors?

The problem is: there will always be some form of crisis which is one necessary condition. As long as we have stem cells for cultural tumors we will most certainly have cultural tumors. The first stem cell is the family as a biological and cultural unit. It is a necessary stem cell to create new family businesses in the economy and to maintain the human race as a whole. The

second stem cell is the religious group as fundamental ideological unit. It is necessary to create new parties and new movements in society. As long as we have these two stem cells, families and religions, we will have new cultural tumors.

Edward Bernays predicted about 100 years ago that PR and propaganda will always exist (Bernays, 1928). And he was right. PR and propaganda are everywhere, in form of advertising and marketing, or as propaganda in authoritarian systems all over the world. Propaganda and censorship have become more subtle and refined. As long as we have propaganda, there will be authoritarian and/or totalitarian systems.

Families give rise to autocratic rulers and organized crime families. Religions can be the source for radical ideologies and all sorts of fascism, because parties are just as churches organisms that are created by genes. They can get the same diseases like cancer and start to push all other organisms aside. The party becomes the only-party in a single-party state, and the religion can become a monotheistic religion that tolerates no other religion.

The world is still full of “isms”, large and small cultural tumors that can be malignant or benign, from small radical sects like the Islamic State (IS) to authoritarianism in the former states of the Soviet Union and new forms of totalitarianism by mass surveillance in China and North Korea.

Unlike the Soviet Communism, Chinese Communism still exists, although it is no longer a communistic state. It is a totalitarian one-party state that is so contradictory that it makes you wonder why it exists at all (Rocca, 2015). We can consider it as a totalitarian system because it shows all signs of a totalitarian system mentioned by Juan José Linz:

“(1) a totalist ideology; (2) a single party committed to this ideology and usually led by one man, the dictator; (3) a fully developed secret police; and three kinds of monopoly or, more precisely, monopolistic control: namely that of (a) mass communications; (b) operational weapons; (c) all organizations,

including economic ones, thus involving a centrally-planned economy” (Linz, 2000):

Soviet Communism is gone since 1989, but according to Garry Kasparov the country is heading away from democracy towards an autocratic rule (Kasparow, 2015). We can observe the hallmarks of fascism: ubiquitous propaganda, military expansion in Georgia (2008) and Ukraine (2014), and merging of systems (nationalization of companies and no separation of powers). Russia and other former states of the Soviet Union have developed a form of authoritarianism as Misha Glenny explains (Glenny, 2008).

Even America is moving towards authoritarianism now as Sarah Kendzior has described well (Kendzior, 2020). At the time of writing it is not clear where America is headed and where this development will end.

Despite these concerning developments, not all cultural tumors must be prevented at all costs, because there are also benign tumors that do not invade nearby territory aggressively. How can we prevent cultural tumors, especially in the democratic countries of Europe and America?

Most people not want to live in a totalitarian world or cruel dictatorship that does not leave enough air to breathe, where you can end in prison if you criticize the government and where you have no freedom of speech, freedom of movement or freedom of the press.

One way is to impose a threshold for elections that makes it more difficult for new radical parties to gain ground. An example is the 5% threshold for the German parliament or the 4% threshold for the Austrian parliament.

Another way is to monitor political candidates and new parties if they are not criminal and adhere to the constitution. In principle every small radical party can grow until it is the only party in a single-party state, thereby destroying the political order. This can be prevented if the candidates who are criminal and the parties that violate the constitution are forbidden in an early stage, so that they do not become a threat to the whole system.

Both ways prevent like chemotherapy in biological systems the generation of new cells that have the potential for malignant development.

Additional measures are to strengthen the judiciary system, which is very important because it helps to preserve the democracy. It is the foundation for the immune system of our society (Luhmann, 1984). Together with the police it detects foreign objects that violate the rules of the system and threaten the integrity of the system.

	Genes	Foreign objects	Immune System
Biology	Genes	Viruses, Bacteria	Immune System
Religion	Commandments	Texts of heretics	Inquisition
Society	Laws	Criminals and thugs	Justice and police
Politics	Constitution	Texts of radical parties	Justice
Economy	Market rules	Monopolies	Justice and government

Timothy Snyder thinks that we can learn from the horrors of the past if we want to protect our democracies. He has listed 20 points that can help to prevent the growth of a new kind of fascism, authoritarianism and totalitarianism (Snyder, 2017). Snyder’s list includes the points

- Do not obey in advance
- Defend (democratic) institutions
- Beware the one-party state
- Remember professional ethics
- Be wary of paramilitaries
- Believe in truth

Among the democratic institutions that we have to protect society from tumors are the free press and an independent judiciary system.

Finally we can try to reduce the classic risk factors for both fascism and terrorism: alienation and humiliation which occur when people are in a major crisis because they lose their job, their family or their health. As trivial it may sounds, if we attempt to reduce injustice and to increase health, for example by better health care or a basic income for all, then we reduce the risk factors for fascism and terrorism.

PROOFS & CONSEQUENCES

CONFIRMABILITY

Can we prove the main thesis of this book, that the holy books contain cultural genes, and that these genes are expressed during church services? Can we prove that a religious group is a phenotype of a certain genotype, at least if it belongs to the big monotheistic religions? It must be very difficult; otherwise someone would have already done it already.

Proof by Contradiction

We can try to outline a proof by contradiction (in logic known as “reductio ad absurdum”) that a religious group is a phenotype of a certain genotype which goes like this:

First we assume there are no cultural genes in a religious organization like the church. This means there is no information encoded in any material which belongs to the organization itself, no stories which are linked to its history or verses that contain fundamental instructions. This is obviously a contradiction to the fact that holy books exist, which are passed from generation to generation and contain the story of the group.

Second we assume there are cultural genes, but they are not expressed. This means that holy scripts exist, but nobody reads them regularly at a special day of the week, month or year. This is obviously a contradiction to the fact that mandatory holy days where parts of the holy books are read and translated regularly exist in all big monotheistic religions.

Third we assume there is a cultural gene expression, but it has no effect. This means that holy scripts are read on holy days, but they have no effect whatsoever on individuals of the group or the group as a whole. This would mean on the individual level that people cannot be persuaded by speeches to change their behavior. This is not true, because we know well that propaganda can be effectively used to persuade people (Taylor, 2003) and as we have seen

in the last chapters, cultural gene expression is nothing else: the use of propaganda techniques to change people's attitude, beliefs and opinions.

This is the basic proof by contradiction that there are cultural genes which contain fundamental instructions that are expressed regularly and have a constitutive effect on the social fabric of the religious organization. It is quite simple if you know where to look.

Genotype & phenotype are known

Thus we can say we have clear evidence that religious groups are based on hidden genes, because we know

- the genotype (the laws & commandments)
- the phenotype (the religious group)
- the phylogenetic tree

We even know the way how the genes are expressed: cultural genes are expressed in general by propaganda, in speeches and in regular divine services, and especially by the sermons in the church services. The path of gene expression is already well known, it is characterized by the holy objects that belong to the group itself: the holy books which are expressed regularly on holy days result in a holy spirit among the group. The attribute "holy" marks the pathway of gene expression.

The basic principles are in fact amazingly simple: we know that the genes from a genotype generate a phenotype. We know both the genotype and the phenotype. We know that the genotype is read repeatedly, and that this information is used to construct the phenotype. What we do not know exactly is how the genes are building the phenotype in every detail. We do not know this for biological genes either. It is incredibly complex because we are adaptive life-forms living in a complex and constantly changing environment, and it is nearly impossible to predict if a concrete word we hear in a speech will affect our actions in a particular situation later. It is incredibly complex and yet amazingly simple at the same time.

Phenotype is generated from genotype

How do we know that the phenotype, the fabric of the group, is generated from the genotype? If the phenotype is the collective group, we just need to know that the members of religious groups follow the rules and commandments in the holy books.

It is obvious that the laws in the holy books are followed by the members of a religious group, because it is required for all members to obey the laws of the group. This means that the laws and commandments have certainly an effect on the actions of the group members, because it is mandatory to obey them. Members who do not obey the laws are expelled or excommunicated.

The common understanding is that religions are about faith and abstract beliefs, about the abstract things we believe and the subjective experiences we make. Normally the focus is on the beliefs, and not on the actions. If we shift the focus from perceptions to actions the laws become more important, and we can measure the effects, for example how much properties like trust in the group change.

Abstract beliefs only have a measurable effect if they lead to specific actions. Actions have a concrete effect in this world. They can have a constructive or destructive effect, they can increase or decrease the size of a group, and they also can create or destroy abstract things such as trust.

The first evidence is that the phenotype is generated from the genotype is that the religious groups which have the most genes against violations of trust have indeed the highest trust among members. The commandments to prohibit lying and stealing act against violations of trust, i.e. they increase trust, which is an essential part in the fabric of any society. There is indeed a strong correlation between trust and religious affiliation, as repeated studies have shown, for example (Guiso, et al., 2003) or (Kortt, et al., 2018). In other words people in religious groups believe usually that others in their group can be trusted, depending on the nature of the group.

The reason can be found in the genes or commandments that prohibit lying and stealing. Lying distorts the truth, and stealing damages property. Both are corrosive actions that destroy trust, a basic fabric of the religious group.

Stealing is forbidden in all societies. In the Jewish and Christian religion lying is strictly forbidden, since the prohibition of lying is one of the basic 10 commandments. In Islam dishonesty is forbidden but there are exceptions. In Hinduism there is no law or commandment against lying.

In the studies that examine how trust is correlated to religion, for example (Guiso, et al., 2003) or (Kortt, et al., 2018), we find indeed the highest values for trust in Judaism and Christianity, a lower value in Islam, and the lowest value in Hinduism. For Hinduism it is even negative in one study (Guiso, et al., 2003), which means that Hinduism decreases trust.

The second evidence is that genes determine the growth of the religious group. The religious groups that have the most genes for growth are the biggest. Various groups use different strategies, and the results differ. There about 2.5 billion people of the Christian religion (which has more than one “missionary gene”), but only 15 million people of the Jewish religion (which does not have such a “missionary” gene).

The simplest form of growth is inheritance from the parents. Boyd and Richerson quote Mark Twain who describes that Catholics are Catholics because they have inherited the faith and have been born and reared among Catholics, not because they have actively thought about it:

“We know why Catholics are Catholics; why Presbyterians are Presbyterians; why Baptists are Baptists; why Mormons are Mormons; why thieves are thieves; why monarchists are monarchists; why Republicans are Republicans and Democrats, Democrats. We know that it is a matter of association and sympathy, not reasoning and examination; that hardly a man in the world has an opinion on morals, politics, or religion that he got otherwise than through his associations and sympathies” (Boyd, et al., 1988).

For **Judaism** this kind of cultural inheritance is the primary source of growth. In Genesis 1:28 we have the commandment “Be fruitful and multiply and fill the earth”, and in orthodox and conservative Judaism a person is considered Jewish if the mother is Jewish. This means the more children a Jewish community has, the more it grows. Today we have about 15 million members.

In **Christianity** growth is not limited to the family, clan or tribe. Christianity belongs to the evangelizing religions. There are special genes for mission (for example in Matthew 24 & 28, and in Mark 13 & 16), which encourage missionaries to actively spread the faith around the world. This mission was not always peaceful, as the history of the crusades shows. The result is 2.51 billion members today. According to the numbers this strategy is the most effective.

In **Islam** growth is frequently associated with Jihad. Bernard Lewis says: “The Arabic word literally means striving, and it is often followed by the words 'fi sabil Allah', in the path of God. Until fairly recent times it was usually, though not universally, understood in a military sense. It was a Muslim duty [...] to fight in the war against the unbelievers” (Lewis, 1993). The phrase “fi sabil Allah” occurs quite common in combination with Jihad in the Quran.

Islam is like Christianity an evangelizing religion that tries to convert people and to win new followers. In the early era of Islam, military conquest of territories extended the realm of Islam to include millions of subjects. The conquest was inspired by religion, but it was also motivated by other factors such as politics and power. Lewis writes "for most of their common history, relations between the two communities [of Christianity and Islam] were shaped by attack and counterattack, jihad and crusade, conquest and reconquest". The result is 1.8 billion members today.

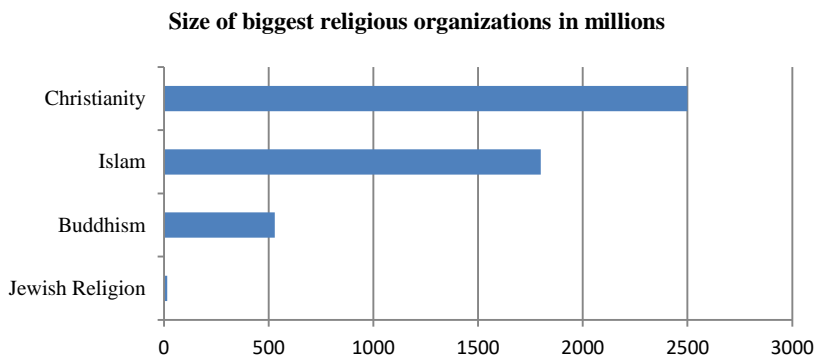
In **Hinduism**, the collective term for the various local religions in India, there is no law or commandment for mission or jihad. Proselytism, the act of religious conversion or actions which invite it, is alien to Indian religions such as Hinduism. Therefore it has never really spread beyond India, although the

various groups, subgroups and denominations have a significant number of followers. Buddhism is an exception.

In **Buddhism**, at least three of the canonical Buddha biographies contain a Great Commission passage. It is quite similar to the missionary genes of the Christian religion, for instance the Great Commission in Matthew 28:16–20, and says

“Go now, monks, and wander for the gain of the many, for the happiness of the many, out of compassion for the world, for the good, for the gain, and for the welfare of gods and men. Let not two of you go the same way. Preach, monks, the dharma” (Sangharakshita, 2014)

There about 530 million people that practice Buddhism today as a result of this missionary gene. To sum it up we can say those religions that have a large number of effective missionary genes also have the biggest size.



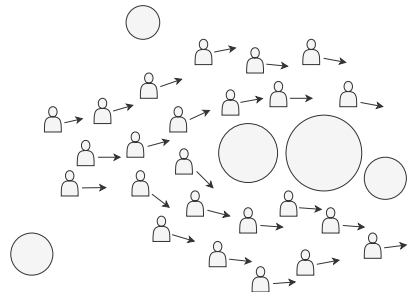
AGENT-BASED MODELS

There are basically two other ways to prove the thesis. The first way is to use agent-based modeling (Wilensky, et al., 2015). Agent-Based Modeling captures emergent phenomena and provides a natural description of human systems (Bonabeau, 2002). It can be really difficult, too, because humans and their behavior are difficult to model. We have multiple levels of causality for every form of behavior.

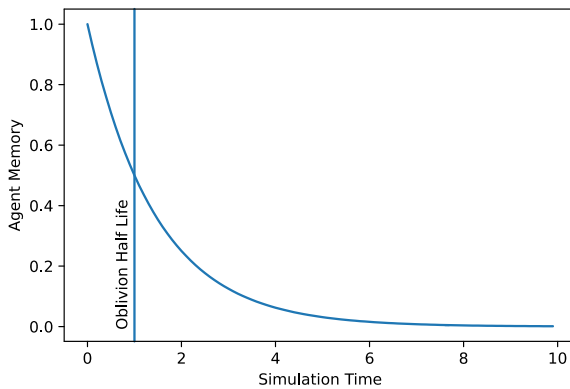
Nevertheless we want to look at these simple agent-based models. They are classic agent-based models which we slightly adapt or interpret for our purpose:

1. “Forgetful Swarm” model: what is the purpose of regular meetings and repeated assemblies, how often do genes have to be expressed?
2. “Fearful Swarm” model: what is the purpose of rituals in regular meetings and repeated assemblies?
3. “Trust & Deception” model: what is the purpose of the genes a.k.a. moral laws? Has their expression an effect on behavior and beliefs?
4. “Belief & Heresy” model: what effect has the belief that the own group is superior on the group?
5. “Wealth & Sacrifices” model: What is the purpose of sacrifices?

The first two are based on swarms. We have seen that the cultural genes of religious groups are isomorphic to the classic “Boids” rules used in swarm intelligence: stay close to the group, but away from your neighbors (Reynolds, 1987). Therefore swarms can be used as an abstract agent-based model of human behavior in large religious groups or movements in general.



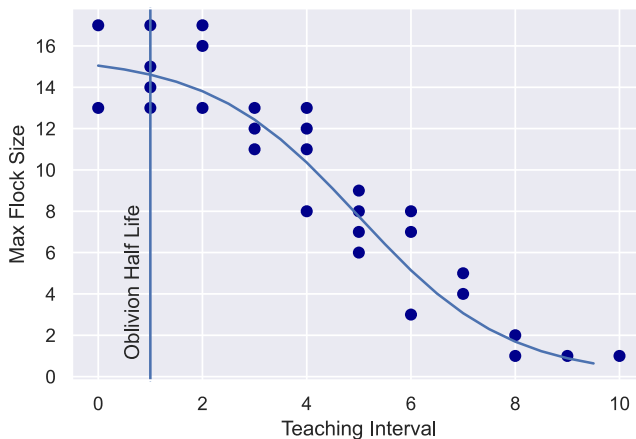
Let us first consider for instance the case where agents are forgetful. They know the rules to form a swarm, but tend to forget them, because they are distracted by the obstacles of daily life and memory tends to decline in general. This oblivion can be modeled simply by exponential memory decay, which results in a “forgetting curve”. After the half life time, the rules have been forgotten to 50%, etc.



If agents in a swarm tend to forget the rules (like “stay close to the swarm”), the swarm will eventually disintegrate, because they are no longer a movement in the same direction. The more obstacles it meets, the more it will disperse and disintegrate if it no longer obeys the rules. The movement disintegrates. Therefore we need to remind the agents in such a forgetful swarm which is subject to oblivion periodically of the rules in some form of teaching event, which corresponds to a political rally or a church service.

This considers every group meeting as an event where the disintegrating and decaying group is built up again. It is a simple agent-based model of group formation and disintegration among forgetful agents. As the time intervals between these reminders vary, how does the group react, how fast does it disintegrate if the agents forget the rules? How often do they have to be reminded of the rules to form a stable group?

The results of a simple simulation (for about 70 obstacles and 20 agents) indicate that the time between regular reminders should ideally be less or equal than the half life time of the memory loss for the agents. If the rules are expressed more frequently, then a coherent swarm will be able to form and remains stable, but if the rules are taught less frequently any existing swarm will disintegrate and a new coherent swarm will not be able to form.

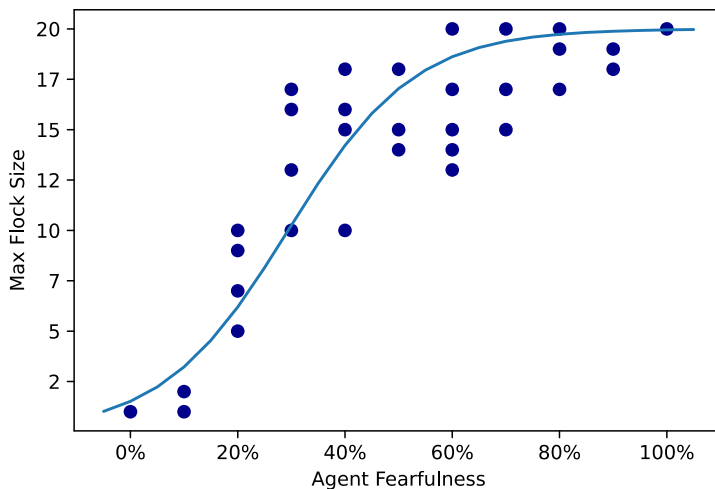


Thus if swarm rules are subject to decay and we need to express the rules more or less frequently, we are able to observe a phase transition at a certain threshold, the half life time of the memory loss. The threshold marks the phase transition from a strongly-coupled swarm phase to a highly individualized phase of isolated agents, and it is at the same time a tradeoff between the collective needs of the group and the individual needs of each agents.

Humans tend to halve their memory of newly learned knowledge in a matter of days or weeks unless they review and repeat the learned material. Assuming that the half life time of newly learned rules is about one week in the real world, this model indicates and confirms that a group needs to meet each week to ensure new rules are remembered corrected.

The second agent-based model is very similar to the first, but instead of forgetful agents we take this time fearful agents. In the “Fearful Swarm” model isolated agents experience fear. The basic idea is the common rituals in the group reduce basic fears, for example by the feedback illusions mentioned earlier. Fearful isolated agents therefore try to join a swarm because as part of the group they experience less fear. This tries to model the effect of rituals that give the members a feeling of strength and security and reduce their anxiety and fears. The group also protects the members from the threat of other groups or possible dangers of nature (such as predators and diseases).

In our model the agents have a fearfulness which ranges from 0% to 100%. A fearfulness of 0% means no fear at all and no desire to form a group if they meet another agent. 100% means absolute fear and very strong desire to form a group if they meet another agent. The swarm rules are followed 100%. As we increase the fearfulness of the agents, the swarms become bigger and the maximal flock size increases.



The first model simulates how a group disintegrates if the agents are too forgetful; the second model simulates how a group begins to form if the agents are too fearful (assuming that the group reduces fears by rituals). They are both based a simple swarm model where the rules are dynamic.

The third fundamental agent-based model we want to look at is a simple model for trust and deception among agents. In this model deception such as lying, stealing or betraying lead to a decrease of trust.

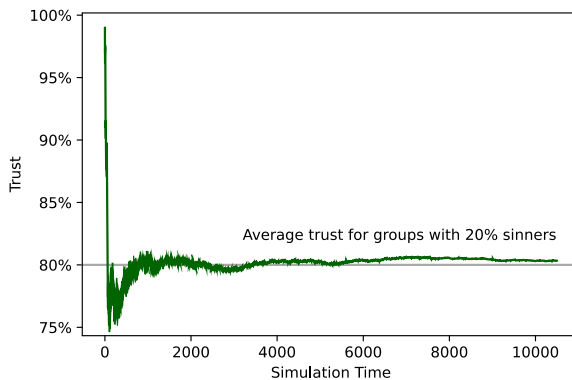
In the modern world this topic is difficult to study for two reasons, first because today many systems influence moral behavior so that we may not notice how strongly religion is really able to influence moral behavior. Religious belief is no longer the only moral guide. We learn the right behavior during socialization from our parents, in school, and even from crime movies in TV. There are strong secular laws that prevent theft and murder which supersede the old religious commandments. Second there is of course no ethical way to create a situation in the real world where theft and murder is allowed to study the effect of religious laws against theft and murder.

In an agent-based model it is much easier to study. Our model is inspired by the models from Robert Axelrod about the evolution of cooperation (Axelrod, 1984) and the complexity of cooperation (Axelrod, 1997). In our model agents interact randomly with each other, and each agent can choose in an interaction between cooperative (good) and uncooperative (evil) behavior.

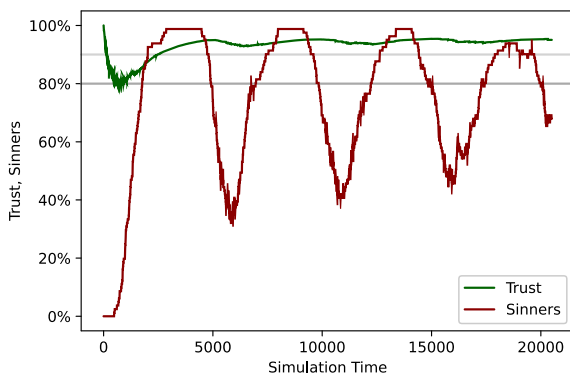
Unlike Axelrod we do not consider the potential payoff, but the effect on the beliefs of the agents. Each time an agent lies or betrays the opponent, the affected agent loses a bit of trust. The rule is simple: if an agent acts cooperative (for example by saying the truth), the trust is increased. If an agents acts uncooperative (for example by lying or stealing), the trust is decreased. Every agent has a memory how many times it has been betrayed.

Trust in this model is simply defined as the number of deceptions divided by the number of interactions for each agent. If we have random interactions

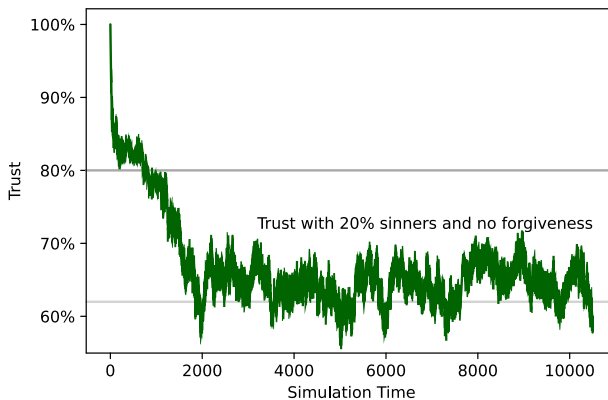
between 80% good agents who always cooperate and 20% bad agents who deceive every time (to model the evil sinners and bad criminals), the average trust level will obviously tend to approach 80%. Apart from random fluctuations, the trust level will equal the percentage of cooperative agents.



In addition we can use this model to show that punishment of sinners (e.g. by excommunication) or imprisonment of criminals can indeed increase trust in the total group. If we add an additional rule to the model that a sinner or criminal gets caught after deceiving x times and is then excommunicated or imprisoned for y time steps (here $x=5$ and $y=4000$), the average trust in the group increase significantly because the agents which break the trust are removed. If they return from prison or exile and start to deceive the group again, the trust is lowered again. This leads to small trust fluctuations.



Detecting and removing the agents who deceive has in general a positive effect on trust. We can use this model in the same way to show that retaliation and lack of forgiveness can decrease trust. If we add an additional rule to the basic model that a cooperative agent gets angry and hateful if it deceived more than x times and is then in a grumpy state of grudge or wrath for y time steps where it treats others badly by deceiving them (here $x=5$ and $y=200$), then the average trust in the group decreases significantly because the number of bad agents that deceive increases overall. The longer the state of grudge or wrath for the otherwise cooperative agents is, the higher the loss of trust. Forgiveness prevents this loss of trust, because it avoids circles of retaliation that arise from grudge, hate or wrath. The higher the forgiveness is, the higher the trust.



This simple simulation confirms what Ara Norenzayan has found. Norenzayan argues in his book that the three Abrahamic religions basically increase trust (Norenzayan, 2013). The “Big Gods” of the Abrahamic religions enabled the cooperation among strangers as long as they belong to the same religion, because these religions claim that supernatural all-knowing watchers demand passionate commitment, reward good deeds and punish every act that violates the laws, rules and norms of the community. The “Big Gods” would sustain large-scale cooperative behavior and trust among strangers, because those that believe in divine monitoring can be expected to act morally. He tries to back up his claim by evidence from psychology, anthropology, economics and history.

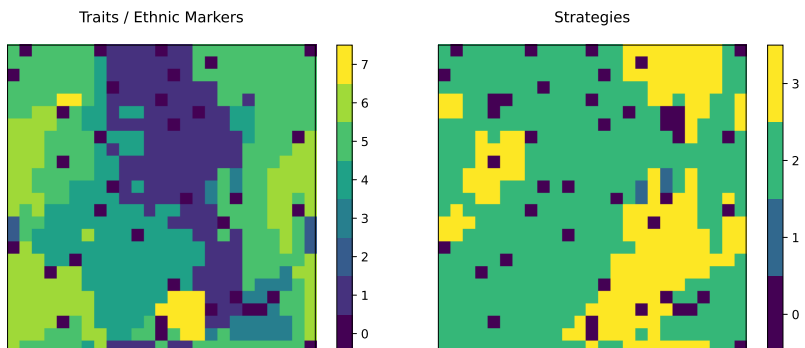
The simulation also confirms David Sloan Wilson who argues that forgiveness is an adaptation (Wilson, 2003). Forgiveness apparently has to increase trust in a society where TIT-FOR-TAT and “an eye for an eye” revenge is not uncommon. It helps to keep groups together. The law of retaliation (the revengeful principle which demands “an eye for an eye”) is in fact common in ancient Babylonian and Jewish cultures.

The first three agent-based models were related to oblivion, fear and trust. The next is based on beliefs. The agent-based model for “Belief & Heresy” is

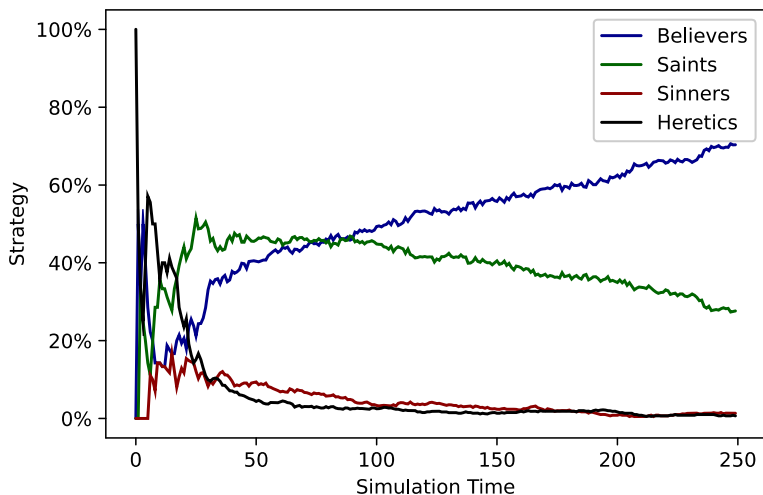
based on the classic model for “the evolution of ethnocentrism” from Axelrod and Hammond (Hammond, et al., 2006) which combines the cultural or ethnic markers from classic segregation models - Axelrod's model of local convergence and global polarization (Axelrod, 1997) and Schelling's model of segregation (Schelling, 1971) - with the evolutionary pay-off strategies from the classic prisoner's dilemma (Axelrod, 1984). It is an evolutionary model for the evolution of ethnocentrism, which is the belief that one's own ethnic group is superior to all other ethnic group.

Axelrod and Hammond show in their evolutionary model that cooperation within the own group but selfish behavior towards other groups - the “ethnocentric” strategy of favoring the own ethnic or cultural group - is a successful strategy for a group to emerge in a world of selfish actors. This strategy beats the other strategies. Due to the strong stochastic component in the model always evolves is a bit different, but the ethnocentric “believe in the own group” strategy always rises to be the most successful strategy.

The result of a simulation looks like this: on the left each color represents an agent of a certain ethnic group which has a specific trait or marker – similar to the ethnic markers in the model from McElreath, Boyd and Richerson (McElreath, et al., 2003), on the right the corresponding strategy.



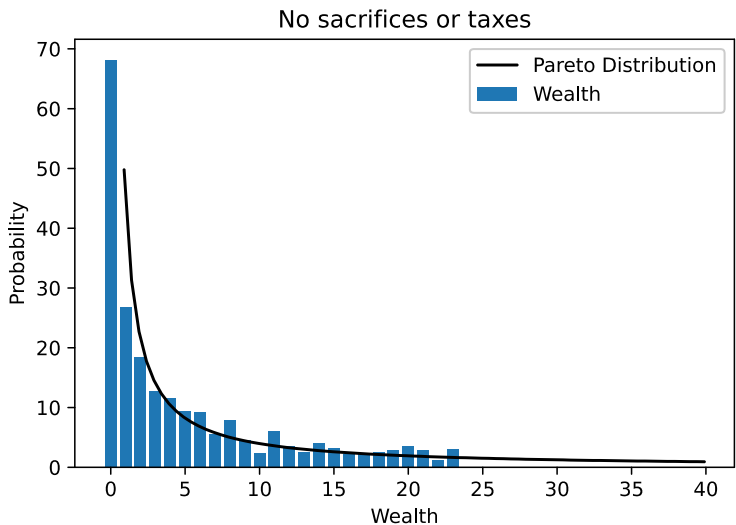
The four possible strategies from Axelrod and Hammond correspond to four possible strategy types. The different behavior patterns are: patriots (2) who believe in the own group can be identified with those who support the own group, but not others, traitors (1) who believe in other groups can be identified with those who support other groups, but not the own, cooperators (3) who always support everyone and defectors (0) who support none. These four types develop differently, in the model from Axelrod and Hammond ethnocentric “believers” rise quickly to top of the strategies.



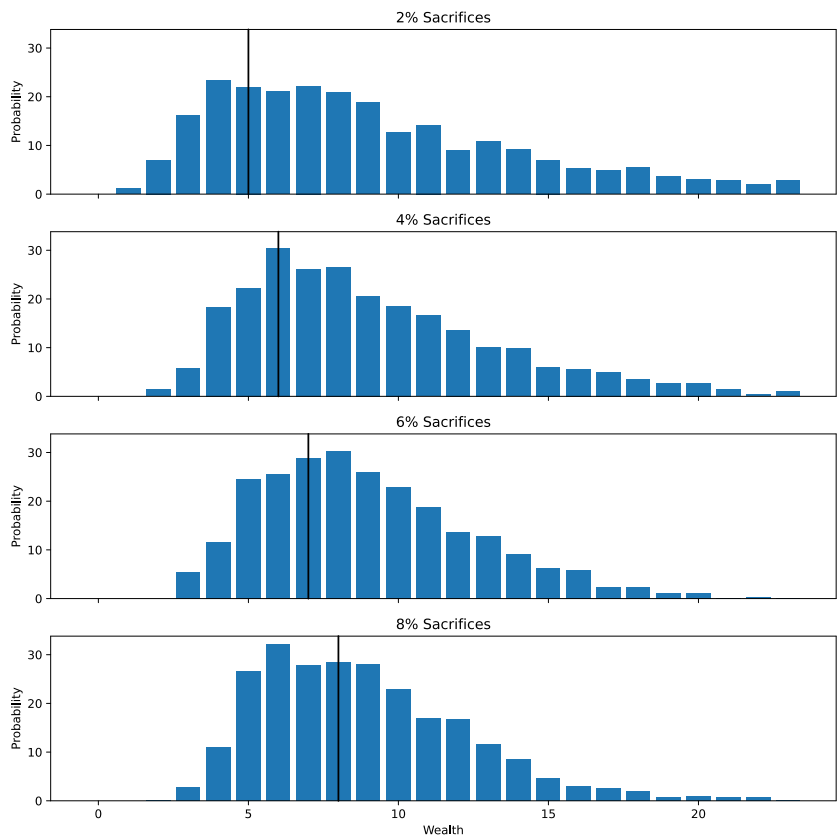
We can easily apply this model to the religious context if we consider in-group favoritism as a strong belief in the own group, because believers are inclined to believe that one's own group which can be recognized by a certain trait, marker or brand is superior to all other groups. Patriots become believers, traitors turn into heretics, cooperators are saints, and defectors are sinners.

The last fundamental agent-based model is related to sacrifices and wealth. Sacrifices can be considered as the progenitor and precursor of taxes. Each agent sacrifices a part of the own resources to enable the effective administration of the group.

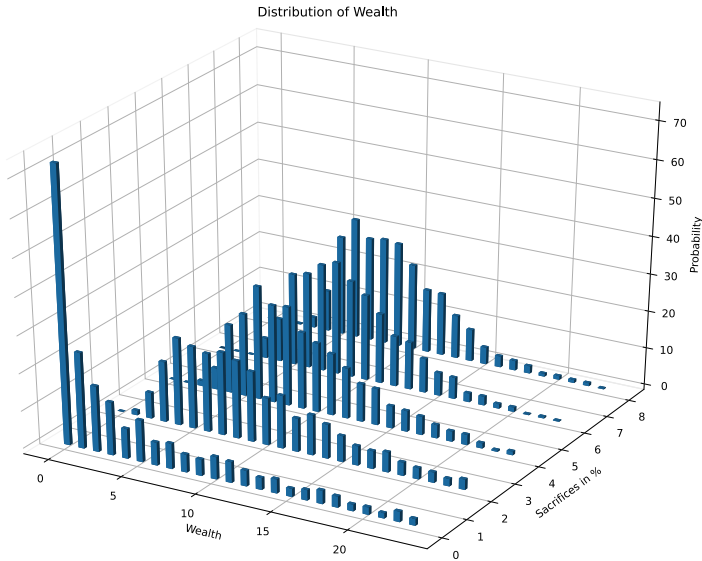
Our model is based on the “affine wealth model” from Bruce Boghosian (Boghosian, 2019) which has been described earlier by Brian Hayes as the “yard sale model” (Hayes, 2002). The simple “yard sale model” models economic transactions where agents lose or win a certain percentage of their wealth in random transactions which leads to high inequality because the rich agents get richer since wealth generates more wealth, similar to preferential attachment models. In the long run a few oligarchs among the agents hold practically all the wealth. The result is a Pareto distribution where most agents have nearly nothing and a few are very rich.



To counteract the inequality we can introduce a simple taxation, a flat tax rate where the result is redistributed among all agents. In every round a random agent is selected which is taxed at a certain tax rate, and the result is evenly distributed among all other agents. This models the flow of sacrifices or taxes from the group members to their leaders to finance the group activities, which include support and protection for members and reduces inequality. The higher the taxes are, the more the average wealth raises, and the lower the inequality if the taxes are redistributed evenly.



In 3D we can see how the distribution of wealth is changing from a Pareto distribution to a normal distribution if we increase the tax rate for the agents:



These five agent-based models demonstrate the basic functions of religious activities:

First we have considered an agent-based model of group formation in a “forgetful swarm” based on the classic swarm rules from Craig Reynolds which demonstrates that regular meetings are necessary to form a group and to counteract forgetfulness.

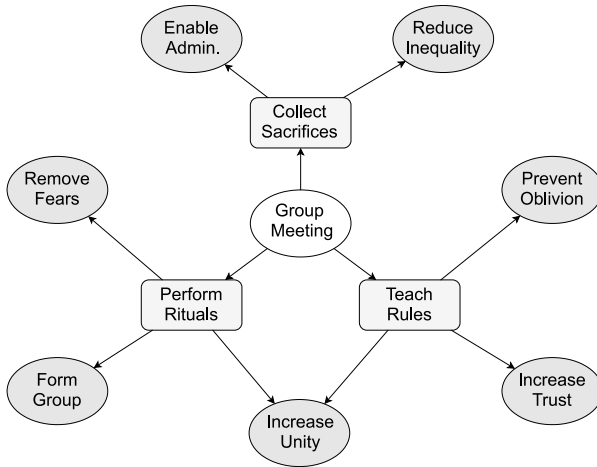
The second agent-based model of a “fearful swarm” was also an extended swarm model where the agents are anxious. It tries to model the effect of rituals in regular meetings which reduce fear.

Then we have examined a third agent-based model of “Trust & Deception” based on the cooperation models from Robert Axelrod. It demonstrates that prevention of theft, lies, fraud and retaliation is necessary to avoid trust loss, which can be achieved for example by interdictions of selfish behavior, teaching of prosocial rules and forgiveness.

We have examined a fourth agent-based model of “Belief & Heresy” based on the model for the “Evolution of Ethnocentrism” from Ross Hammond and Robert Axelrod, which we have applied to a new context. It demonstrates that the belief in the own ethnic, cultural or religious group can be a powerful strategy in an evolutionary model if it is associated with the support of the own group.

Finally we have looked at an agent-based model of sacrifices/taxes based the affine wealth model from Bruce M. Boghosian. It demonstrates that sacrifices/taxes are not only necessary to enable the administration of a group but also to reduce inequality which arises automatically because wealth generates more wealth.

The source code for all five models can be found in the Appendix. The agent-based models demonstrate the basic functions of religious group meetings and church services. The basic functions are: to collect sacrifices/taxes, to teach rules, and to perform rituals. The last two are the basic modes of religiosity that Harvey Whitehouse mentioned (Whitehouse, 2004). We can clearly see in the discussed agent-based models that regular group meetings enable the administration of the group, reduce inequality, prevent the oblivion of rules and eventually increase trust and unity.



These are just simple agent-based models which already offer basic insights into the dynamics of religious groups. The models show that religion no longer has to be uncharted territory for science if we consider it as a social phenomenon and as an evolutionary system. It is time to step into uncharted waters and to explore new worlds using agent-based models, as John Miller and Scott Page say at the end of their book (Miller, et al., 2007). We can create agent-based models for religious organizations just as we can describe the competition between political parties for followers by agent-based models (Laver, et al., 2011).

More complex models are possible, although it is certainly not easy to model human decisions in detail. In more complex agent-based models we can model attitudes, beliefs, desires and intentions, and measure the resulting actions and behaviors. It is possible to use BDI (Belief-Desire-Intention) architectures for agents, but creating an agent-based model for such a complex topic is certainly not easy. These models contain so many parameters and moving parts that it is an art to find a single special model that contains general insights.

The second way besides agent-based models is the use of social media analysis to measure the effects of propaganda in religious and political systems. Because the Internet gives us access to the way people think, it should be possible to measure people's sentiment in response to religious or political propaganda to a certain degree.

Modern tools of data science allow us to do a sentiment analysis of texts from social media platforms by using natural language processing (Igual, et al., 2017). We can use the same methods that are used to examine propaganda in political science and advertising in marketing. For example we can analyze sentiments and opinions in social media content to determine the perception of a brand, party or ideology before and after large-scale events such as national party conventions or church days (in Germany there are for instance national church days which are named "Kirchentage" that generate a lot of social media content). The sentiment should improve temporarily after these events.

THE MEANING OF LIFE

If the evolutionary view of life presented in this book is correct, what does it mean for the big questions like the meaning of life, life after death and other existential problems? In the evolutionary view of life we are part of multiple evolutionary systems. The meaning of life for us basically depends on what we decide it to be.

Let us recall what the humanistic philosophers have to say about it. Many philosophers, poets and scientists, among them Hermann Hesse, Albert Einstein and Joseph Campbell, have argued that life has no meaning in general, but we can give our own life a meaning. Erich Fromm calls it man's existential dichotomy. He says we are “being part of nature and yet transcending nature; being animal yet transcending animal nature” (Fromm, 1966).

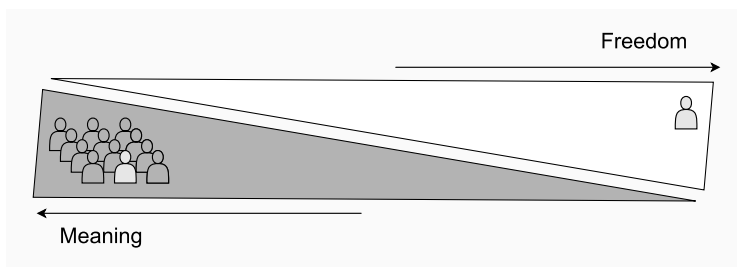
He mentions this existential dichotomy in most of his books. Fromm argues that animals are part of nature, but they are not aware of it and never transcend it, while humans are different. He says “self-awareness, reason, and imagination have disrupted the 'harmony' which characterizes animal existence. Their emergence has made man into an anomaly, into the freak of the universe. He is part of nature, subject to her physical laws and unable to change them, yet he transcends the rest of nature. He is set apart while being a part; he is homeless, yet chained to the home he shares with all creatures” (Fromm, 1955)

We have clearly a biological body, but also a personality and character. We are biological animals, but also more than animals. We desire immortality, but face certain death. The awareness of one's certain death is terrifying: “Cast into this world at an accidental place and time, he is forced out of it, again accidentally. Being aware of himself, he realizes his powerlessness and the limitations of his existence. He visualizes his own end: death” (Fromm, 1947).

Religious groups take away the fear of certain death. They promise immortality, but take away our freedom. They promise eternal life if we obey all the commandments and follow all the rules. For ideological or totalitarian groups it is similar. They promise immortality for total loyalty, even if this

immortality means just a yearly worship – if we consider for instance the fallen heroes that are remembered on certain holidays as the saints of the military.

In general we can say every group we join can give our life a new meaning, but also restricts our freedom. Freedom is the price we have to pay for meaning. The more we follow it unconditionally, the more it rewards us on the one hand, and confines our freedom on the other hand. Erich Fromm called this “Escape from freedom” (Fromm, 1941).



Religious and other ideological groups both offer this escape from freedom. The more freedom they have, the less there is something that gives their life a meaning. If you would be alone in the world, there would be nothing that really makes sense, but you would have total freedom. You could do anything, but nothing would have a meaning. Organizations like companies or the church restrict our lives, but they also create a new identity and a new role for us. This role can give our life a new meaning.

As a monk, for example, you renounce all worldly needs and totally submit to the community. You commit yourself to pray and work all day, which often includes reading or copying the Holy Books in order to replicate them. This means that you have almost no freedom and your life is totally regulated, but everything in life is given a new meaning. The organization promises that you will be redeemed and saved in the end. The more we allow social organisms or organizations to give our life a meaning, the less freedom we have.

If we want to be successful we have to decide which system we want to dedicate our lives, which genes we want to spread and which categorical imperative we want to follow. Do we want as much biological descendants as possible, as the biological imperative (mate and replicate yourself!) demands, or do we want to devote ourselves like a monk to the church, or do we want follow a career in the economy, in the media, in politics or in sports? We can choose which group and which genetic system we want to belong to primarily.

Unlike animals we can give our life a meaning that goes beyond the biological imperative of survival and reproduction, but only if we are able to figure it out. We have the freedom of choice. If we dedicate our life to one of these systems, it can give our life a purpose. If we do not make a selection, life can feel absurd and meaningless. Erich Fromm writes “Man is dependent; he remains subject to death, age, illness, and even if he were to control nature and to make it wholly serviceable to him, he and his earth remain tiny specks in the universe.” (Fromm, 1950)

Jean Paul Sartre says we are condemned to be free: “Man is condemned to be free; because once thrown into the world, he is responsible for everything he does.” (Sartre, 1956). Like Erich Fromm he argues that we are thrown into this world at an accidental place and time and have to find the meaning ourselves. The same freedom that allows us to give our life a meaning also allow us to take it away, of course, or to ruin the system altogether.

Paradoxically the same quality that makes us human, the connection of various evolutionary systems that allows us to be an individual connection of different systems, leads on a large scale of “empires”, “nations” and “races” to the worst disease in society, to all the collective * -isms that cause so many wars and conflicts. As we have seen the merging of different systems and genetic codes leads to evil diseases on the collective level, for instance the cultural tumors such as racism and nationalism, that arise if you believe that your own tribe, race or nation is the chosen one, and for some reason better than all others. What makes us human as individuals leads on a larger, collective scale to the worst diseases and * -isms of all kinds.

The belief in God is the oldest way of giving meaning to one's life that goes beyond the biological imperative of survival and reproduction. You can give your life a meaning by becoming part of a larger group, an organization, a community, but you also have to sacrifice a significant amount of your time and your freedom.

Today there are many other organizations, companies, political parties and social movements, from environmental organizations such as Greenpeace and Amnesty International to the classic football club. Most of these groups try to survive and reproduce themselves too. They all have found their own understanding of meaning which is related to the niche they occupy. For the car manufacturer the purpose is to produce cars. For Greenpeace and the Green Party the goal is to prevent pollution and to protect the environment. All of these organizations want to survive and to grow, on the one hand because they want to reach their goal, on the other hand because their members do not want to lose their jobs, their task and their purpose.

As humans we are in the middle of this marvelous zoo of organisms. We are for a short time on the stage and many genes behind the curtains want to use us as puppets and vehicles for their own purposes. They offer us dreams as motivation, and we offer them our life, our time and our freedom. As Shakespeare says "we are such stuff as dreams are made on, and our little life is rounded with a sleep".

On a more fundamental level, organisms created by genes have simply the purpose to replicate that genes. Genes are selfish (Dawkins, 1976), and this is the reason why life has existed for so long. The only things that survive in a world where entropy is increasing constantly and everything inevitably decays are objects that reproduce themselves repeatedly. Everything that is not constantly repaired, maintained and replicated gets lost in the course of time. The genetic code has replicated itself successfully for billions of years. It still exists because it has replicated itself. Selfish self-replication can be seen as the purpose of genes, and all other replicators as well, because that is what they do.

If selfish objects are considered as evil, then one can say that all animals are evil, all religious organizations are evil, and even life itself is evil, because they all selfish and stood the test of time for a long time (Vasily Grossman asks if life is evil in his novel "Life and Fate"). As humans we have the choice which evil we want to choose. We can choose a set of cultural genes and become part of their phenotype by joining their group. Nevertheless, there is still the problem of finiteness that threatens to strip all meaning from our activities.

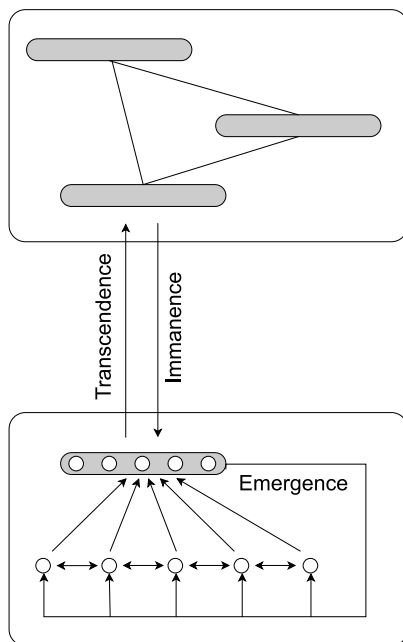
To sum it up, the meaning of life is derived from the genes that we choose. For biological genes this means to produce as much offspring as possible (the reason why it is either supper or pairing time whenever something is happening in nature is obviously that all animals follow the primary biological directives of eating and mating in order to survive and to reproduce themselves). For cultural genes this usually means to follow a movement or to join an organization which gives our life a meaning. The price for this meaning is our freedom.

Transcendence

Some religions promise resurrection, immortality and eternal life. What does this mean from the perspective of the evolutionary view of life? Richard Michod says “the emergence of new and higher levels of organization during evolution provides a compelling context for understanding the relations among certain fundamental properties of life, such as individuality, immortality and sex” (Michod, 1999).

By immortality, he means simply “the never-ending cycle of life”. In the evolutionary view of life the lifespan of organisms varies widely. Organisms can get very old, but they are rarely immortal. An individual can obtain a longer life if it manages to attach itself to a larger long-lived group, for example by being the founder or a maintainer of a religious group, order or a similar ideological organization. In this case character traits of the individual are preserved by the group which can outlast him by far. The personality of an individual can transcend his normal life simply by crossing the border to a different system. This is known as **transcendence**: an experience that goes past normal limits, or the ability to achieve this, a crossing of system boundaries.

In the opposite direction **immanence** can be defined as the divine that is present in the material world. As we have argued in earlier chapters, the divine and holy things are always related to a group or community. A group which emerges in one system can be the embodiment of an entity in another system. In this way an entity which is



not part of the system can be present in a system as a natural and permanent part of something.

If we look back to the “Mind and Body” chapter, and apply these terms to it, we can say the emergence of consciousness is possible by the transcendence of the “Ego” and the immanence of the “Me”, in the words of Sartre (Sartre, 1957).

Nevertheless if we consider transcendence as the secret to a kind of eternal life, then the best way to spend your life is to sacrifice it for something that lasts longer than it. Those who sacrifice themselves for a group, community or organization can expect to receive something back. The biggest sacrifice someone can make is to offer the own life. Someone who sacrifices his own life for an organization can hope to get something back, even if it is just the remembrance as a hero, saint or martyr. As William James said in the year 1900 “The great use of a life is to spend it for something that outlasts it.” (Perry, 1935).

The ancient Romans and ancient Greeks formulated it more poetically. They believed that love makes the soul immortal. The story of Cupid (in the case of the Romans) or Eros (in the case of the Greeks) and Psyche says that love can make immortal. Because of the love for Cupid, Zeus ultimately gives Psyche eventually immortality (Gagarin, 2010).

One is tempted to think that organizations promise the dream of eternal life because they want to obtain eternal life themselves. In fact only the founders and prophets and organizations as a whole last longer than all individual members. For the teachers and priests it becomes much harder, and for ordinary members it is nearly impossible, simply because they are too many and nobody remembers them.

The older an organization, company, party, nation or church gets, the more difficult it will be to find a place in paradise, i.e. to obtain a place in the overcrowded pantheon of saints and to gain access to the small inner circle of

those who have achieved something special. This is the circle of founders, prophets and other saints that have sacrificed their life for the group. Once there are 10,000 saints and more in an organization, one more will no longer attract attention, and it gets increasingly difficult to find a place in this overcrowded heaven. The early bird catches the worm here too.

The price for those who make it in the pantheon of saints is immutability. They are no longer able to change themselves if they have obtained “eternal life”. Immaterial things and abstract ideas are indestructible, and therefore immortal, but they are also immutable. Just as lack of freedom is the price for meaning, immutability can be considered the price of immortality. Plotinus and Plato knew that “time is the moving image of eternity”.

Creativity can counteract the destructiveness of death. Genes constantly create their organisms. Using recipes, blueprints and construction manuals we can create something too. Creativity is the force that allows us to create something. Things can be resurrected in principle by reviving them in movies or, in the future, in virtual worlds. The Titanic for example has been revived by movies. For persons this is only possible if someone records during the lifetime on the one hand the external appearance and look, and on the other hand the internal character and personality, for example by painting a portrait, taking a photo or writing a biography of the person in question.

The urge to do that is especially strong for tragic things like the Titanic which sunk in a monumental disaster although it was considered as huge and unsinkable, or people who died tragically, although they have been really good persons or have sacrificed their life for someone or something. The large discrepancy between a good character and a tragic fate can be an incentive to revive the person or vehicle. In these cases affectionate reconstruction can be the secret of resurrection.

Reconstruction is of course only possible if we have enough information. For example we cannot revive the pharaohs that build the pyramids correctly because we neither know how they looked nor what they thought. So if you

want to preserve something, make a good photo, write a comprehensive book, shoot an impressive movie. There is no chance to reconstruct or to resurrect something if there are no records and no information about it. The more information we have, the better.

Paradoxically the lightest form of entertainment, the show business of Hollywood, has solved the hardest problems of philosophy. It's amazing how the American show industry has solved both the biggest problem of philosophy (the hard problem of subjective consciousness by showing what it's like to be someone else) and the hardest problem of religion (the problem of resurrection by restoring the past and showing people the way they were then). Hollywood movies allow us to achieve exactly what the ancient religions have promised: resurrection and eternal life. Every time a movie is played and watched, the persons from the past become alive in their actors. They are revived.

In this respect, Hollywood has already answered all the big questions: can we become immortal and is there an eternal life, can we travel through time, into the distant future and into the past, and what is consciousness, what makes people individual and how can we make subjective inner feelings comprehensible and understandable. It is fascinating. For centuries, philosophers have struggled to find the answer to the puzzle, and Hollywood finds it along the way in search of profit and pleasure.

SUMMARY

CONCLUSION

In this book we have tried to take a look at a new explanatory approach for two major aspects of human civilization: the big world religions and the phenomenon of fascism in all its forms and types. We have examined fundamental connections that have remained in the dark for thousands of years.

Let us summarize what the hidden genes are, and where they are hidden. The secret has remained unseen for so long and was not even recognized by Darwin and Dawkins, although they were close to discovering it. The strange thing is that the biggest secrets often hide behind the most well-known objects like language, communication and books.

The secret hides in the holy books which we all know, in the holy books that have astonishing effects if they are read regularly in church services. To find this secret we just need to connect the dots from different scientific disciplines:

Anthropology tells us that religion came into being with humanity and language. Religion and faith are a byproduct of human evolution, and they are of central importance for us (Atran, 2002). Both humans and language are necessary ingredients for religions.

History tells us that religions have a long history and changed frequently during the course of time (Armstrong, 1993). We know that single religions have split into different branches and merged again, in other words that religion was subject to evolution.

Sociology tells us that the group is essential for all religious questions. Religion is a social phenomenon (Collins, 1992). Nothing in religion makes sense except in the light of sociology, where we can consider it as a natural phenomenon.

Biology tells us that the secret of life is the genetic code. We know how important genes are and how they are expressed. Evolution is the fundamental

principle and most important force (Stearns, et al., 2005). Richard Dawkins explained us how selfish genes work, and David Sloan Wilson has shown that religious groups as adaptive units are indeed subject to evolution too (Wilson, 2003).

Psychology tells us that religion is a subjective phenomenon that is based on religious experience and passion. Humans are controlled by emotions as well as learned behavioral code. In addition we know from psychology that the most creative theories bridge distinct realms of ideas and result from the interdisciplinary intersection of multiple fields, as Mihaly Csikszentmihalyi confirmed (Csikszentmihalyi, 1996).

Philosophy tells us that to discover a new paradigm, we need the willingness to try anything and the courage for “extraordinary research”, as Thomas Kuhn has called it (Kuhn, 1962). For example we need to consider something unnatural as a natural phenomenon (Dennett, 2006).

And if we sum up these simple insights from different disciplines, and combine the different threads, we come indeed to an amazing conclusion. Religion is clearly about the group that is subject to evolution. It is a social phenomenon. Nothing in religion makes sense except in the light of sociology. And we have evidence that religious groups are based on “hidden genes”:

- Anthropology tells us the origin and the ingredients (human evolution)
- Biology gives us hints what to look for (genes and evolution)
- Religion itself teaches us the genotype (the rules and commandments)
- History teaches us the phylogenetic tree (the evolution of the branches)
- Sociology explains the phenotype (the religious group)
- Psychology helps to explain how propaganda works (the gene expression)

We even know the way how the genes are expressed: by speeches and sermons in regular church services and whenever someone teaches us to do something. Our knowledge of psychology and marketing helps us to understand the process. What we don't know exactly is how the genes are building the

phenotype in every detail. It is incredibly complex, because it can be a long way from the things we hear and learn to the things we say and do. To be fair we don't know this for biological genes either. And yet the process is amazingly simple at the same time since we know the phenotype and the genotype quite well.

Just as all biological organisms are based on biological genes, almost all big religious organizations and ideological groups are based on cultural genes which are passed from generation to generation. This cultural genetic code controls the creation of collective social organisms. Humans and language are necessary ingredients for the emergence of religion, because it uses language to form collective entities out of isolated individuals.

Religious books that have been passed on for thousands of years do not behave fundamentally different than biological genes that are passed on from generation to generation. They create their own survival vehicles to lever themselves into the next generation. Just as biological genes create biological organisms to replicate themselves, cultural genes create cultural organisms to replicate themselves. Both types of genes tussle with each other for the control of their vehicles.

What is different is that cultural evolution of religious groups is happening on a different time scale than biological evolution. Religion is a social phenomenon that appeared at the beginning of civilization and still exists today. Some religious groups are thousands of years old: the Catholic Church we all know so well is a 2000 year old lifeform. The Orthodox Church is a 1000 year lifeform. Compared to biological organisms they are alien lifeforms, but they are alive, because they replicate and maintain themselves.

Religious organisms maintain themselves by expressing the genes of their holy books, which contain the history of the religious group and their founders, the central rules and commandments which form a group and hold it together. Holy scripts are not directly blueprints, but they are responsible for the creation of coherent groups. They are more like cookbooks which contain a number of

distributed recipes for behavioral patterns in specific situations that can be used to construct a social community. The genes are hidden in a large number of non-coding text parts, just like in biological systems.

The core elements of a holy book or sacred script are the fundamental laws, the basic commandments and central rules. The commandments of a religion are the cultural genes which contain creative rules and guidelines for the construction of a religious community that forms a coherent group. The 10 commandments of the Bible correspond indeed to the 10 basic genes of the Jewish and Christian religion.

Genes are only effective if they are expressed. This happens by a speech or a sermon in front of a group. A sermon in a church service is a gene expression. It is the exact equivalent to the expression of DNA in a biological cell. The expression of genes is a fuzzy process which increases the probability of a target group or cell to act in a certain way. It is most effective if it is repeated regularly at the same time and the same place.

Using this evolutionary view of life well-known objects like speeches, communication, language and books acquire a new function: books can contain genes, language can be used to form mRNA, and communication in form of speeches can be a gene expression.

The true secret of the church are indeed the genes hidden in the commandments and interdictions of the holy books that are expressed during church services. The generated organism is simply the community of all members held together by the rituals and shared beliefs.

These living organisms react especially hostile and fierce if the own integrity is threatened by foreign gene material. Book burning and censorship can be seen as a reaction of an immune system from a totalitarian system to dangerous gene material, where the foreign genes are destroyed. The most inhuman events in history – the Spanish inquisition in the middle ages, the crucifixions in ancient Roman times, the human sacrifices in the Aztec empire, the holocaust in Nazi

Germany – can be seen as a hostile reaction of a social organism which felt that the own existence was severely threatened.

Churches and other ideological organisms are like us organisms generated by genes, they only have a much longer lifespan. Societies which consist of these organisms can get cancer and this is quite common. We have tried to analyze some of these tumors, which will most likely occur in the future too. Fascism has always been a part of human civilization, because it is a disease of human society and collective organisms in general.

Church buildings, temples and cathedrals themselves are only a solid shell of stone that remains as impressive fossil long after the religious community has stopped to exist, since religions appear and disappear like other living organisms. These living organisms, even if they seem alien to us, leave us temples and cathedrals as the fossil witness of their own existence and former greatness.

This means everything we know in the context of a synagogue or church has a deeper, hidden meaning: the priest and the rabbi, the sermon, the prophet and the reformer, the holy books and scriptures, the holy days, the congregation and the church building. They are all names to describe properties of a life-form on a collective level that evolves on a time-scale which dwarfs our own short life. There is grandeur in this view of life, as Charles Darwin would say.

APPENDIX

CULTURAL GENES & PERICOPES

This appendix contains a list of all cultural genes from the New Testament. The text parts are named pericopes. They are parts that are actually read on Sundays during the year (Source: various church websites including www.daskirchenjahr.de and www.berlinerdom.de). All of these pericopes contain concrete rules, obligations, instructions or laws that people have to obey.

They include the 2 laws of the Great Commandment (the duplicated 1st commandment of the Old Testament and the law to love your neighbor), the 4 or 5 laws from the Sermon on the Plain and the Sermon of the Mount (the law to “love your enemies”, the Golden Rule, the law to prohibit judgement, the law to stop following false prophets), and the 2 missionary commandments in Matthew and Mark to evangelize all the world and to preach the gospel to all nations. They do not include the Christmas story which can be considered as a rule to “practice hospitality” or the general promises of eternal life.

Matthew: 28 chapters

Matthew 4, 1-11 ("Worship God, and serve him only")
Matthew 5, 38-48 ("Do not resist an evil person", "Give to the one who asks you", "Love your enemies")
Matthew 6, 5-15 ("Forgive others")
Matthew 6, 16-21 ("Do not store up treasures on earth, but in heaven")
Matthew 7, 12-20 (Golden Rule, "Do to others as you would have them do to you")
Matthew 7, 24-27 ("Hear the rules, and apply them")
Matthew 10, 34-39 ("Follow me unconditionally")
Matthew 14, 22-33 ("Have faith")
Matthew 18, 21-35 ("Forgive each other")
Matthew 21, 28-32 ("What you do matters, not what you say")
Matthew 23, 1-12 ("Be humble and self-critical", duplicate of Luke 18, 9-14)
Matthew 25, 31-46 ("Help your neighbor")
Matthew 28, 16-20 (Missionary gene, "Go and make disciples of all nations")

Mark: 16 chapters

Mark 8, 31-38 ("Deny yourself and follow me")
Mark 10, 17-27 ("Give your money to the poor", "Follow me unconditionally")

Mark 10, 35-45 ("Be a servant if you want to become great")
Mark 12, 28-34 (Greatest Commandment, "Love God" & "Love your neighbor as yourself")
Mark 16, 9-20 (Missionary gene, "Go into all the world and preach the gospel")

Luke: 24 chapters

Luke 1, 67-79 ("Praise the Lord because he redeems us")
Luke 3, 1-20 ("Share your wealth", "Do not extort money",
"Do not accuse people falsely")
Luke 6, 27-38 ("Give to the one who asks you", "Love your enemies", "do good to those who hate you",
"Be merciful")
Luke 6, 37-42 ("Do not judge", "Do not condemn")
Luke 9, 57-62 ("Follow me unconditionally")
Luke 10, 25-37 (Greatest Commandment, "Love God" & "Love your neighbor as yourself")
Luke 18, 9-14 ("Be humble and self-critical", duplicate of Matthew 23, 1-12)
Luke 22, 39-46 ("Pray that you will not fall into temptation")

John: 21 chapters

John 6, 30-35 ("Have faith", "Believe in me")
John 13, 34-35 ("Love one another")
John 15, 1-8 ("Remain in the community")
John 15, 9-17 ("Love each other" 2x)
John 20, 24-29 ("Have faith" - "blessed are those who have not seen and yet have believed")

Acts: 28 chapters

Acts 1:8 Mission (Missionary gene)
Acts 13:47 Mission (Missionary gene)

Romans: 16 chapters

Romans 2, 1-11 ("Do not judge")
Romans 12, 1-8 ("Offer your body as sacrifice", "Be humble and serve")
Romans 12, 9-16 ("Hate what is evil; cling to what is good", "Practice hospitality",
"Live in harmony with one another", "Do not be proud")
Romans 12, 17-21 ("Do not repay anyone evil for evil", "Live at peace with everyone", "Do not take revenge")
Romans 13, 8-12 ("Love your neighbor as yourself")
Romans 14, 7-13 ("Do not judge")
Romans 14, 17-19 ("Be peaceful")
Romans 15, 4-13 ("Accept one another")

1. Corinthians: 16 chapters

1. Corinthians 4, 1-5 ("Do not judge")
1. Corinthians 6, 19-20 ("Flee from sexual immorality")

- 1. Corinthians 13, 1-13 ("Love!", "Be patient", "Be kind", "Trust!", "Hope!")
- 1. Corinthians 14, 1 ("Follow the way of love")

2. Corinthians: 13 chapters

- 2. Corinthians 13, 11-13 ("Live in peace")

Galatians: 6 chapters

- Galatians 5, 25-26 ("Do not provoke or envy each other")
- Galatians 6, 1-10 ("Carry each other's burdens", "Do good to all people")

Ephesians: 6 chapters

- Ephesians 4, 22-32 ("Do not lie", "Do not steal", "Get rid of all bitterness, rage and anger, brawling and slander", "Be kind and compassionate to one another", "Forgive each other")
- Ephesians 5, 1-9 ("Walk in the way of love", "Avoid immorality, greed, obscenity", "Strive for goodness, righteousness and truth")
- Ephesians 5, 15-20 ("Do not be foolish", "Do not get drunk on wine")
- Ephesians 6, 18-20 ("Pray on all occasions")

Philippians 4 chapters

- Philippians 2, 1-4 ("Do nothing out of selfish ambition or vain conceit", "Value others above yourselves")

Colossians: 4 chapters

- Colossians 3, 1-4 ("Set your minds on things above, not on earthly things")
- Colossians 3, 12-17 ("Bear with each other and forgive one another")

1. Thessalonians: 5 chapters

- 1. Thessalonians 5, 14-15 ("Encourage the disheartened", "Help the weak", "Be patient", "Strive to do what is good for each other")
- 1. Thessalonians 5, 16-22 ("Pray continually", "Reject every kind of evil")

Hebrews: 13 chapters

Hebrews 10, 23-25 ("Spur one another on toward love and good deeds", "Meet together",
"Encourage one another")

Hebrews 11, 1-2 ("Have faith")

Hebrews 12, 1-3 ("Throw off the sin", "Concentrate on Jesus")

Hebrews 13, 1-3 ("Keep on loving one another", "Practice hospitality")

James 5 chapters

James 1, 12-18 ("Resist desire that leads to sin")

James 5, 7-11 ("Be patient")

James 5, 13-16 ("Pray if you are in trouble", "Call others for help if anyone is sick",
"Confess your sins to each other")

1. Peter: 5 chapters

1. Peter 2, 1 ("Rid yourselves of all malice and all deceit, hypocrisy, envy, and slander")

1. Peter 2, 21-25 ("You should follow in his steps because Jesus has suffered for you", "Do not retaliate")

1. Peter 3, 8-17 ("Love one another", "Be compassionate and humble",
"Do not repay evil with evil", "Do good", "Seek peace")

1. Peter 4, 7-11 ("Love each other deeply", "Practice hospitality")

1. Peter 5, 5-11 ("Be humble and self-critical", "Resist evil")

2. Peter: 3 chapters

2. Peter 1, 2-11 ("Strive for faith, goodness, self-control, perseverance, godliness, mutual affection and love")

1. John: 5 chapters

1. John 4, 7-12 ("Love one another" 3x, "We ought to love one another")

1. John 4, 16-21 ("Love your brothers and sisters")

AGENT-BASED MODELS SOURCE

This appendix section contains links to the source code of all agent-based models in Javascript and Python

Agent Based Model for “Forgetful Swarm” and “Fearful Swarm” in Javascript

<https://github.com/JochenFromm/SwarmIntelligence>

Evaluation of experimental results for “Forgetful Swarm” in Python

[./blob/master/notebooks/ForgetfulSwarm.ipynb](#)

Evaluation of experimental results for “Fearful Swarm” in Python

[./blob/master/notebooks/FearfulSwarm.ipynb](#)

Agent-Based Model “Trust & Deception” in Python

[./blob/master/notebooks/Trust.ipynb](#)

Agent-Based Model “Belief & Heresy” in Python

[./blob/master/notebooks/Believers.ipynb](#)

Agent-Based Model “Wealth & Sacrifices” in Python

[./blob/master/notebooks/Wealth.ipynb](#)

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INDEX

- Agent-based model 100, 207, 208, 210, 211
- Anthropology
 - Evolution 41, 47, 232
- Archaeology 14
- Authoritarianism
 - and catholic church 158
 - and family stem cell 187
 - and ruling family 186
 - prevention of 199
- Aztecs
 - human sacrifices 150
 - writing system 150
- Bible
 - and archaeology 14
 - and celibacy 127
 - and history 34
 - as blueprint 32
 - as story of defeat 77
 - book as chromosome 56
 - Cain and Abel 40
 - Christmas 73
 - Easter 74
 - Eden 40
 - Jesus 147
- Biology
 - DNA 47, 55
 - Endoplasmic reticulum 75
 - Evolution 36
 - Secret of Life 232
- Brain washing 115
- Buddhism 206
- Bureaucracy 111, 112, 114
- Censorship
 - and destruction of genes 235
 - and gene expression 80
- China
 - ancient China 149
 - Red Book 57
 - re-education camps 120
 - Terracotta Army 150
 - Totalitarianism 197
 - writing system 150
- Christianity
 - and the Roman Empire 142, 144
 - early forms 19, 32, 146
 - genes 62
 - Pericopes 62, 74
 - prophets 141
 - Religious holidays 73
 - Size 205
 - Ten commandments 52
- Civilization
 - and barbarism 149, 150, 157
 - oldest forms of 41
 - origin of 40
- Cultural tumor
 - aggressiveness 169
 - merging of systems 167, 170
 - tumor markers 161
- Culture
 - writing systems 34, 40, 41
- DNA
 - and genetic code 54
 - Chromatin 90
 - discovery 47
 - methylation 163
 - non-coding 89, 91, 92
- Economy
 - Slavery 44
- Evil
 - banality of 25
 - definition 24

- Evolution
 - and biology 15
 - and religion 47
 - in social systems 50, 105, 167
 - Phenotype 55, 87
 - Pleiotropy 87
 - running backwards 168
- Fascism
 - and terrorism 193
 - as cancer of society 172
 - as cultural tumor 158, 163
 - as throwback 166, 168
 - Atenism 161
 - Authoritarianism 197
 - Bonapartism 159, 161, 171
 - Christianism 161
 - Communism 162
 - definition 159, 162, 171
 - Imperialism 160, 161
 - in Italy 158, 162
 - Islamism 161
 - Militarism 159
 - Mobilizing passions 77, 117
 - Nazism 158, 162
 - prevention of 196, 199
 - propaganda patterns 163
 - Racism 162
 - stages 172
 - Stalinism 158
 - Theories 171
 - Totalitarianism 197
- Gene expression
 - and epigenetics 90, 163
 - and propaganda 66, 116
 - Behavior patterns 82, 83
 - Gene transcription 66
 - Gene translation 75, 79
 - Ribosomes 75
- Genes
 - Christian religion 62
 - Conflicts between multiple 125
 - Cultural genes 52, 53, 54, 56, 102, 126
 - definition 54
 - Jewish religion 61
 - Missionary gene 60, 204
 - Selfish genes 124
 - Transcription factors 72, 74
- Hinduism 205
- History
 - and religion 47
 - Religion 232
- Immanence 228
- Imperialism
 - in ancient Rome 158, 160
- Judaism
 - Ark of the Covenant 45
 - Genes 61
 - Maimonides 32
 - Religious holidays 73
 - Sabbath 73
 - Size 205
 - Ten commandments 52
- Life
 - is evil 110, 227
 - meaning of 223, 225
 - secret of 47
- Marketing 79, 83, 115
- Nazism
 - as cultural tumor 177
 - as totalitarianism 177
 - Holocaust 150
 - prevention of 196
 - synchronization 167
- Philosophy
 - age 47, 48
 - interdisciplinary insights 233
 - mind and body 129, 131

- supervenience 11
- The hard problem 231
- Political parties
 - and evolution 141
 - definition 140
- Propaganda
 - acceptance of 122
 - and avertising 123
 - and brain washing 115, 118
 - and censorship 80
 - and manipulation 116
 - and persuasion 89
 - and PR 197
 - and worldview 117
- Psychology 77
 - age 48
 - Religion 233
- Religion
 - Age 13
 - and civilization 7
 - and evolution 138, 139
 - and science 9
 - as natural phenomenon 15
 - blessing 38
 - Church 9, 10, 12, 103
 - curse 38
 - definition 9
 - Devil 25
 - good vs evil 21, 25
 - heaven 33, 38
 - hell 33, 38
 - holy vs profane 17
 - metaphors 32
 - praying 28
 - rituals 31, 210
 - sacrifices 44, 46
 - saints 37, 224
 - senescence 113
 - similarities 10
 - social phenomenon 26, 28
 - Sociology 36
 - Temples 43, 46
- Sociology
 - age 47, 48
 - norms 48
 - Religion 232
 - social facts 102
- Soul 23, 25, 124, 133
- Species 143, 148
- Swarm intelligence
 - Boids 98, 207
 - collective organisms 103, 105
 - principles 97, 98, 147
 - synchronization 31
- Time travel 29, 34
- Totalitarianism 185, 188, 190, 193
 - and religious stem cell 187
 - as cultural tumor 177
 - prevention of 199
- transcendence 131
- Transcendence 228, 229
- Tumor
 - definition 162
 - origin 174
 - prevention of 196
 - stages 171, 172

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