r0oT

a network to achieve global coordination
and true civilization. (Manifestum v2.3)

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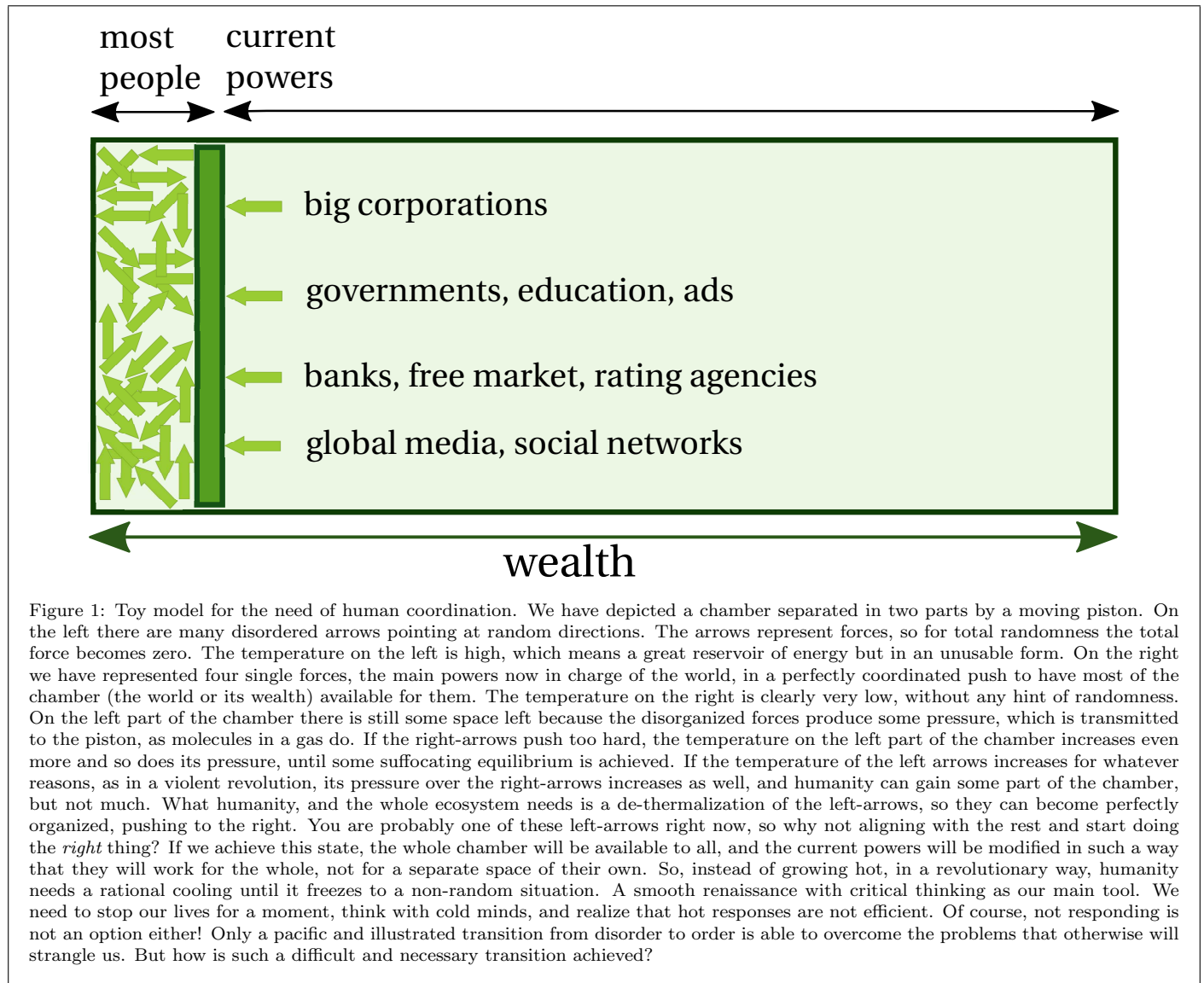
Time has arrived for civil society to start *real* global changes. Governments, banks, global media, big corporations... are just trying to maintain their current and unsustainable status quo in which a ridiculous minority [2] benefits from having the rest of the natural and human world under *inadmissible* conditions [3, 4]. We cannot trust them anymore. We need to *take over*. The ominous prospect of the climate crisis urges us to start acting now. This is *no utopia*. It is an imperative and urgent need. The whole ecosystem in general and humanity in particular need a wise plan, a smooth renaissance to peacefully build a sustainable, fair and life-friendly future [5]. This text introduces r0oT, a nonprofit global network conceived to allow people to be strongly coordinated. A coordinated society, properly informed, will start acting, for once, in its own favor, for its own survival. This necessarily implies acting as well in favor of our natural environment, to which we belong and on which we all *depend*. If you really care about the world you live in, about yourself and your family in the long term, about human civilization, about our fellow creatures living on Earth... just read this, study it and join. You are *indispensable*. Give it a chance. It could be the last.

1 brief description

This is a proposal of action aimed to everyone concerned by climate crisis and other world scale problems. The idea is to build a non-profit, P2P and anonymous network with a tree-like structure in which everyone can be integrated in just 13 layers of branching. Only through a high degree of coordination can humanity overcome the crisis that we all need to face. r0oT is essentially a network in which every person joining becomes a node interacting with its closest node-neighbors. Nodes are grouped in small cells that we call stations, which communicate by simple encrypted emails or other secure messaging protocols. By periodic voting, members can also swap positions in the network so no one remains at the same place for long. The whole point is that information (= information + action) can appear anywhere and then propagate through the system by using reports. A given report, our unit of informaction, will arrive to a station, where members will have a given time to perform the proposed actions and to study, discuss, contrast and process its contents before forwarding a new report version to next neighbor stations. *Encrypted reports flowing through a decentralized and serverless network of anonymous nodes that are randomly mixed through the whole world are very difficult to track and control by governments or other entities that can be against them, so everyone can have access to free information, and with such information we, people, get the power, and true democracy can be finally accomplished.* Only a single, global democracy with global laws can be truly democratic. To work in this direction, inner layers, with representatives from all places on Earth, will deal with universal topics such as human rights and human obligations towards the ecosystem and the whole humanity, and with general principles that can provide a world-wide equality. More external layers will deal with increasingly practical and specific issues, so at the most external layers r0oT can act as a local network of physically close neighbors. The system allows issues arising at a given location to be echoed to the whole network until, if required, global responses are made to fix them, but at the same time global issues like climate crisis can be divulged and be present at each home. *What is local can acquire a global reach and what is global can reach every location.* Right now humanity is insanely working against its own ecosystem, Gaia, and against itself, because of our incoordination and because of the ill and manipulated information that we receive from almost everywhere. If we manage to connect all people with this fractal-like structure, we can all learn what is really happening and find actions to perform. If a government or a big company makes something that is bad for Gaia or humanity, and we happen to be all aware of it, a coordinated response by people will force them to rectify. Most governments will not move a finger for global issues because they depend on private interests. By acting together we can awake and unfold the greatest transforming force on Earth and use it to look after Gaia and us, who are just part of her. In the text we also discuss important topics as immunity (how the network protects itself from becoming corrupt), and specialists networks, where uncorrupted and necessary technical knowledge can also flow and percolate through society. In brief, r0oT is a structure in which humanity can have access to free information and learn from it. Consequently, by developing an increasingly stronger critical thinking, we can become

free of the current manipulative powers now in charge. This may be the only escape from environmental and human disaster.

2 coordination

Figure 1: Toy model for the need of human coordination. We have depicted a chamber separated in two parts by a moving piston. On the left there are many disordered arrows pointing at random directions. The arrows represent forces, so for total randomness the total force becomes zero. The temperature on the left is high, which means a great reservoir of energy but in an unusable form. On the right we have represented four single forces, the main powers now in charge of the world, in a perfectly coordinated push to have most of the chamber (the world or its wealth) available for them. The temperature on the right is clearly very low, without any hint of randomness. On the left part of the chamber there is still some space left because the disorganized forces produce some pressure, which is transmitted to the piston, as molecules in a gas do. If the right-arrows push too hard, the temperature on the left part of the chamber increases even more and so does its pressure, until some suffocating equilibrium is achieved. If the temperature of the left arrows increases for whatever reasons, as in a violent revolution, its pressure over the right-arrows increases as well, and humanity can gain some part of the chamber, but not much. What humanity, and the whole ecosystem needs is a de-thermalization of the left-arrows, so they can become perfectly organized, pushing to the right. You are probably one of these left-arrows right now, so why not aligning with the rest and start doing the *right* thing? If we achieve this state, the whole chamber will be available to all, and the current powers will be modified in such a way that they will work for the whole, not for a separate space of their own. So, instead of growing hot, in a revolutionary way, humanity needs a rational cooling until it freezes to a non-random situation. A smooth renaissance with critical thinking as our main tool. We need to stop our lives for a moment, think with cold minds, and realize that hot responses are not efficient. Of course, not responding is not an option either! Only a pacific and illustrated transition from disorder to order is able to overcome the problems that otherwise will strangle us. But how is such a difficult and necessary transition achieved?

This is not the place to analyze how the ecosystem is being heavily injured by humans [6], or how too many of us and other species are in deplorable conditions. There are already some good documentaries that show the current state of the art [7, 8, 9, 10] and there is no point in doing the same here. First of all, go and watch them and many others. They are excellent in showing what is happening or what may happen, but they don't usually address the crucial issue of what can we do to prevent it and how. Of what to do when, shocked and convinced that something must be done, we watch their end credits without knowing how to start, where to begin. Confused by the fact that even many NGO's are silent about key issues as, for example, the need of a global change of diet. Stunned by a large amount of disorganized information. Well, these problems are over. The project introduced in this text is the necessary corollary to those other references, the place to go after you become angry by learning how bad we are behaving and how ominous is our immediate future. Long story short: we don't trust that governments will seriously follow the Paris Agreement [11, 12] or will take different courses of action in those issues that are really important, in a broad sense. They are too bound to their particular interests to worry about Gaia or humanity in general. And we cannot wait for good politicians to appear from nowhere. There are too many problems and too important that need to be faced right now. This has to be done by the civil society, by people, by you and us. If not, who else will? Yes, you have guessed it: we need to override governments and every

other layer of power that will oppose to change. And yes, without anarchy of any kind. We are more clever than that. Anarchy, communism, capitalism… They are all *obsolete.* Current economy is to ecology what astrology is to astronomy: old pseudosciences that just tell you what you want to listen, while taking your money afterwards. What you will find here is not a theoretical analysis of capitalism or a discussion about the environment: instead, this is the place to find a *practical proposal of action* that targets the global problems you should already know. It is common to hear today: 'what can I do alone?' and the true answer is that, alone, we can't do anything, at least not in a constructive way. We are currently in an over populated world where the degree of coordination between humans is extremely low, probably null, so small, heroic efforts contribute almost nothing to the global average. Our combined force equals to zero, or a very small quantity compared with the well coordinated actions of the powers now in charge. A disorganized humanity clearly benefits these powers, so they will work hard against any attempt of a global coordination in order maintain their status quo. They know that no one can stand a single chance against a coordinated humanity. Our latent, hidden collective force is too great to encounter the slightest opposition. The challenge is, then, to achieve such a coordinated state. This is the main goal of r0oT: to provide humanity with a structure, a skeleton to our muscle, an order to our anger. That will allow to start acting globally to our own real, broad and long term interest.
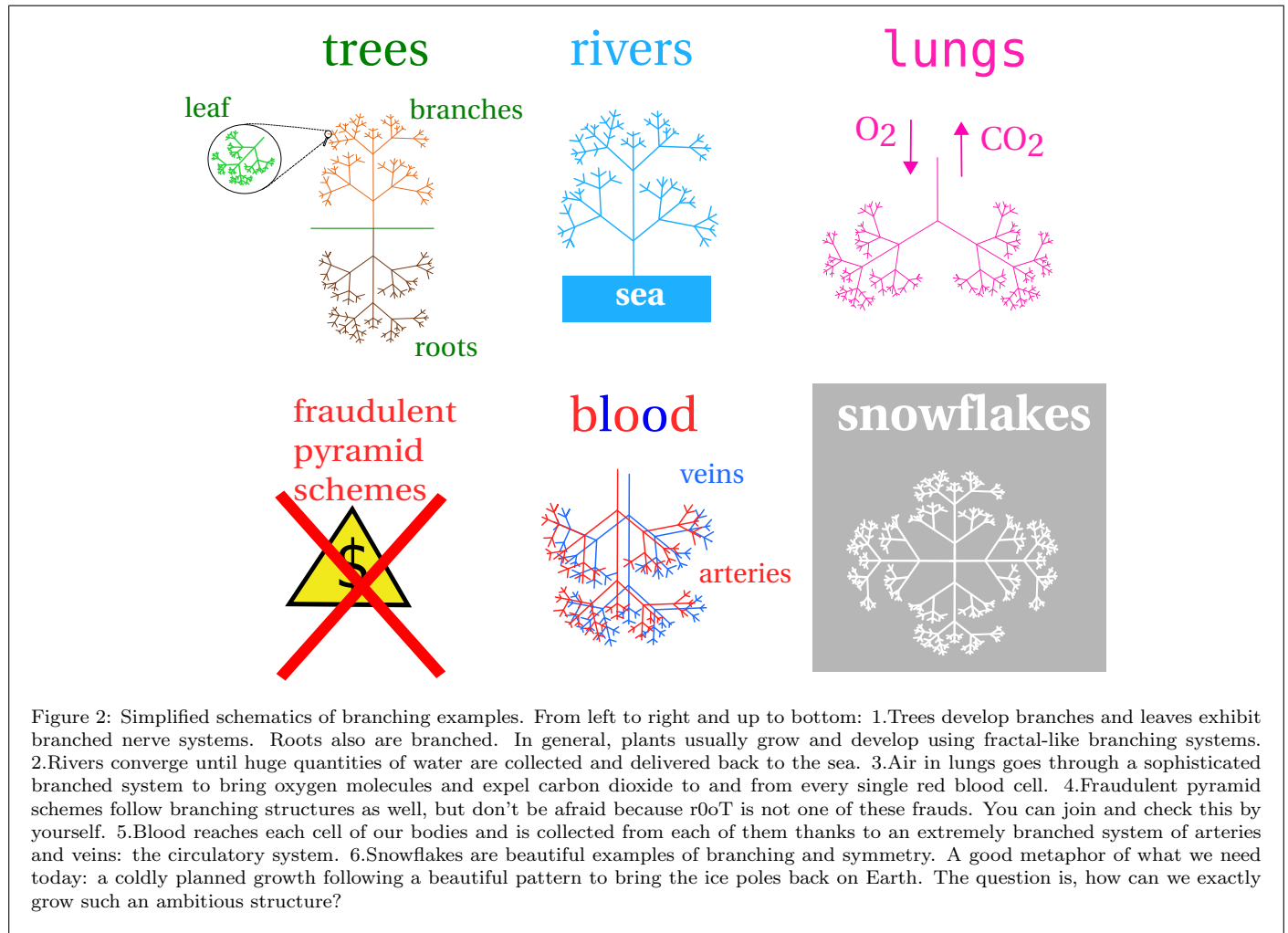
So, essentially, this text is about what to do and how, and it is meaningful once you know what is happening and how serious is it. It is no secret that most of the main activities of r0oT will target the problem of the climate crisis and the (very related) problem of poverty. It is no secret either that we need to immediately stop human population growth and to gently reduce it, to dramatically change our diet in order to stop one of the main reasons of global warming, animal agriculture [9, 13, 14], and also to cut our dependence on fossil fuels… We also need to enhance critical thinking in order to have a world with hard-to-manipulate humans, so concepts as nations and frontiers can be weakened in favor of others like world-scale laws. If you wonder how such inconvenient leaders rise to power with the votes of people, here is the answer: lack of critical thinking. This is something that needs to be learned, to be taught in schools and at home. Think about it: we write a collection of human rights without taking into account the protection of the rest of Nature, of our fellow creatures on Earth, our ecosystem, or Gaia if you prefer. Only minds without critical thinking can accept such a nonsense. The human rights cannot be a reality until they are accompanied by its necessary counterpart: the human obligations [19]. We have big responsibilities, towards Gaia and towards humanity as a whole. It is time to mature as a species, to acknowledge that we have duties. Our first one is, then, becoming coordinated to unfold the power that lies within people. In Figure 1 we have pictured a little toy model for the need of coordination. The main question, however, is *how can we actually achieve it?*

3   branching

It is estimated that, while the number of people on Earth is about $7 \cdot 10^9$, the number of cells in our bodies is over 10^{13} [20], about then thousand times more. Yet all cells receive their necessary nutrients while a huge proportion of humans don't even receive running water, not to mention proper food and education, Internet, etc. Why is so? A geneticist [21] could answer: because all cells in a body share the same genes [22], so all have the same interests, while humans, each with a small genetic variance, compete to impose their little differences in the gene pool. Well, this explains why Nature has selected coordinated cells in a body but not coordinated individuals in a species… until now. We may have little genetic differences between us, but isn't the common genetic percentage much greater? In fact, all living species on Earth share a great deal of genetic material, which means that all are our family. We are all fruits from the same family tree, daughters and sons of a common ancestor. Right now, as we have reached the ceiling of Earth's resources, the main pressure is on such tree as a whole, instead of the relative smaller pressure for selecting gene A or B in a particular branch. In conclusion, either we learn to fight together, for life in general, or we are almost all dead in no time. Right now, all living beings share the same interest: to prevent Gaia from moving to a deadly state, so we should all work together. We are today like cells in a body: mutually depending on the overall success. That is how selection pressure have become binary: either we all survive or we all die. Genes, as blind molecules, may not be directly aware of this, of course, but minds are. Minds with critical thinking are. And if minds are phenotypes of our genes, our genes also know what is at stake, or at least they totally depend on our immediate actions.

So how do cells reach such great coherence, which is what we need for our population? The answer is connectivity and branching. Our vascular vessels branch until they reach every cell to provide them blood rich in nutrients and collect used blood for recycling and recirculation. Our nervous system branches until all our body is provided with stimuli and receptors. The air that we breath is collected at the trachea and branches to the bronchi and later to the bronchioles. Then it goes to terminal bronchioles and finally to the respiratory bronchioles, where direct contact with red blood cells is possible [23]. All achieved by recursive branching. Out from our bodies, rivers use branching to collect to water until it reaches the sea. Snowflakes grow doing branching as well. Trees and plants in general develop branches, and also use branching in leave distribution and even the nerves of leaves. And of course, in roots, the inspiration for the name of this project. The reason is that, at least for some time, our coordination system will have to operate underground, as usually roots do, because the surface is currently dominated by other forces. There are many other examples of branching, and
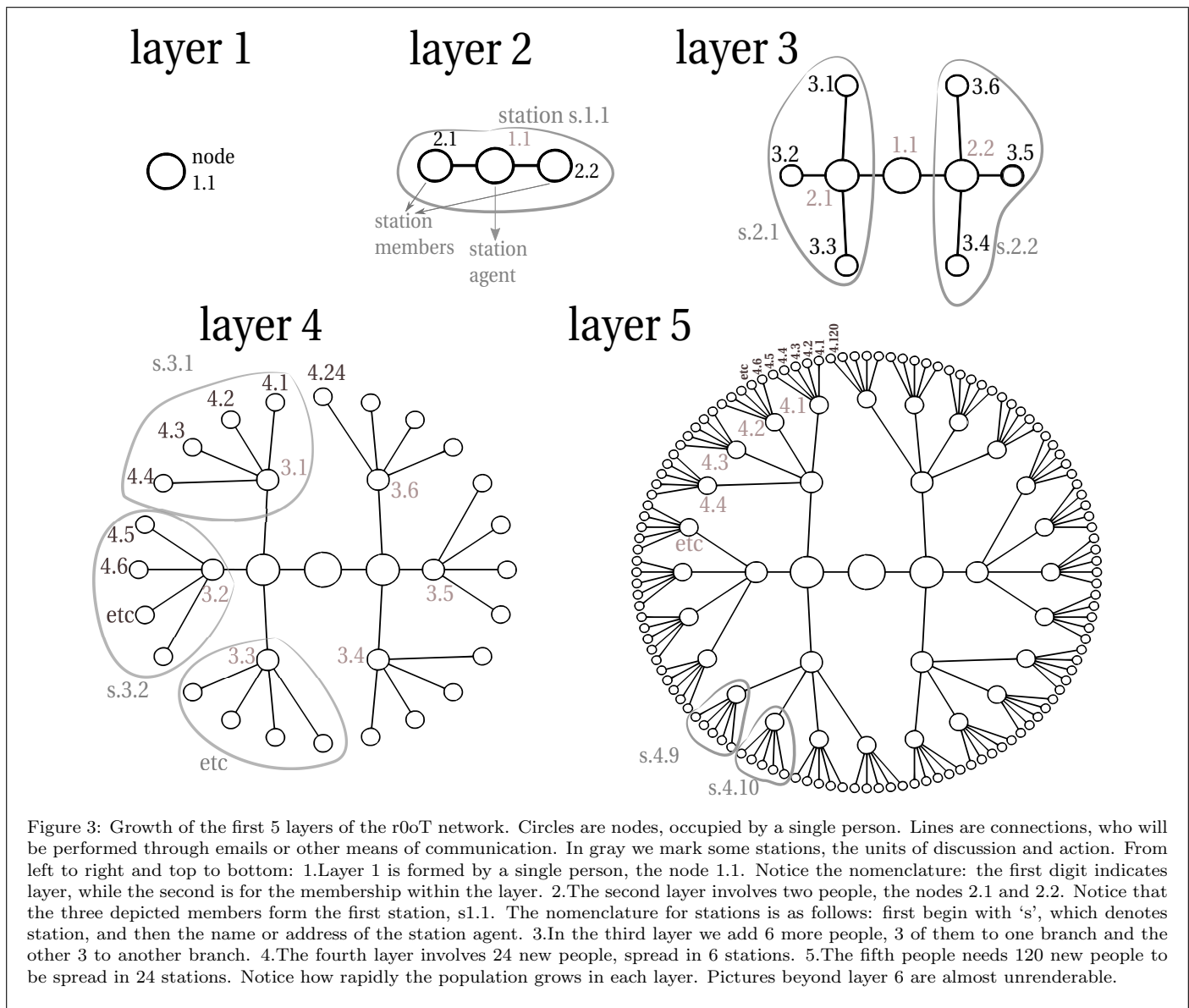
not only in Nature. An important disclaimer to be done here is that r0oT is not like one of those fraudulent pyramid schemes, illegal in many countries, in which people ask you for money with the false promise that you will receive more in the future [24]. Here in r0oT no one can ask you for money or other material properties. That would be absurd. In Figure 2 we have summarized these examples by always using the same schematic and simplified branching. Notice however that Nature allows for many different systems of branching. We, for r0oT, need to choose one of them, and start growing it. It is always wise to copy what Nature has been doing so successfully for millions of years. Let's begin.

Figure 2: Simplified schematics of branching examples. From left to right and up to bottom: 1.Trees develop branches and leaves exhibit branched nerve systems. Roots also are branched. In general, plants usually grow and develop using fractal-like branching systems. 2.Rivers converge until huge quantities of water are collected and delivered back to the sea. 3.Air in lungs goes through a sophisticated branched system to bring oxygen molecules and expel carbon dioxide to and from every single red blood cell. 4.Fraudulent pyramid schemes follow branching structures as well, but don't be afraid because r0oT is not one of these frauds. You can join and check this by yourself. 5.Blood reaches each cell of our bodies and is collected from each of them thanks to an extremely branched system of arteries and veins: the circulatory system. 6.Snowflakes are beautiful examples of branching and symmetry. A good metaphor of what we need today: a coldly planned growth following a beautiful pattern to bring the ice poles back on Earth. The question is, how can we exactly grow such an ambitious structure?

4   growth

Here is where the real action begins. We have chosen a factorial [25] branching network because it allows to encapsulate almost all human population in just 13 layers of organization, where each member interacts with very few people. This allows great global efficiency through a fast and practical local interaction. The network grows in the following manner. First, people who are interested simply follow the steps, described in the last section, to contact us, so they can join. Then, they are immediately allocated to nodes of the network by arriving order. First we fill the layer 1, in which there is just one person. Then the second layer, in which only two people are required. Then the third layer, with 6 people, the fourth layer, with 24 people, and so on. It is a factorial network because each layer n has n! members, where ! is the factorial operation that you can find in almost every decent calculator. The connectivity is as follows: the first member, called 1.1, will connect with 2 members of layer 2, which are 2.1 and 2.2. Each of these 2 people will connect with 3 more people. Each of the six people in layer 3 will connect with 4 more people, and so on. By the time we reach layer 13, almost all people on Earth are connected. In Figure 3 we have depicted the first steps of the growth process. Notice as well how stations are formed. A station is the small group or unit of people where things are discussed and reports are processed (more on this later). The name comes from (metaphorically) thinking the network as a city underground transportation system, connecting all the world in a fast and efficient way. Each station has a coordinator, or station agent, while the rest are called station members. The agent is not a dictatorial boss but just a coordinator. As we will

describe later, all matters discussed in a station will be subject to voting where all votes, including the agent's, have the same weight. Notice also that each person in the network belongs to 2 stations, one as station agent and another as member. The exceptions are those in layer 13, who are only station members (although they can be agents of extra stations, as we will see), and member 1.1 who is only agent of station s1.1. People thinking that node 1.1 is the big boss of the world are quite wrong: this node can only be in contact with the 2 people in her/his station. As we will see, people from inner layers cannot broadcast messages to the whole population, as that would be against the philosophy of r0oT.

Figure 3: Growth of the first 5 layers of the r0oT network. Circles are nodes, occupied by a single person. Lines are connections, who will be performed through emails or other means of communication. In gray we mark some stations, the units of discussion and action. From left to right and top to bottom: 1.Layer 1 is formed by a single person, the node 1.1. Notice the nomenclature: the first digit indicates layer, while the second is for the membership within the layer. 2.The second layer involves two people, the nodes 2.1 and 2.2. Notice that the three depicted members form the first station, s1.1. The nomenclature for stations is as follows: first begin with 's', which denotes station, and then the name or address of the station agent. 3.In the third layer we add 6 more people, 3 of them to one branch and the other 3 to another branch. 4.The fourth layer involves 24 new people, spread in 6 stations. 5.The fifth people needs 120 new people to be spread in 24 stations. Notice how rapidly the population grows in each layer. Pictures beyond layer 6 are almost unrenderable.

The process of growth is hard because there will not be many people receiving the news that this project even exists. And even if it arrives to them, it may be through some media who perceives this system as a threat so the message can be corrupted. For example, we can be accused of being a ridiculous and fraudulent pyramid scheme, or even labeled as dangerous terrorists only because we use anonymizing networks. Whatever they can think to discredit the project and block its development, which of course would not benefit them, they will try. We can also reach you through friends or local spreading like dead drops [26] or other free channels. It is important that we all propagate the message of this project, but it is hard to reach the total population. As is usual in networks and nonlinear phenomena [27], there is probably a critical stage at which our growth can be explosive and unstoppable, but until then, it can be hard and fragile. But we think we have to try it anyway. There is too much at stake. The initial members will be allocated directly by us, the founders of r0oT, but the idea is that each new member opens email addresses that can be used as entry doors as well. We, the founders, will not directly participate in the network until the fourth layer is completed, so we can rapidly dilute in the network. And even then, all the members will participate anonymously, or at least with some degree of anonymity. At least the first 9 layers need this in order to operate without being easily identified [28, 29, 30]. Now you can ask: OK,

we the people are the nodes of the network, an underground system formed by connected stations where the links are relatively secured by anonymizing tools such as encrypted emails, but what it is that flows through the whole system? In blood vessels we have blood, in respiratory systems we have air, in rivers water, in plants sap. What is the liquid or gas that flows in r0oT?
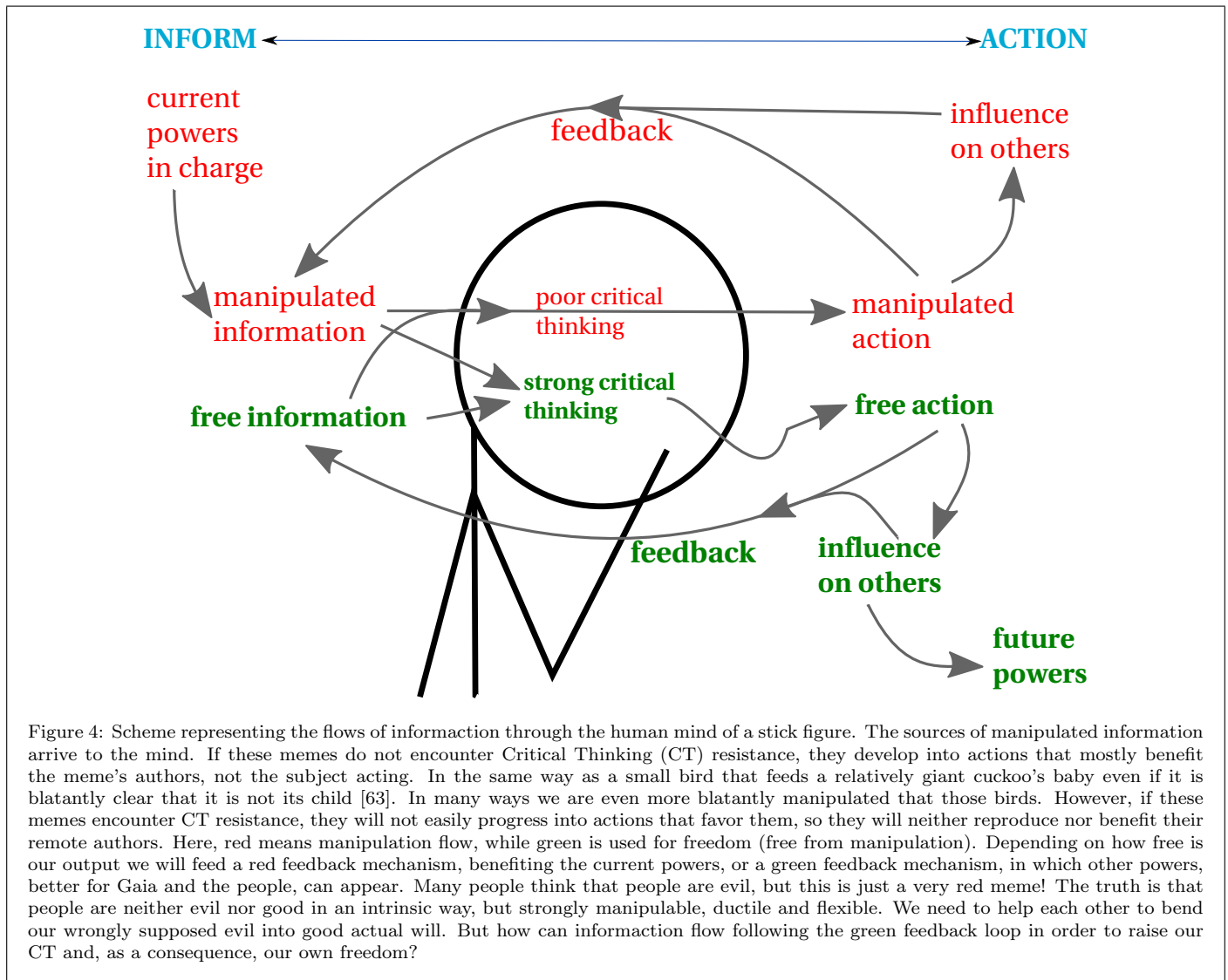
5 informaction

Yes, this is the answer: informaction, = information + action. It is the most important concept in r0oT. There is no use in considering information or action in a separated way here. Different information will produce different actions, as different causes usually produce different effects. And different actions will provide different information in the world and how this information is spread through the population. That is why we have coined this handy term that already expresses the close relationship between these two capital concepts. You surely have listened or even said a thousand times that 'people are bad', 'people are evil', 'we are already doomed', 'as long as I don't see it, it's OK', and many more sentences like that, when thinking about global poverty or climate change. These sentences are just pieces of information, and you say them *because you have listened others saying them*. Now ask yourself, what are the actions produced by that information? Your are right, no action at all! These sentences are clever pieces of information whose effect is to block any hope, and by extension, any action to change the world. Now ask yourself again, who benefits from such stagnation? Again, you are right, the powers now in charge. If you don't act, they can maintain their status quo. So simple. Just as genes fight to persist in time through reproduction, memes also reproduce in our individual and collective (Zeitgeist) minds. Memes are pieces of information, like genes, and they have effects on the real world. The effects of a gene is called phenotype, and we don't need to coin a new term for memes (like 'memotype'). We just consider the phenotype as the effect of genes + memes. Well, the action-blocking sentences listed before are very effective memes put in our minds by those who benefit from them. Don't be surprised: Nature is full of these tricky mechanisms at the gene level [31], so why don't we expect them at the meme level? In fact, in r0oT we can benefit from it by creating memes that can benefit the whole ecosystem and the whole human population. The concept of 'Gaia' [32, 33, 34] is in fact such a good meme, as it is 'life', 'consciousness', 'agency', 'soul', etc. They are very useful concepts that express powerful ideas that are nevertheless hard or even impossible to define with a global consensus [35, 36, 37].

The first priority in r0oT is to be a global school, one in which the main topic to learn is *critical thinking*, something rarely taught at regular schools today. Critical thinking (CT) is the only way to make our decisions free, otherwise we are just being easily manipulated. Here we name a few basic aspects of CT or simple steps to enhance it. Take it as an incomplete suggestion list:

- Freedom is not about what you can or can't. For that, there is already the concept of power. Freedom is about what you *really* want, in a wide, broad and long term sense. [38]

- You should question everything you know, read or listen.

- Ask, for every idea you are faced with, who is getting some benefit from it and who becomes damaged [39].

- When considering benefits and damages, evaluate not only short but most importantly long term.

- Purge as many manipulative or brain-washing ideas from your mind. This is not an easy task to accomplish, but it is worth trying.

- Read the great pillars of CT: From Plato and Aristotle to Montaigne, Voltaire, Spinoza and Nietzsche, among many others. Independently of their ideas, they can provide a CT architecture in your brain. Please excuse our bias towards occidental roots. We are sure other cultures have plenty of classical works and great authors as well.

- Read great literature, from Aeschylus and Sophocles to Shakespeare and Calderón, among an almost infinite list. Those authors have explored the many lights and shadows of the human soul. You will know human beings better afterwards, including yourself.

- Most visual entertainment, especially TV programs, make you a passive viewer. There are other types of entertainment (documentaries, stage arts, . . .) that request you an *active* role as a listener and as a thinker.

- Immerse yourself into the arts, ancient and modern. Arts will help you to appreciate beauty and will develop your sensibility. Without this, how can you appreciate the love for Nature and recognize the suffering of other creatures?

- Science is not just a technical specialty but the quest to understand the natural world to which we all belong. It is important to know the basics of the scientific knowledge in order to understand the origins, the mechanisms and the future of our world.

- Don't take any authority for the sake of of it, even if the words come from a bunch of Nobel laureates [59]. Truth does not need trust. And no one but time can speak in the name of science.

- Engage with your close acquaintances in conversations about topics that are relevant to you and your environment. To dialogue with other people helps to contrast your lines of reasoning with others, so you can enrich them.

- A good CT begins by a strong self-connection. In order to enhance it, you can talk to yourself, writing a journal, meditating, ... One of the main reasons of the acute self-disconnection that we experience today is due to the bad use of our current technological tools. With the promise of connecting you to the world, you can easily end up disconnected from yourself.

- Be balanced in all aspects. Great scientific minds with high IQ's without sensibility or emotional intelligence are as harmful to the world as great artists with no scientific knowledge. The former can put their abilities to the interests of big current powers, while the latter can be easily manipulated when technical terms matter, and it is usually the case.

Figure 4: Scheme representing the flows of informaction through the human mind of a stick figure. The sources of manipulated information arrive to the mind. If these memes do not encounter Critical Thinking (CT) resistance, they develop into actions that mostly benefit the meme's authors, not the subject acting. In the same way as a small bird that feeds a relatively giant cuckoo's baby even if it is blatantly clear that it is not its child [63]. In many ways we are even more blatantly manipulated that those birds. However, if these memes encounter CT resistance, they will not easily progress into actions that favor them, so they will neither reproduce nor benefit their remote authors. Here, red means manipulation flow, while green is used for freedom (free from manipulation). Depending on how free is our output we will feed a red feedback mechanism, benefiting the current powers, or a green feedback mechanism, in which other powers, better for Gaia and the people, can appear. Many people think that people are evil, but this is just a very red meme! The truth is that people are neither evil nor good in an intrinsic way, but strongly manipulable, ductile and flexible. We need to help each other to bend our wrongly supposed evil into good actual will. But how can informaction flow following the green feedback loop in order to raise our CT and, as a consequence, our own freedom?

The difficult thing with a poorly trained CT, also called a washed brain, is that a manipulated mind will not easily recognize that it is so, otherwise it would be less manipulated that it seems. But there are some hints to recognize strong brainwashing in your head. If you identify yourself or become irritated with some, you can be quite sure that you have been under significant manipulation:

- Since you were born, you were taught that you need meat to be strong, dairies for your bones, fish for your memory, etc. You were also taught that cows, pigs and chicken, among others, live happily on the fields. The actual facts

are: Animal agriculture and fishing are some the biggest causes of climate change [9, 13, 14, 15]. An animal based diet can damage your own health [16, 17, 18], while a plant based diet prevents many diseases and is perfectly viable and healthy [40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51]. It is even compatible with great physical activity [52, 53, 54, 55, 56, 57]. Last but not least, animals in the whole food industry not only live under deplorable conditions, but they also undergo abuse, mistreatment and deep suffering before facing massive slaughter [58].

- You have nationalist, patriotic feelings of any kind. There is nothing bad in loving your place of birth, but there is great harm when this acquires political and legal implications. There is no single scientific reason to distinguish two people from the place they have been born. It is like believing in the horoscope, thinking that one constellation influences you more depending on your time of birth.

- You don't think climate change is real or extremely urgent, being humans the cause of this [60, 61]. Strong scientific evidence shows the opposite [62].

- You buy more clothes and objects than you really need, without knowing where do they come from and at which human and environmental price, and you just consider that the true price is the one reflected on the article [10].

- You are not rich and vote for a right wing party in elections, when their goal is to defend the interests of the richest. If you vote them, you are actively involved in the building of social inequalities.

- You are not very worried by the values you and schools teach to your children with respect to the future awaiting for them.

- You get irritated by the mere suggestion of being manipulated. A good critical thinking accepts that manipulation at some level is unavoidable: the goal is to reduce it as much as possible, but it first needs acknowledgement of its existence.

In Figure 4 we have represented the feedback cycles of informaction. One of the main goals of r0oT is to help accessing free information and building free minds in order to disrupt the cycle of manipulation that the global powers try to imprint on us everywhere from ads, to school programs or news channels. If you consider yourself a person with a high degree of CT, then you can consider the importance of acting in order to enhance it in other people. Among all other things, this is what r0oT is aimed to, or at least its first fundamental step. One of our lemmas could be that CT is much more important than IQ, and they don't always come together. So, summarizing, we have an structure to provide coordination and we know what is flowing through it. The next question is: how are the specific mechanisms of it?

6   processing and transmission

In r0oT, information is processed in stations in the form of *reports* and they are mainly transmitted through the Internet, usually through relatively secure email services like Tutanota [64] or i2p secure mail [65]. The idea is simple: a station receives a report from another neighbor station, so the members and the agent have some time to process and resend it to their own neighboring stations. Each report can contain information alone or include proposals of direct action as well, so both aspects have to be dealt with. Once the action is performed and the information is processed, the station forwards the updated report. Where? There are four directions in which reports are received and sent. First: angular flows, where we communicate with our two next-neighbors in our same layer. Not a big processing is required to forward in angular directions, because both belong to the same radius or layer in the overall 'onion'. The angular direction has two variants: clockwise and counterclockwise. If we receive a report clockwise, we forward it clockwise, and the same for the opposite sign of rotation. Radial directions are more elaborated, since they involve a change of layer. Reports travel radially in two ways: outwards and inwards. If we receive a report that comes from an inner layer, then we propagate it outwards. But if we receive it from an outer layer, we propagate it inwards and also outwards to those branches where it did not come from (notice that a station will receive an inward report from just one of the many branches it connects, so we need to propagate the message outwards to the others). Apart from all this, the informaction needs to be transformed when it changes layers. The most inner layers will deal with more abstract, universal concepts, while outer layers will need to deal with informaction in a more practical, direct fashion, and always adapted to local idiosyncrasies like for example local languages or cultures. Global, inner layers will use simple English to communicate while local layers can use local languages. It is then necessary for the station to adapt the contents of the reports to the layer it targets, and only with time we will all learn how to do this well, what is more appropriate for each layer. Of course, each report will reflect the history of previous reports on a given topic, for everyone to check its evolution and detect possible manipulations. Furthermore, reports can be merged and split as needed.

Each report will come with a priority number (PN), from 1 to 4. If PN=1, it means the report has slow speed of transmission. This does not mean that it is not important. On the contrary: a very important topic needs longer times to be thought, discussed and processed. So if PN=1, the station must forward its processed report within 28 days. If

PN=2, we have a medium speed report, in which the station has 14 days. The propagation speed will increase but the quality of processing may be lower. PN=3 will imply fast mode, with 24 hours to resend it. Finally, PN=4 will imply maximum speed priority, in which almost no processing will be done. Depending on the topic, sometimes speed will be more important than processing, or the opposite. The relevant thing to understand here is that we cannot maximize both speed and processing. PN numbers can change in the course of its travel along the network, but the details of this, as with many other topics, are not the goal of this introductory text. In Figure 5 we show some of the details of informaction speed and processing as well as other aspects of the network.
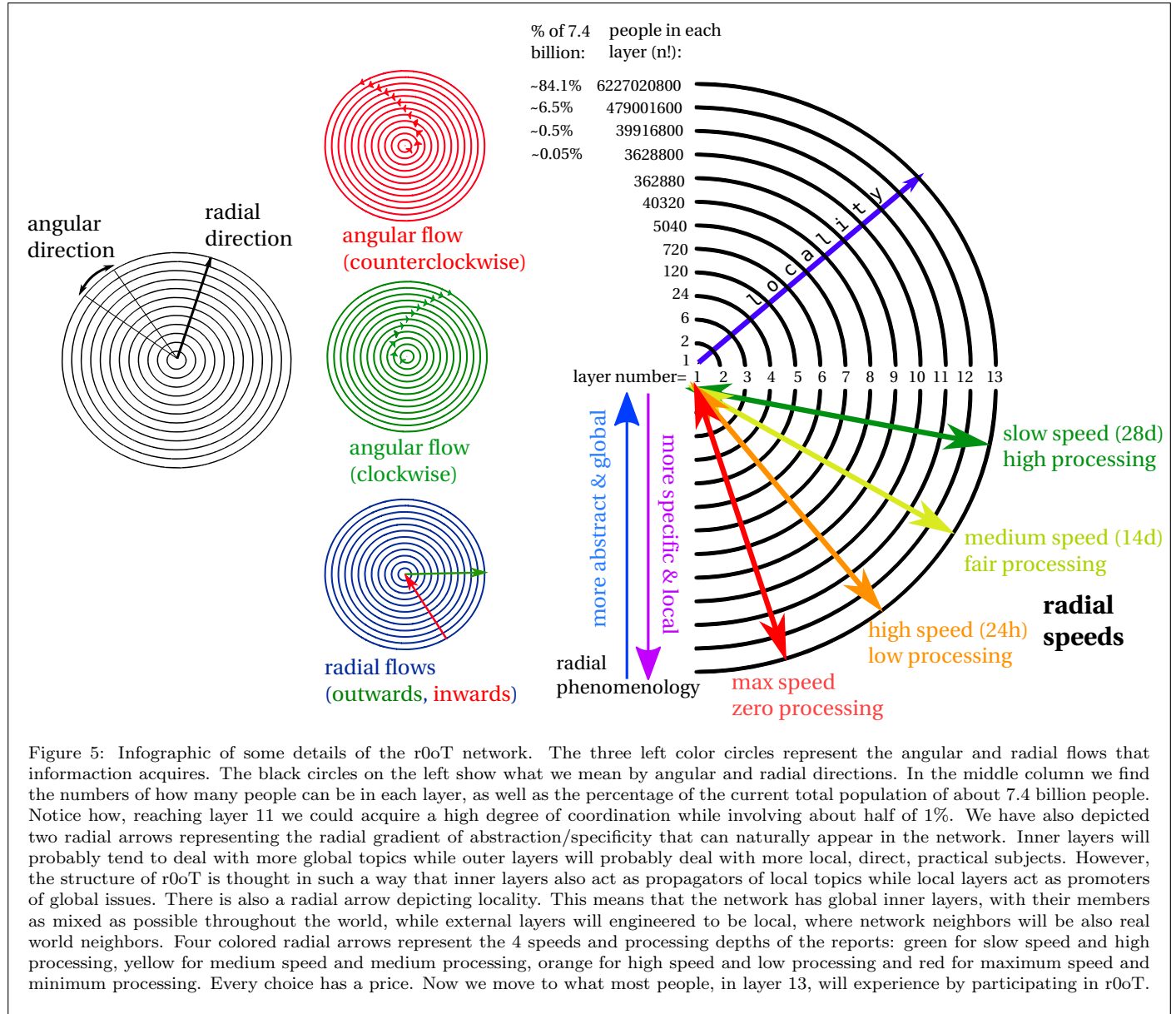
Figure 5: Infographic of some details of the r0oT network. The three left color circles represent the angular and radial flows that informaction acquires. The black circles on the left show what we mean by angular and radial directions. In the middle column we find the numbers of how many people can be in each layer, as well as the percentage of the current total population of about 7.4 billion people. Notice how, reaching layer 11 we could acquire a high degree of coordination while involving about half of 1%. We have also depicted two radial arrows representing the radial gradient of abstraction/specificity that can naturally appear in the network. Inner layers will probably tend to deal with more global topics while outer layers will probably deal with more local, direct, practical subjects. However, the structure of r0oT is thought in such a way that inner layers also act as propagators of local topics while local layers act as promoters of global issues. There is also a radial arrow depicting locality. This means that the network has global inner layers, with their members as mixed as possible throughout the world, while external layers will engineered to be local, where network neighbors will be also real world neighbors. Four colored radial arrows represent the 4 speeds and processing depths of the reports: green for slow speed and high processing, yellow for medium speed and medium processing, orange for high speed and low processing and red for maximum speed and minimum processing. Every choice has a price. Now we move to what most people, in layer 13, will experience by participating in r0oT.

7   locality

Until now we have essentially described r0oT from the inner layer perspective. This is natural because what we need to do first is growth from within. However, the most interesting aspects of this network occur at external layers. At these layers, people participating in neighboring nodes will be close neighbors in the physical world too. But living spatially in the same building or street does not necessarily make us acquaintances. There is a lack of interaction between people living at a common place, especially in big cities, and such a cold distance only enhances incoordination even more. This, as problems grow harder, will need to change. People living close to each other share a great deal of needs and interests, like running water, food supply, residue management, etc, and probably share the same fate. Currently there are many

cooperatives that try to bring solutions to local problems, but in general we don't see, at least in big cities, a strong sense of community. With r0oT this should change, since it promotes a strong interaction and cooperation between actual neighbors. It is quite desirable, for example, to buy food directly from local farmers, or even to produce your own, to actively participate on what and how is taught at local schools, to make use of solar energy from all building roofs, to increase the support on people with tough difficulties, to directly manage the space by maximizing vegetation and supporting local fauna, to become rebels that substitute the asphalt streets by orchards and trees, to talk to other neighbors to inform them on what we all need to face, to block the entrance and use of any damaging product or the application of a damaging policy from the local laws. To take over our space and convert it into a place as personal, sustainable and coordinated as possible. We neighbors need to be strongly coordinated to be strong towards the future. And r0oT provides the structure for the interaction that such cohesion requires.

An additional feature of r0oT is that already existing local associations that are not part of our system can bind them to the main network in a simple way. Each association needs to nominate a representative member to be the link as a 13 member. Then, the informaction originating in such association can travel through r0oT, while informaction from r0oT can reach the association as well. Examples of this can be labor or trade unions, neighbor associations, parents grouping together to deal with children related issues, etc We call these attached groups 'extra stations' or 'extrations'.

The general idea here is that r0oT has a double purpose from the local perspective. On the one hand, inner layers act as propagators of local problems and as active actors towards finding solutions. For example, a factory somewhere could not be paying fairly to some workers, or is doing some injustice of any kind. This needs to be traduced to a r0oT informaction impulse that will escalate to inner layers. From them, global actions could be proposed, like the blocking of the company's products until the problem is properly repaired. But on the other hand, there are global problems that only through a powerful channel can reach each place and person in the world. For example, we all need to know what are the real data and expectations for the future concerning the climate crisis. Without r0oT, this information is not arriving to everyone in a clear way. In short, a strong coordination like the one r0oT proposes allows every person and creature to have a universal voice that will be heard by everyone, while at the same time allows global issues to have voice and be heard at every home.

8 Democracy

At this point you may have wondered whether someone joining r0oT in the first place remains forever there, or whether someone joining r0oT in the future at layer 13 but with the will of participating at inner layers must be stuck at 13. The answer is a clear no. In the growth process we will allocate people by arriving order, but these are only initial conditions that will have nothing to do with the dynamic equilibrium that has to be acquired afterwards. For example, some people interested in r0oT may join at the first stages but then realize that their interests are more close to the local people. Of course, they can move to more external layers. If someone wants to remain in the same layer but changing station, it can be done as well. There are no better or worse positions, only more abstract or more practical places, more global or more local. Everyone can target the layer that suits better to her/him.
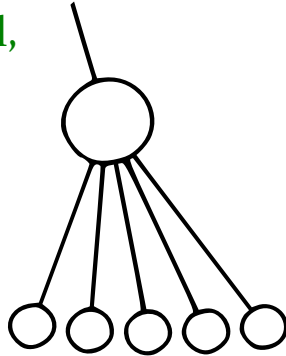
Have you ever noticed how left-wing parties are more democratic but extremely inefficient, with their never ending and chaotic assemblies, while right-wing parties, with their disciplined hierarchies, are less democratic but more efficient? At the end, take a look at the world now and guess who is winning: democracy or efficiency? Even when a left party wins an election, it is only a matter of time that it moves to the right when it seeks more efficient structures and mechanisms. In r0oT, however, we can combine the good of both approaches, by building a network which already provides the efficiency and a democratic dynamics to give to people the real power. Specifically, we articulate two types of democracy: local and global. Local democracy is very simple: it consists in voting each decision that a station makes, where the voters are simply all the station members. This is fast, practical and very efficient. But not universal.

Reports are not the end of the story in the discussion of r0oT. Each station must also work to have a set of recommendations or principles for its whole stemming branch. Maybe in the future these sets can substitute real world laws. It is too soon now to talk in these terms, but if r0oT works, why not? If politics is about coordinating actions to act for the global good of people, isn't r0oT a political structure? Surely it is, but it is not clear whether in some future it can or cannot substitute real politic powers. For now, each station, instead of rules or laws, will simply write some principles, to be divulged through its stemming branches. They will never be imposed, but they need to be taught, discussed, understood and eventually changed. Ideally, at the most inner layers, a collection of human rights and *human obligations* should be written, and approved by all. The point of global democracy is that any change in these station principles or recommendations must be voted by global democracy, by all the members stemming from that station. If it is something related to the principles of s1.1, then everyone must vote to approve a change. In local and global democracy in r0oT, every change must be approved by a majority of at least 2/3 of the total. Otherwise the issue remains unchanged. Finally, every principle stated in a station must be compatible with the principles stated in inner stations, so equality and universality are ensured. In Figure 6 we depict the graphical difference between local and global democracy.

Another aspect very related to democracy is mobility. At least each 28 days, each station will vote for its new (or
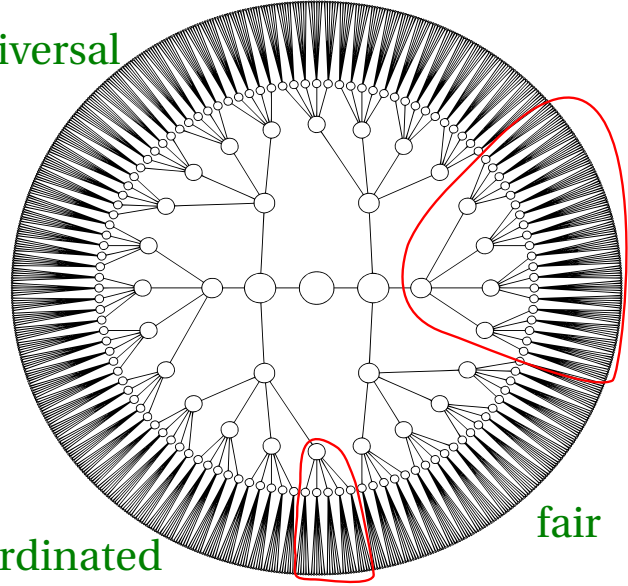
Figure 6: Depiction of local vs global democracy. What affects a single station is voted in the station. What affects a branch must be voted by the whole branch. What affects the whole network must be voted by everyone. On the right we have depicted some branches with dashed red lines. Branches always stem from a specific station. Local democracy allows the system to be very efficient while at the same time to be democratic, but global democracy ensures that the same principles are applied everywhere. Only in a world where the rights and obligations are the same to everyone we can speak of true justice and democracy. In our current world, there are many different countries with many different sets of rights and laws, and it is not just that some are more fortunate than others by the mere accident of being born here or there: it is that in the countries with more 'freedom' and 'rights', we take advantage of the other 'lesser' countries to have cheap workers under unfair conditions so we can obtain cheap and nice goods to buy. In this context, Gaia, the Earth, is the last country on the list, the country that nobody takes care of, the one that offers the cheapest products. We need to revert this order and put Gaia first.

re-elected) station agent. The election will be among those who are willing to be such agent, unless nobody wants to be, so all of them become candidates. An agent can also declare that she/he does not want to be voted. With this mechanism we acquire radial mobility, and people more suited to inner layers can penetrate the onion while people with more local and practical nature can go to a layer of his/her satisfaction. But of course, to go to inner layers, other members must allow you to do so. Angular mobility will imply the permutation of two members of two different and closely located stations of the same layer, upon mutual agreement. In Figure 7 we depict these processes.

9   immunity

At this point of the description you surely have wondered whether this network can be robust against attacks, infiltrations of any sort or just external/internal infection or corruption. The answer is that, being made of humans, a bare r0oT network is easily corruptible. Our body would also die very rapidly if we wouldn't have a strong an efficient immune system. Total immunity cannot be achieved, of course, and even autoimmune diseases can appear. (Notice how we are now considering r0oT as an organism, as an organized collection of individuals that try to work for the global good.) How can we achieve a fair degree of immunity? Clearly, by creating a parallel and independent network that can specialize in what immunity means: 1) identify a problem that is threatening the organism, and 2) solve the problem. The idea is simple, but it can add some complexity to an already complex set of ideas. We create another network, called *i1* network, where members are connected in the same exact way as in the main network. They form stations as well and follow the same dynamics and principles. But with one additional thing: each station in the main network has always an i1 member in it, trying to ensure that all the dynamics of r0oT are properly applied and most of all, trying to identify focuses of information manipulation. They can even act when a member simply is too inactive. But before going into more detail, we show in Figure 8 some aspects of the immunity i1 network. In Figure 9 we show how the coupling between the main and i1 networks occur.

The criteria for an i1 member to act are very simple and clear. If a member does not show in the network as active, it will be reallocated to an external layer, layer 13 if the network is already full, after 3 attempts to contact her/him. If
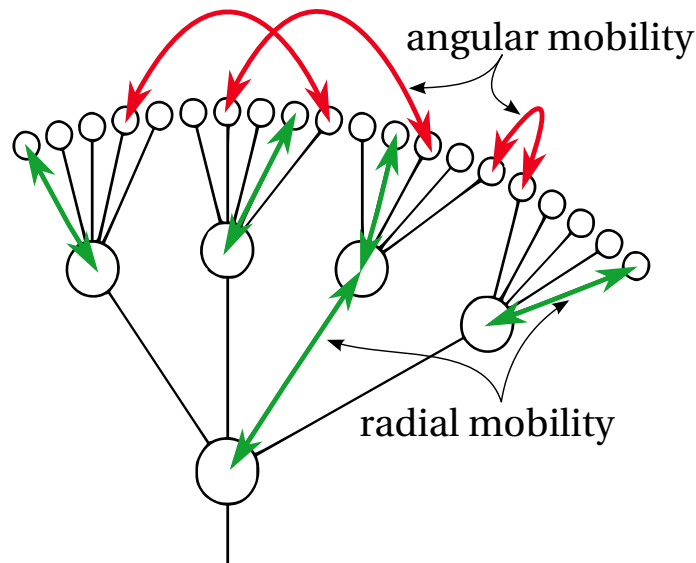
Figure 7: Radial and angular mobility within the network. Radial permutations are performed by local democracy while angular permutations are performed upon mutual agreement of the two willing members.

the problem is the type of activity that the member is performing, then they will follow these criteria:

- Gaia, the whole ecosystem, is more important that any of its parts. Humanity, in this context, is just a part of Gaia. So Gaia has a higher priority than humanity. After all, without Gaia there can be no humanity at all.

- Humanity as a whole comes before any particular subgroup of humans.

- Etc. The pattern is simple. The more general the system, the greater its priority.

Every action performed by the i1 member of a main station must be approved by the i1 station to which the i1 member belongs as a station member (and not as a i1 station agent). However, if the issue is bigger and affects more than one main station, the i1 network can coordinate to temporarily perform a fusion of main stations to deal with the problem, and even to perform a cut and paste of the main network, expelling or reallocating those problematic members. If you join r0oT you will able to see the proposed technical details for these complicated matters, discuss them and work for better versions of them.

The cost of building immunity networks is high. We need many more members that instead of working for the main purposes of the main network, need to be working for the integrity of the system. We think the effort pays off, because in r0oT we are fighting very big powers that are well established and with many resources. It is natural to expect that they will try to discredit this project from the outside and blow or kill it from the inside. That is why people willing to enter r0oT will need to include people willing to enter the i1 network as well. As your real identity is not revealed here, nothing prevents you from opening multiple accounts, even at the two different networks, main or i1. However, unless you have a huge amount of time, your efficiency will be below what is desirable. However, the cost of the i1 network is much lower than the cost of the main network. Notice that it is a network coupled with the main one with one degree of layer shift, so at the main layer 2 we have the first i1 layer, when we are at main layer 3, we are at the second i1 layer, and so on. Arriving to the 13th main layer would imply a need of a 12 layered i1 network. Adding more layers of immunity, i2, i3, etc would cost less and less but would increase immunity more and more. We think it is justified. Watch the corruption around you. The world is plenty of it. Maybe it is one of the main reasons of the current and deplorable state of Gaia. It's worth the effort. Those of you who have a clear fighting attitude in favor of Gaia should join the i1 network, no doubt about it. We need there constructive and radical people with no hesitation to act against a behavior that would affect to all.

10 specialists

There is only one missing piece left in this system: the technical, specialist knowledge. We, regular people, are specialists in normally one, maybe two disciplines, if any. We need the knowledge of the professionals. Surely they will be there, somewhere scattered through the network, but we need them to be coordinated as well and with close interaction with
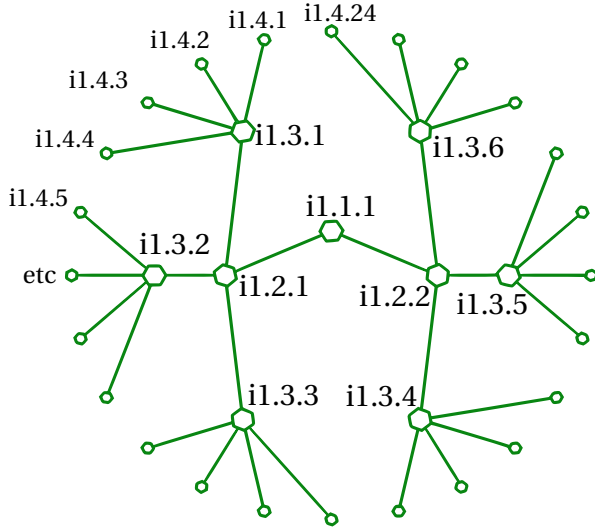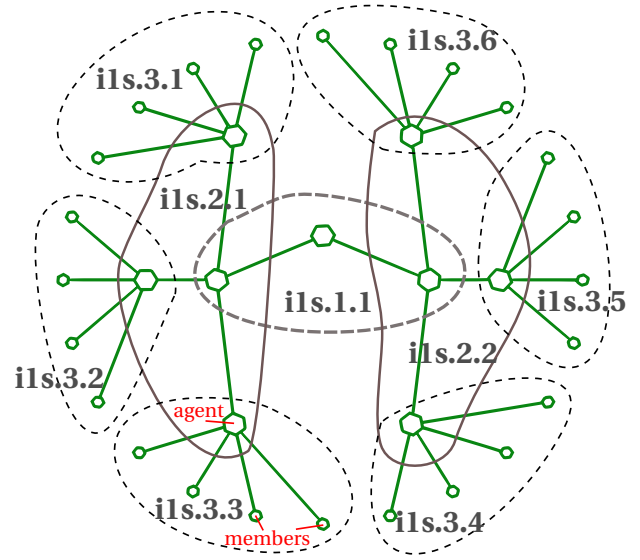
Figure 8: Depiction of the first four layers of the i1 network. On the left we show the nodes (hexagons to distinguish from the circles of the main network) and their connections. We also see that the nomenclature is the same as in the main network except for the fact that we add the label i1 as the first 2 digits. On the left we can see the stations that i1 members form, applying the same principles as in the main system.

society. And even more importantly: we need an *uncorrupted* knowledge. We cannot depend on the technical advice that some people give us while they depend on money given by the current powers. This is happening today in science [66, 67]. If a voice is raised against some interests, it is easily cut on funds. We need, for example, the hugely important knowledge of farmers [68], but without the filters of economic interests of the giant biotech companies or the big agribusiness corporations. We need to discuss once and for all whether we should expand our nuclear fission energy use or not, a type of energy that is usually rejected by big environmental NGO's and general public but which has a very low degree of carbon dioxide emissions[33, 19]. More over, we cannot allow that a big proportion of the knowledge that originates from public funding ends locked under private journals[69]. Many scientists need to change their attitudes and have the will to publish *for* Nature.

That is why we create the specialist networks. The details are a bit complicated, so here we describe just the essentials. For each discipline of knowledge or craft we will create a network, with almost the same structure as always. They will be connected by stations, and with all the dynamics described before. And they will have an immunity network dedicated to each of them, so if we create the network of farmers we create as well the associated i1 farmers network, and so on. In this case, it is important that you join r0oT twice, one as a regular or i1 member, and another as a specialist in your main discipline, or as an i1 member of your main discipline, as you prefer. Once a specialist network is created, is coupled to the main network as depicted in Figure 10.

The engineering of specialist networks is a bit complicated, but the idea is that each specialist network will be visiting a branch at each time, with one specialist per main station temporarily present at such branch. During those visits, there can be an exchange between society and technical communities. We think that these networks can benefit not only society but also the specialist community involved in it. There is an immediate and direct self-benefit by the mere fact of being organized. The visiting system consists in staying some time at one branch, and then jump (angularly) to the next. During that time, main and specialist reports can reflect the interaction between both networks. Specialists need to be in contact with society and society with specialists, in a direct way. The role of a specialists in a main station, as visitors, is to collect information from the main members and also to tell how their specialty can contribute to the problems of society. The problems of the specialty can also be passed to society, for example the need for more funding or more social recognition, or their importance to specific problems. It can also be fun and refreshing to learn from many different specialties just for the sake of knowledge.

As a specialist network grows in number, it will increase its degree. The details of this metamorphosis are quite complicated to be discussed here. A final and important point in this topic is that the technical knowledge does not always need to be so compartmentalized as it is usually the case. For example, a chemist and a physicist can benefit from interacting, and physics and chemistry in general can improve too. The specialists networks can organize mutual

coupling of **i1 network** and **main network**

main network stations

further immunity: i(n) netwoks

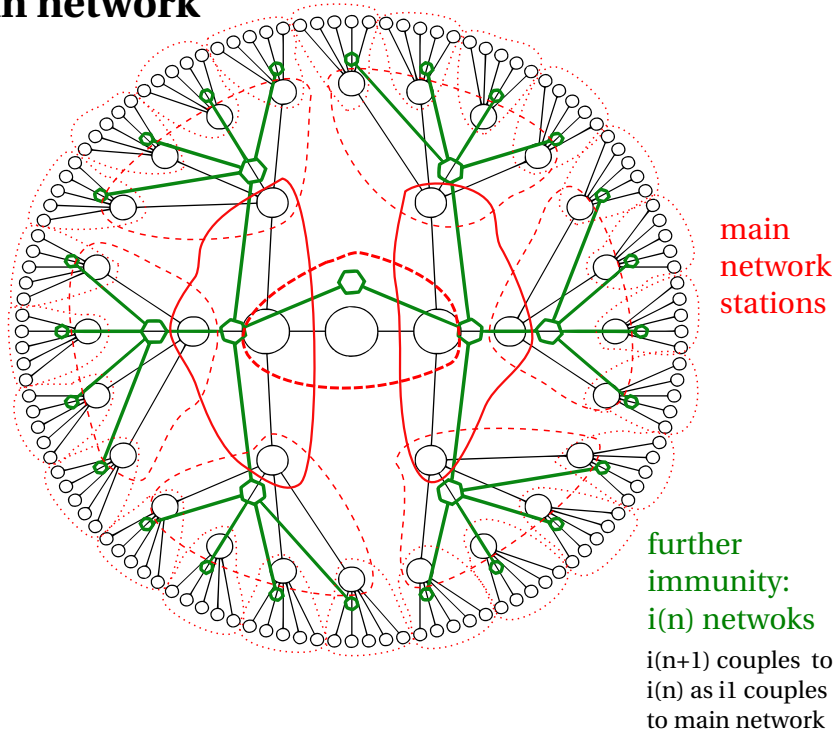i(n+1) couples to i(n) as i1 couples to main network

Figure 9: Coupling of the main and the i1 networks. The main network is depicted in black with circular nodes while the i1 network is depicted in green with hexagonal nodes. The stations painted here are those of the main network, remarking how in each station there is always present an immunity member of i1. We can see a side note pointing to the possibility of building further immunity networks, i2, i3 and so on, in order to reinforce the robustness of the whole system. For now we will try only with i1, but if necessary we can build the others. If they were to be created, they would have again the same structure as the other two, and the coupling would be very simple: the i(n+1) network would couple to the i(n) network as the i1 would couple to the main system.

visits or couplings if they wish, or if recommended by the main network. Knowledge is sometimes better when not compartmentalized, as sometimes very important things are lost at the frontiers between different fields. That is why when creating the specialists networks, a hierarchy of disciplines needs to be created, by categories and subcategories. For example, the physics and chemistry network members will also belong to the science sp network. There is no need to subdivide categories ad infinitum because that would mean a lot of implication of sp members, having to visit too many stations at once. The hierarchy needs just to ensure that there is not a harmful and excessive sub categorization as sometimes happens and that some level of constructive mixing is put into practice. For example, ecology + teaching, or technology + philosophy could provide great insights if they would periodically couple together. The principal idea is that each main station can be frequently visited by experts who can provide a fruitful and necessary exchange. This, in short, will dramatically increase the efficiency of global coordination and will try to avoid corruption in the technical world, a serious disease we suffer today. We need to acknowledge the fact that the big problems that we need to face need a strong social coordination between people and also the implication of the technical, scientific and crafts communities in order to search, find and execute intelligent and wise solutions.

11   join

Joining r0oT at this first stage is very simple. Just follow these steps and you will be in:

- Download the Tor Browser [70] for your operating system (OS). Needless to say that in r0oT we should promote open source and free OS like Linux. But don't worry, Tor Browser is available for most systems. You can even use Tails, an OS devoted to Tor and privacy [71]. Tor will allow people from countries where Internet suffers high levels of censorship [72] to participate in r0oT.

- Open Tor Browser, go to Tutanota [64] and sign up with an invented nick without giving any personal information. Currently, Tutanota allows signing up from Tor. That is why we recommend it. Tutanota, a service with a free plan

14

rotating visits

4th order
specialist
network

1 specialist
per station

3rd order
specialist
network

each has
its own
immunity
system

3rd order
specialist
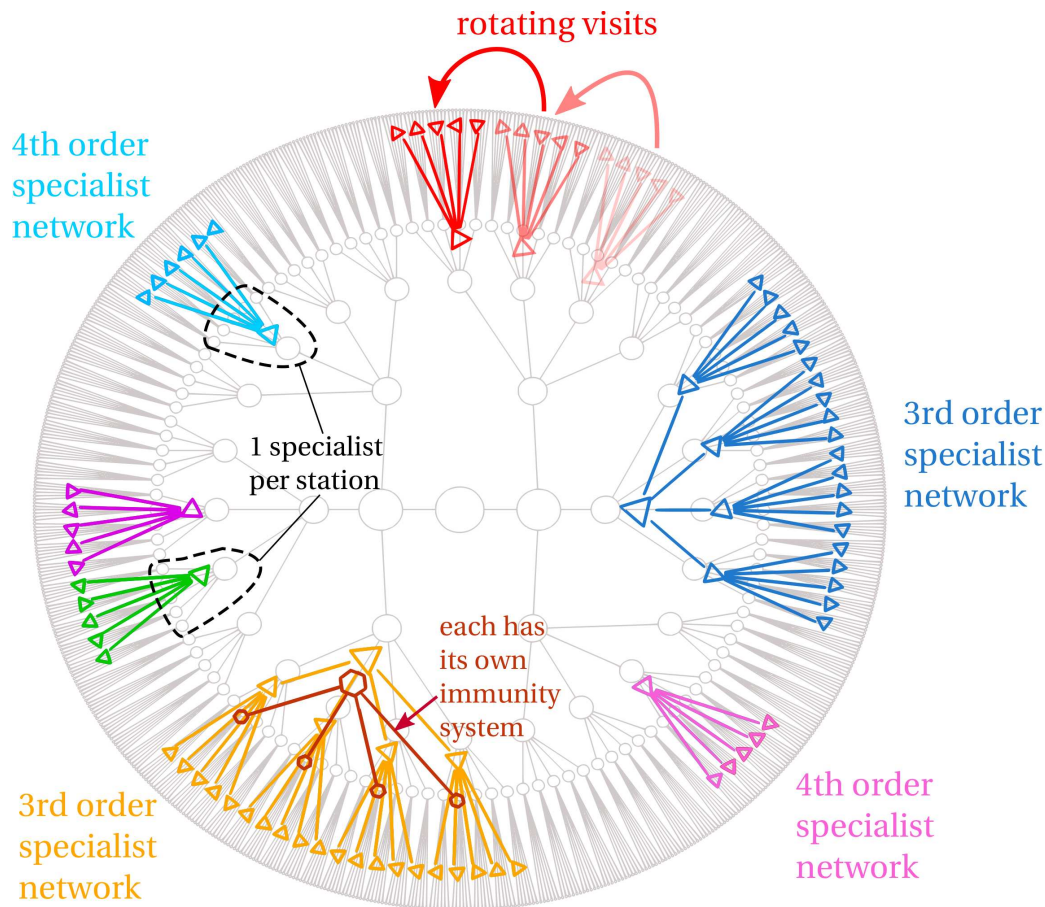network

4th order
specialist
network

Figure 10: Specialist networks. We show 7 different specialist networks. We don't show nomenclature even if it is simple enough: add a 'sp' as a prefix and follow the usual nomenclature. Immunity-specialist networks are only shown in the orange network, and we don't show nomenclature either, which would have the prefix spi1. As a suffix, all of them will have the name of the specialty. For example, we may have sp.2.3.farming, which is the 2.3 node of the farming network. Or sps.3.2.biology, which is the 3.2 station of the biology network. And so on. Notice how there is a specialist at each station at a given visited branch. And notice as well how the visits jump from one branch to the next in a counterclockwise angular fashion. Depending on how many members the network has, it has a greater or lower degree, which just indicates the main layer at which it attaches.

choice and being open source, provides a simple way of sending and receiving encrypted emails in a clear interface without having to worry about these issues. Once inside the network we will try to develop and enhance better ways of communication, for example i2p [65], GNUnet [73], Freenet [74], Bitmessage [75] ... so programmers are more than welcome at the first stages.

- Write an email to r0oT@tutanota.com (notice the number 0 followed by the letter o) or to any other entry email available. Briefly explain, in simple English, your motivations to enter, without revealing any personal information. You can also explain how could you help at the first stage of r0oT, which is growth.

- It is better not to attach any document, but if you do, pass it through the MAT [76] software before sharing it. It helps to clear the meta-data in it, which could expose your identity.

- In the email, show your preference between joining the main r0oT and joining the immunity i1 network. Remember, if you consider yourself a Gaia warrior, choose to enter i1.

- If you are already in the network and this is your second joining email in order to join a specialist network, use a different nick and address from the one you use at the main network, and tell us your main specialty, and whether you want to be in the specialty network or in its associated immunity network. Choose the later if you feel especially concerned about the corruption in science or in other technical areas.

- Wait for a reply. If it does not arrive after a week, try to find other entry addresses.

- Once you enter, you will receive further instructions. Basically, you will go to a brief apprenticeship stage of some weeks to familiarize with the details of the system. Try to keep yourself active or reconsider your participation. An inactive member block and harms the whole process.

- If you happen to log in into your account from another browser different than Tor, do not use it again for r0oT. Open a new one and inform your station.

- Don't use institutional computers (administration, universities, etc), or other computers from your work. Avoid connecting at places with high surveillance.

- Don't use your mobile or cell phone for r0oT.

- After you enter, try to divulge this project and open entry door addresses, without revealing your nicks in r0oT.

If you have a more technical profile you may want to set up an i2p [65] service and contact us through bote email at our i2p address [1] or at other addresses that we can provide in the future. The i2p network is, in theory, ideal for r0oT and we will try to promote and improve it, but from the inside, as it is not trivial to set it up. If the main entry emails that we provide are closed or compromised and you find yourself in the need for looking somewhere else to enter, how can you be sure that you enter the authentic r0oT network and not into another one which could be formed by malicious people with suspicious interests, or simply for trolling? We think the answer is quite simple: there is no perfect way to give an authenticity signature of r0oT while keeping it anonymous. Instead, follow your instinct. If there is someone caring for Gaia and humanity as a whole, she/he will not begin another parallel network because having 2 copies of r0oT will only increase the disorder we already have. If someone asks or offers you money or other material profit, or see ads, you are in the wrong network. If you find that the informaction flowing there is suspicious, report it to your corresponding i1 member, and if immediate action is not taken against this, exit the network. If there is no activity, you are in the wrong network. If you find a self-called 'r0oT project' or similar trying to put a server in r0oT, a kind of 'facer0oT', where you log in and have all the mechanisms in an integrated web page, don't join, or exit if you are already in, because with a global server we would not be true peer-to-peer (P2P) and our vulnerability would increase dramatically. Indeed, it would be more comfortable to have a system in which all the details would be automatic, but this would mean to put r0oT in hands of the current powers. By staying low-tech and P2P we will be much difficult to track and control. Maybe in some future we can design a custom, serverless network, to adapt to the needs of r0oT, but for now we will stick to simple emails, and wherever there is no Internet available, by direct contact or simple mail. Unfortunately, right now is not possible to join the first stage of r0oT without Internet and an email account. But at least, sticking to simple emails we will reach much further than with other high-tech approaches.

A final word: many people will criticize r0oT for being a utopia. But think about this term, 'utopia', how it is in fact a meme whose mission is to discourage everyone from taking action to change the world. It is true that this system has some complicated features, but this is nothing compared to the much greater sophistication of, for example, building a big airplane, or manage all the airports details and the air traffic. And no one think that as a utopia because you can see how is perfectly working at every city with clock precision. Why, then, should we allow the meme 'utopia' to manipulate our minds and behavior, to freeze us in front of the enormous need to action, as toxoplasmosis do to mice? [77] Come on, we can do better than that. Don't turn a blind eye to this, and don't expect others to save the world for you. Get your feet wet or they will end up drown. Join r0oT. Now.

————————————

The r0oT project is dedicated to the memory of my best friend, Raquel. We used to walk for hours while planning how to change the world. She would have been the first to join.

References

[1] I am a postdoctoral researcher in theoretical physics. My address is `al-al@tutanota.com`. Tu join, contact to: `r0oT@tutanota.com` or to `join.r0oT@tutanota.com` Permalinks to this manifest can be found at `http://aleix.lawebdefisica.com/r0oT`

[2] Oxfam, *Richest 1% will own more than all the rest by 2016* `http://oxf.am/Zi4L`

[3] NASA: *Climate Change and Global Warming*, `http://climate.nasa.gov`

[4] Ravallion, Martin. *How Long Will It Take 2526 to Lift One Billion People Out of Poverty?*, Policy Research Working Paper, 6325, The World Bank, (2013).

[5] Tudge, Colin. *Why Genes are Not Selfish and People are Nice: A Challenge to the Dangerous Ideas that Dominate Our Lives.* Floris Books, (2013).

[6] America's Climate Choices: *Panel on Advancing the Science of Climate Change*, National Research Council. Advancing the Science of Climate Change. Washington, D.C.: The National Academies Press. ISBN 0-309-14588-0 (2010).

[7] Stephen Emmott and Peter Webber, *Ten Billion*, `http://www.tenbillionmovie.com`, Oxford Film & Television, 2015.

[8] Fisher Stevens and Mark Monroe *Before the flood*, National Geographic, 2016.

[9] Kip Andersen, and Keegan Kuhn. *Cowspiracy: The Sustainability Secret.* AUM Films & first spark media. 2014, `http://www.cowspiracy.com`

[10] Morgan, Andrew. *The True Cost.* Life Is My Movie Entertainment, 2015. `http://truecostmovie.com`

[11] *Adoption of the Paris Agreement*, United Nations, FCCC/CP/2015/L.9/Rev.1, 12 December 2015, `http://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf`

[12] Rogelj, Joeri, et al. *Paris Agreement climate proposals need a boost to keep warming well below 2 C.* Nature 534.7609 (2016): 631-639.

[13] Goodland, R. and Anhang, J. *Livestock and climate change: What if the key actors in climate change are... cows, pigs, and chickens?. Livestock and climate change: what if the key actors in climate change are... cows, pigs, and chickens?*, Worldwatch Institute, 2009. `http://www.worldwatch.org/files/pdf/Livestock%20and%20Climate%20Change.pdf`

[14] Herrero, M., Gerber, P., Vellinga, T., Garnett, T., Leip, A., Opio, C., ... and Montgomery, H. *Livestock and greenhouse gas emissions: The importance of getting the numbers right.* Animal Feed Science and Technology, 166, 779-782, 2011.

[15] Planque, B., Fromentin, J. M., Cury, P., Drinkwater, K. F., Jennings, S., Perry, R. I. and Kifani, S. *How does fishing alter marine populations and ecosystems sensitivity to climate?.* Journal of Marine Systems, 79(3), 403-417, 2010.

[16] Van Dam, R. M., Willett, W. C., Rimm, E. B., Stampfer, M. J. and Hu, F. B. *Dietary fat and meat intake in relation to risk of type 2 diabetes in men.* Diabetes care, 25(3), 417-424, 2002.

[17] Key, T. and Davey, G. *Prevalence of obesity is low in people who do not eat meat.* BMJ: British Medical Journal, 313(7060), 816, 1996.

[18] Wang, Y. and Beydoun, M. A. *Meat consumption is associated with obesity and central obesity among US adults.* International Journal of Obesity, 33(6), 621-628, 2009.

[19] Lovelock, J. *The Vanishing Face of Gaia. A Last Warning.*, Penguin Books, 2009.

[20] Bianconi, Eva, et al. *An estimation of the number of cells in the human body.* Annals of human biology 40.6 463-471, 2013.

[21] Dawkins, Richard. *The selfish gene.* Oxford university press, 2016.

[22] Alberts, Bruce, et al. *Molecular Biology of the Cell* Trends in Biochemical Sciences 20.5 (1995): 210-210.

[23] Saladin, Kenneth S. *Anatomy & Physiology: the Unity of Form and Function.* New York, NY: McGraw-Hill, 2007.

[24] Wikipedia, *Pyramid scheme*, `https://en.wikipedia.org/wiki/Pyramid_scheme`

[25] `https://en.wikipedia.org/wiki/Factorial`

[26] `https://deaddrops.com`

[27] Strogatz, S. H. and Mirollo, R. E. Phase-locking and critical phenomena in lattices of coupled nonlinear oscillators with random intrinsic frequencies. Physica D: Nonlinear Phenomena, 31(2), 143-168, 1988.

[28] Digital and physical security for people. `http://www.secfirst.org`

[29] Global Witness: *2015 sees unprecedented killings of environmental activists*, Press release / June 20, 2016. `https://www.globalwitness.org/en/press-releases/2015-sees-unprecedented-killings-environmental-activists`

[30] sourcewatch: *Environmental and animal activists injured or killed* `http://www.sourcewatch.org/index.php/Environmental_and_animal_activists_injured_or_killed`

[31] Dawkins, Richard. *The extended phenotype: the long reach of the gene.* Oxford Paperbacks, 1999.

[32] Lovelock, James, and James E. Lovelock. *Gaia: A new look at life on earth.* Oxford Paperbacks, 2000.

[33] Lovelock, James. *The revenge of gaia: earth's climate crisis & the fate of humanity.* Basic Books, 2007.

[34] Lenton, Timothy M. *Gaia and natural selection.* Nature 394.6692 (1998): 439-447.

[35] Ruiz-Mirazo, Kepa, Juli Peretó, and Alvaro Moreno. *A universal definition of life: autonomy and open-ended evolution.* Origins of Life and Evolution of the Biosphere 34.3 (2004): 323-346.

[36] Kasabov, N. K. *Evolving fuzzy neural networks: theory and applications for on-line adaptive prediction, decision making and control.* Aust. J. Intell. Inf. Process. Syst. (Australia) 5.3 (1998): 154-160.

[37] Franklin, Stan, and Art Graesser. *Is it an Agent, or just a Program?: A Taxonomy for Autonomous Agents.* International Workshop on Agent Theories, Architectures, and Languages. Springer Berlin Heidelberg, 1996.

[38] Savater, F. *La tarea del héroe*, Ediciones Destino, Ed. (1992).

[39] Joseph, Peter. *Zeitgeist: The Movie* (2007).

[40] Craig, W. J. and Mangels, A. R.*Position of the American Dietetic Association: vegetarian diets.* Journal of the American Dietetic Association, 109(7), 1266-1282, 2009.

[41] American Dietetic Association. *Position of the American Dietetic Association and Dietitians of Canada: vegetarian diets.* Journal of the Academy of Nutrition and Dietetics, 103(6), 748, 2003.

[42] Appleby, P. N., Thorogood, M., Mann, J. I. and Key, T. J. *The Oxford vegetarian study: an overview.* The American journal of clinical nutrition, 70(3), 525s-531s, 1999.

[43] Le, L. T. and Sabaté, J.*Beyond meatless, the health effects of vegan diets: findings from the Adventist cohorts.* Nutrients, 6(6), 2131-2147, 2014.

[44] Mishra, S., Xu, J., Agarwal, U., Gonzales, J., Levin, S. and Barnard, N. D. *A multicenter randomized controlled trial of a plant-based nutrition program to reduce body weight and cardiovascular risk in the corporate setting: the GEICO study.* European journal of clinical nutrition, 67(7), 718-724, 2013.

[45] Null, G., Pennesi, L. and Feldman, M. *Nutrition and Lifestyle Intervention on Mood and Neurological Disorders.* Journal of evidence-based complementary and alternative medicine, 2156587216637539, 2016.

[46] Kuchta, A., Lebiedzinska, A., Kreft, E., Czaja, J., Kozlowska, A., Fijalkowski, M.,. . . and Wróblewska, M. *Impact of plant-based diet on lipid risk factors for atherosclerosis.* Atherosclerosis, 235(2), e208-e209, 2014.

[47] Elshorbagy, A., Jernerén, F., Basta, M., Basta, C., Turner, C., Khaled, M. and Refsum, H. *Amino acid changes during transition to a vegan diet supplemented with fish in healthy humans.* European Journal of Nutrition, 1-10, 2016.

[48] Tonstad, S., Stewart, K., Oda, K., Batech, M., Herring, R. P. and Fraser, G. E. *Vegetarian diets and incidence of diabetes in the Adventist Health Study-2.* Nutrition, Metabolism and Cardiovascular Diseases, 23(4), 292-299, 2013.

[49] Orlich, M. J., Singh, P. N., Sabaté, J., Jaceldo-Siegl, K., Fan, J., Knutsen, S., . . . and Fraser, G. E. *Vegetarian dietary patterns and mortality in Adventist Health Study 2.* JAMA internal medicine, 173(13), 1230-1238, 2013.

[50] Kim, M. K., Cho, S. W. and Park, Y. K. *Long-term vegetarians have low oxidative stress, body fat, and cholesterol levels.* Nutrition research and practice, 6(2), 155-161, 2012.

[51] Dinu, M., Abbate, R., Gensini, G. F., Casini, A. and Sofi, F. *Vegetarian, vegan diets and multiple health outcomes: a systematic review with meta-analysis of observational studies.* Critical reviews in food science and nutrition, (just-accepted), 00-00, 2016.

[52] Nieman, D. C. *Physical fitness and vegetarian diets: is there a relation?* The American journal of clinical nutrition, 70(3), 570s-575s, 1999.

[53] Wirnitzer, K. C. and Kornexl, E. *Energy and macronutrient intake of a female vegan cyclist during an 8-day mountain bike stage race.* Proceedings (Baylor University. Medical Center), 27(1), 42, 2014.

[54] Barr, S. I. and Rideout, C. A. *Nutritional considerations for vegetarian athletes.* Nutrition, 20(7), 696-703, 2004.

[55] Fuhrman, J. and Ferreri, D. M. *Fueling the vegetarian (vegan) athlete. Current Sports Medicine Reports*, 9(4), 233-241, 2010.

[56] Leischik, R. and Spelsberg, N. *Vegan triple-ironman (raw vegetables/fruits).* Case reports in cardiology, 2014.

[57] *Great Vegan Athletes* http://www.greatveganathletes.com.

[58] Speech by Gary Yourofsky, https://youtu.be/es6U00LMmC4.

[59] *Laureates Letter Supporting Precision Agriculture (GMOs)* http://supportprecisionagriculture.org/nobel-laureate-gmo-letter_rjr.html

[60] Global Climate Scam, http://www.globalclimatescam.com

[61] Wikipedia, *Global warming conspiracy theory*, https://en.wikipedia.org/wiki/Global_warming_conspiracy_theory

[62] Hartmann, D. L., Klein Tank, A. M., Rusticucci, M., Alexander, L. V., Brönnimann, S., Charabi, Y. A. R., . . . and Soden, B. J. *Observations.* In Cambridge University Press, January 2013.

[63] Krüger, O. and Davies, N. B. *The evolution of cuckoo parasitism: a comparative analysis.* Proceedings of the Royal Society of London B: Biological Sciences, 269(1489), 375-381, 2002.

[64] Tutanota, https://tutanota.com

[65] i2p, https://geti2p.net

[66] Tudge, Colin. *When do scholars become advocates?*, http://www.campaignforrealfarming.org/2014/08/when-do-scholars-become-advocates

[67] Tudge, Colin. *The world's agriculture wrong ideas,wrong intentions and the wrong people in charge.*, http://www.campaignforrealfarming.org/2016/10/the-worlds-agriculture-wrong-ideas-wrong-intentions-and-the-wrong-people-in-charge

[68] Tudge, C. Good food for everyone forever. Pari Publishing, 2011. /

[69] White House: *Increasing Access to the Results of Federally Funded Scientific Research*, February 22, 2013. https://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf

[70] Tor, https://torproject.org

[71] Tails, https://tails.boum.org

[72] Wikipedia, *Internet censorship and surveillance by country*, https://en.wikipedia.org/wiki/Internet_censorship_and_surveillance_by_country

[73] GNUnet, gnunet.org

[74] Freenet, freenetproject.org

[75] Bitmessage, bitmessage.org

[76] MAT, https://mat.boum.org

[77] Skallova, A., Kodym, P., Frynta, D. and Flegr, J. *The role of dopamine in Toxoplasma-induced behavioural alterations in mice: an ethological and ethopharmacological study.* Parasitology, 133(05), 525-535, 2006.