

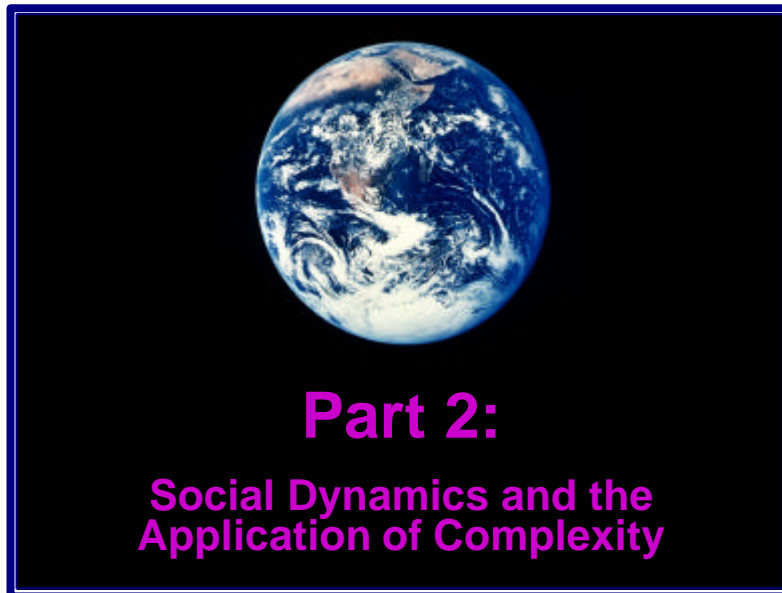
LSE Complexity Research Seminar

28th January 2010

Complex Solutions for Complex Problems: Mobilising Social Response to Accelerating Climate Change In a Post-Copenhagen Context

Convened and chaired by Professor Eve Mitleton-Kelly

Presenter: David Wasdell



Abstract for Part 2:

The second part of the seminar focuses on the dynamics of social systems in response to the climate crisis. The escalating rigidity and complexity of command and control structures reduce the resilience of the social system. The institutions of international negotiation become dysfunctional as a means of mobilising effective global problem-solving. The dominance of powerful vested interests in the politico-economic arena constitutes a virtual veto on essential action, reinforced by the psychodynamics of resistance to change in conditions of rising social anxiety.

The insights of complexity science may offer an alternative approach, mobilising the deconstruction of the command and control dynamics and catalysing the emergence of a zone of contained turbulence (the 'chaotic' state) in social behaviour. Connectivity, self-organisation, multiple parallel processing and the emergent properties of a metamorphic transformation of global dynamics, could generate response that is able to get ahead of the curve of the developing crisis. The precipitation of the required phase-change in social dynamics from the rigid, slow response characteristics of the solid state, to the resilient flexibility of a liquid phase may constitute the best hope of achieving a sustainable form of human civilisation within the definitive constraints of the planetary environment.

Presentation by David Wasdell

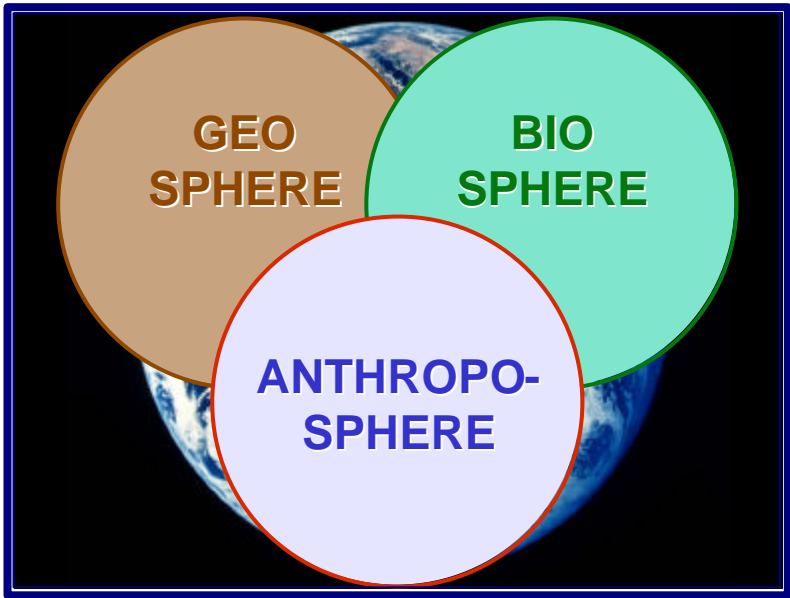
Part Two - you have the abstract – looking at the dynamics of social systems as they respond in the situation, actually not very good. The escalating rigidity, the complexity of command and control, and all the factors that grab it, lock it. A colleague in Brussels who talked about his experience, started off with Kurt Lewin's force-field analysis. Forces moving the situation in one direction, forces blocking it from the other, and the balanced feedbacks between them, that leave you 'walking the corridors of impotence' while everybody else sees you walking the corridors of power. After Copenhagen I met with Colin Challen, the Chair of the All Party Parliamentary Climate Change Group, in the corridors of Westminster. He said 'this place is insane' and he just shared that it is so hard even to hang on to your own sanity in the maelstrom of conflicting interests that block anything from happening at all, and that is success for the Empire of vested interests.

Institutions of international negotiation are dysfunctional as a means of mobilising effective global problem-solving. Can you really take the seriousness of that on board? Dominance of powerful vested interests in the politico-economic, military-industrial economies constitutes a virtual veto on essential action in terms of engaging with the fundamental problem. What they are vetoing is action that threatens their own life-support system in their economic, power and wealth-generating domain. There is a war of the worlds going on. It is way beyond the naivety with which many of us as campaigners approached Copenhagen. And as we have already been beginning to see, the psychodynamics of resistance to change, the anxieties that are mobilised, the flight patterns, the denials, the dissociative behaviours, all militate against effective action. Our resilience as a civilization decreases in the face of impending crisis, when it needs to increase in order to stay in touch with reality and solve the problem.

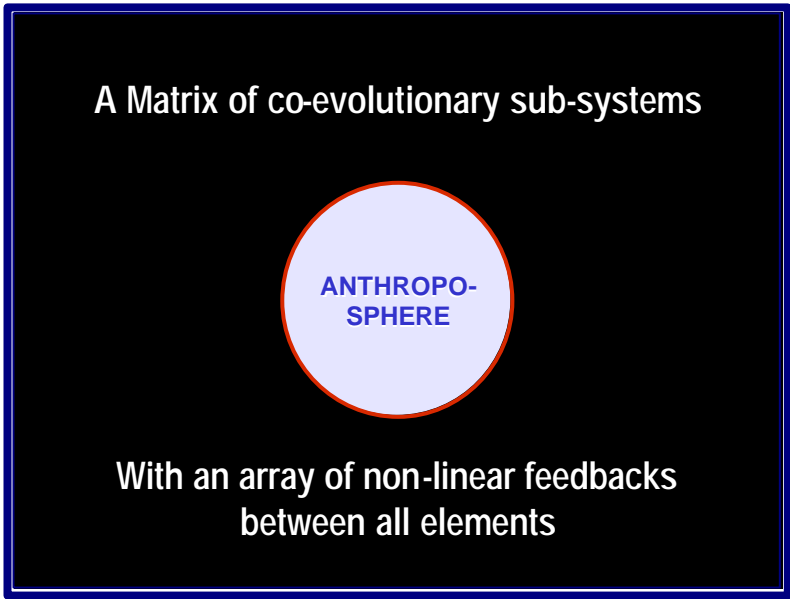
Now, this is why 5 or 6 years ago I moved on from my life's work on the dynamics of change in social systems, large and small, under conditions of high stress, rapid change, and decreasing resource, where these behaviours come out in all their viciousness in the harsh reality of now. I began to engage the reality of the context of the planetary life-support system and the necessity to intervene in order to generate a path of survival, within which we can continue to develop. It is not just for my children and my grandchildren, who do exist, but unto generations of generations of generations. We are only at a tiny fraction of what the human species might be and become, and you want to abort it now, because you are making a fast buck? My Hebrew will come out 'le-ha'im', unto life, that is my dedication. Now there I think we have some motivation that is a win/win/win across all of human being at this point in the crisis of civilization.



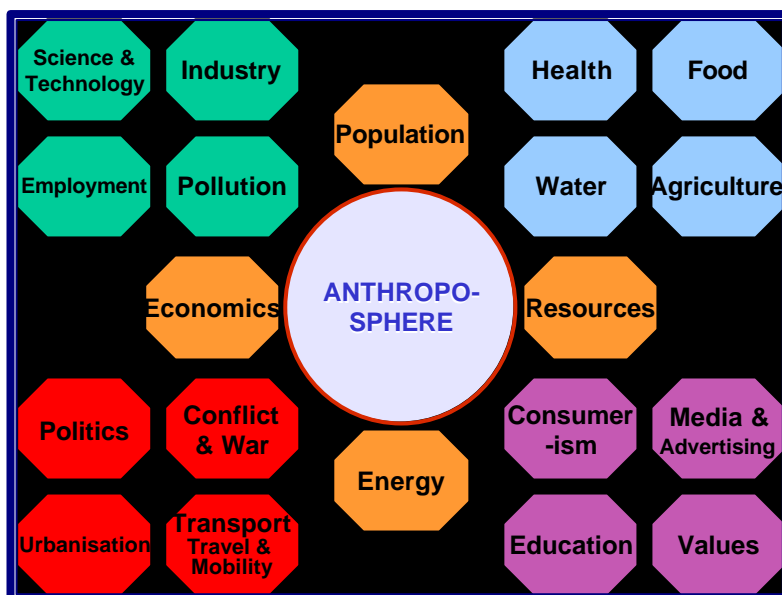
Gaia – the whole earth system. I was calling it the whole earth system until Jim Lovelock grabbed me at lunch and said ‘why don’t you use the word Gaia – it’s my invention, it is absolutely appalling that you don’t use the word Gaia and if I don’t challenge you my wife will take me to the cleaners after lunch’. So I said ‘OK Jim you have got a problem with your wife’! When he started using the word Gaia it was targeted with all sorts of New Age fancy projection, and he still gets statues of the Earth Goddess in the post. But for him this is a profoundly scientific concept of a very, very complex self-managing, autopoietic self-organising set of webs of complexity systems of complexity systems of complexity systems, that has an extraordinary capacity for self-management. Not at a conscious level but just because that is the way the systems work. And I said OK.



Gaia consists of three fundamental systems: the Geo-sphere – the physical chemical structures of the earth; the Bio-sphere – life, very much confined to a tiny little layer around the outside; and of that a sub-structure that has now become a dominant structure: the Anthroposphere – the human structure. It is to the Anthroposphere that we are going to direct our attention in this second part.

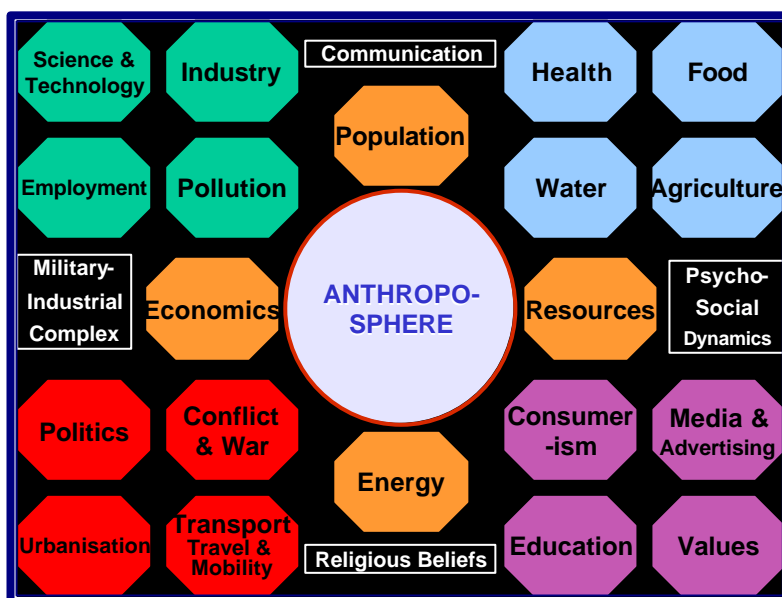


The Anthroposphere is a matrix of co-evolutionary sub-systems with an array of non-linear feedbacks between all elements. So how do you get a command and control structure to make that work quickly in a crisis?



What is involved in this? Well, population, energy - you have seen a bit of those already – economics, resources, science, technology, industry, employment – the output, the entropy, the pollution structures, health, food and water – the means of survival. They broke down in Haiti, agriculture – that wasn't there because they had deforested and broken down their life support system.

Politics, conflict, now then we are getting into some heavy stuff aren't we? War, transport, travel and mobility. Huge vested interests in those areas aren't there? Consumerism, media, values, education, and all of these framed by the web of global communications and the military-industrial complex which has been built up over generations.



I was sitting next to a general in the NATO headquarters for future planning in the States some time ago at a Club of Rome Gala Dinner. They put a general on everybody's table, I suppose to keep us all in order. And I turned to him and I said 'How would you propose to make war with no fossil energy?' He never did answer me!

Religious beliefs become fundamentalist, exclusive, massively enforced during periods of rising anxiety. In fact, if you do a study of religious revival movements across the world, you see that they break out just before major systems go into breakdown. The religious system acts as forewarning – the canary in the

coal mine – of social cataclysm, social disruption. Our anxieties go up and we need more certainty. Fundamentalism and religious revival movements provide it. And it is happening, of course, around the world.

Psycho-social dynamics – the unconscious of the process. And if I ask you the kind of question that nobody can answer ‘What are you really unconscious of?’ and then you begin to recognise that it is probably what you are unconscious of that drives the process that underlies the matrix of the complexity net of complexity systems that makes the Anthroposphere not behave effectively.

**Worst Case Scenario
Is entered by passing**

The Point of No Return:
the Critical Threshold
at the
Convergence of Complex Systems.

OK let's move on. I was asked to do a keynote for the Worst Case Scenario workshop for the Foundation for the Future in Seattle. Timing was early September 2008.

**Worst Case Scenario
Is accelerated by:**
Collapse of Resilience
Economic implosion



The Worst Case Scenario is accelerated by the collapse of resilience. We buy political power by decreasing resilience in the system. Economic implosion is the point at which the value of the wealth to solve the problem starts to go down the whatever, then we have less resources to engage. Then, blow me, if 2 weeks later Fanny Mae and Freddie Mac all started going the vortex and the Economist asks ‘What Next?’ Well what next was immense release of financial resources to plug the vortex temporarily, but in so doing decrease the resilience of the economic system and escalate the likelihood of further collapse happening. We are just now getting warnings through from key analysts about where this is likely to go next. Now I am not an economist, and I am not going to venture further down into that vortex but the analysts that I am listening to are making it very clear that the slight hold in the economic implosion is not likely to be sustained. The drivers of it have to do with our input of wealth, which has to do with our use of energy and that is now a critical issue for the future security of our global economy. Maintaining exponential growth in the economy as a condition of political stability and social management, may not be a sustainable strategy. Did you see the New Economics Foundation report just released 2 days ago?

Worst Case Scenario

Is accelerated by:

Collapse of Resilience

Economic implosion

Climate impacts

Resource deprivation

Breakdown of health

Global psychosis

OK I don't want to leave the vortex up there. Climate impacts, we have done enough on that. Resource deprivation. We are of course using more than 1 planet's worth of resources per year and the amount of the 'more' is increasing per year, so we are actually cashing in capital resources on an increasing basis. The more capital we cash in to meet our current account demands, the less basic structures there are to provide the harvest for next year, so the more we have to use of the capital, and that is one of those curves that goes into an exponential collapse. Try talking with Mathis Wackernagel and William Rees of the Footprint Network about the potential of where this is going.

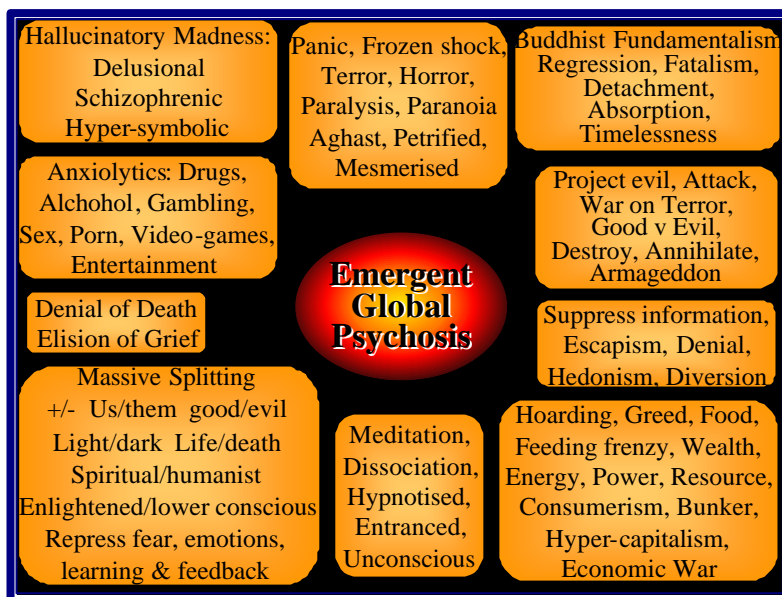
The breakdown of health. What happens if? What happens if? If SARS had not been contained? If Swine flu was much more lethal? If the American molecular researchers and biological chemists manage to make Ebola not droplet borne but airborne and survive, as they are attempting to do? Some years ago, I was working as a consultant with the World Health Organisation, and the news came through that while we were working together on trying to eradicate things like polio and malaria and so on, there was another huge amount of granting going in to making smallpox non-treatable with all modern drugs, so that it could be used as a weapon if required – not that we would ever use it! I'm sorry, I get, I do have some feelings about this – I found that obscene. Absolutely obscene.

While I was there as well, a team had been working on the effects of depleted uranium, the dust from its use in armour-piercing shells in the first Gulf War, the first Iraq War. The findings of that were showing up a high degree of associated long-term cancers. And the whole study was vetoed by the American military intelligence, the data had to be destroyed and no reports had to come out of that, otherwise America withdraws its funding for the World Health Organisation. You talk about lobbying!



**Emergent
Global
Psychosis**

The breakdown of health, and finally, the emergence of global psychosis. What do I mean? Well something like this. In response to what is going on: Panic, frozen shock, paralysis, stuck in the beams of the headlights and going rigidly immobile with terror. OK yeah we get into delusion and schizophrenia, hyper-symbolic – the whole range of schizoid and near schizophrenic behaviours begin to emerge within the collective response. Or let's turn to something else, the anxiolytics – the increased used of anxiolytics under high stress is marked, you can look at it in history.



Switch off. The denial of death and of grief. When Al Gore wrote that first book of his and he said you know ‘we have to be able to weep with the tears of grief for what we have done to the planet before we can really see clearly how to engage its reality’ or words to that effect – I think I have got it right enough. But then when he was doing some of his Inconvenient Truth presentations, he was saying we are caught between denial and despair and he does his you know ‘De Nile is a river in Egypt and De Spare is what you have in the trunk of De Car’, only our cars don’t have trunks they are not elephants. And I am saying ‘Al, OK, you try to avoid despair.’ Is there anyone here who has been through one of Johanna Macey’s Despair Empowerment workshops? There are some nods around the room. You don’t run away from despair. If you are facing a despair-generating situation you find the courage with your partners, with your fellow travellers, to look at the reality of it, to face your emotional agenda, to deal with your rage and your grief and your depression and your darkness and go through that into an engagement with the situation as it really is. Then you try to make what difference you can – that is work. And if you avoid despair (De Spare) and leave it in De Trunk you go nowhere in De Car.

I appreciate this and I engaged with Al through one of his closest friends, because he is so traumatised with the near death of his son and the actual death of his sister, so traumatised through that election hang, that there are areas of despair he cannot personally engage and I think he is holding us back because of his own personal agenda at this point. And with all the love in my heart I hope he will deal with that, because it is a point of release that will enable him to engage in a totally different way with the realities of the planet.

OK enough on Al. Denial of grief. Splitting – Us/Them; Good/Evil; Light/Darkness. Yes massive splitting comes up doesn’t it? We find enemies much more easily, I don’t need to talk any more, this is all obvious stuff. Fundamentalism, I was once attacked by a Buddhist Fundamentalist – I’d never come across a Buddhist Fundamentalist before, but he said I was totally unenlightened because I cared about the world, I should just be observing it. OK

Attack – how do you make War on Fear? Without increasing fear? Oh, by the way, the level of terror has been upped in the UK. What does that mean, we are more scared? So you can see all of these as

symptomatic of what is going on. Suppress information – that is going on isn't it? Denial, escapism, hedonism, diversion, get out of the heat.

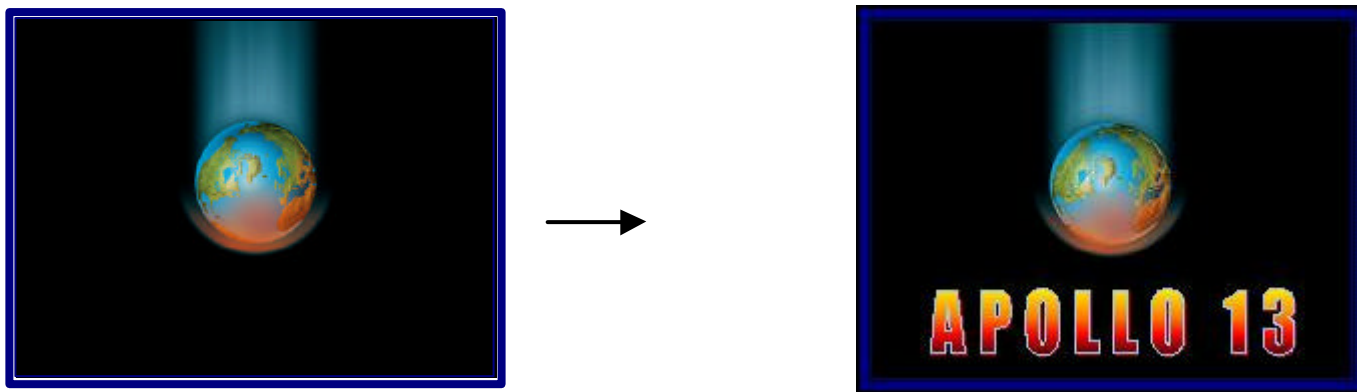
Hording, greed, food, feeding frenzy, obscene obesity and that isn't just about food and body size, it is about bank balance and wealth and stuff. And perhaps the dissociative behaviours, you know you go on the tube and you have got your headphones plugged in and you just nod away in a different world. Or you can play on the fiddle whilst Rome burns, but it comes to the same thing.



I thought this was beautiful. This was the front page of the New Scientist last June – some of you saw it. Gaia's Evil Twin, life is its own worst enemy. Beyond this extraordinary fantasy (that we have an ultimately dependable good mother earth, who is the source of all goodness, absorbs all our pollution, enables growth to go on forever, is there for us caring for us, the Great Mother) we are now beginning to find the other side of Kali. The creator is also the potential destroyer. That splits apart our defences of idealisation. Maybe we have to deal with the Earth as it really is, rather than project our infantile foetal ideas of an environment which provides all the energy we need to continue exponential growth for ever, into which we can dump our pollution and the mother system deals with it – we don't have responsibility for that – and provided you are not anywhere near birth, you can carry on growing with no constrictions. So I offer you foetal assumptions in the psychology of humanity as fatal assumptions in the civilization of humanity, in the final phase of its last doubling in a limited global environment. The placenta is beginning to come under stress and there is nowhere to be born.

**There now exists a
State of Planetary
Emergency**

There now exists a state of Planetary Emergency. Yes, I think that is pretty accurate. I said it at the Club of Rome in October 2005 and people have said it round the world ever since.



This is another one from the Economist. Now what is happening? The Earth is in free fall like an asteroid hitting into some atmosphere which is why it is heating up at the south pole. Where is it actually heating? – it is heating up in Africa and South America actually. That is where the heat is really being felt. A sort of ‘the Earth has become Apollo 13’. Planet Earth We Have A Problem, except there is no Houston doing a rescue development. We are Houston.



It is a parable for our time. A tiny spaceship with its life support system blown, having to take down its use of energy, having to reduce the concentration of carbon dioxide that is threatening the life in it, and doing its strategic re-entry trajectory without enough control to know whether they are going to make it, and still not knowing whether the heat shield has been damaged irreparably. And if they do get in, whether they are going to be burnt alive on the way through. That is about where we are at.

‘Failure is not an option!’

I think Gene Kranz was just awesome in his leadership style in Houston.

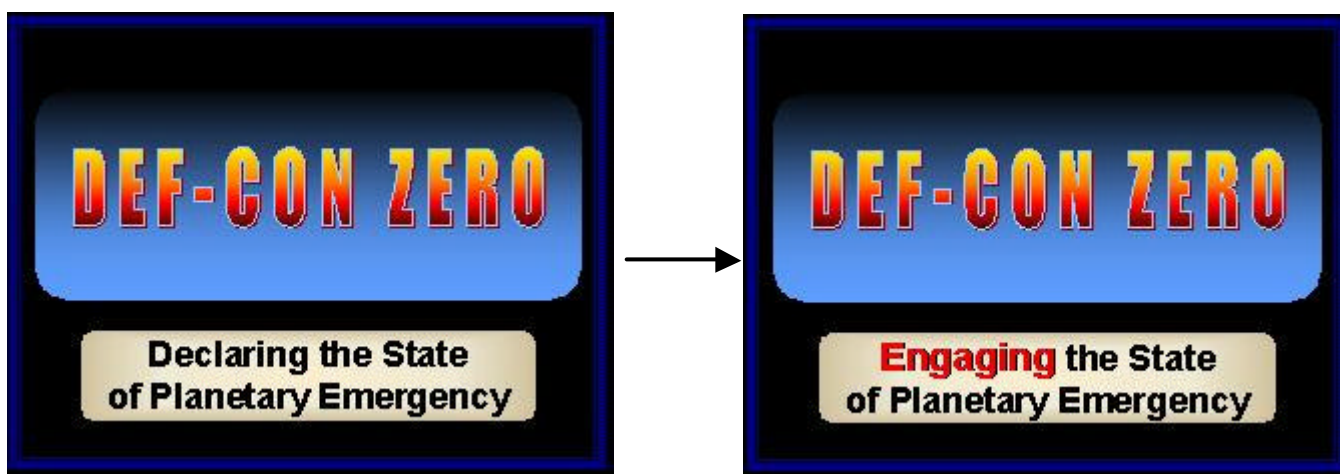


You know when the politician came in and said ‘Gene I think this is going to be the greatest disaster in the history of NASA’. Gene replied: ‘With respect sir, with hindsight I believe this will be seen to have been NASA’s finest hour’.

We won't see the answer to that in our lifetime. But maybe the great, great grandchildren will look back and say 'That was humanity's finest hour!'



We are effectively engaged in an asteroidal impact of global proportions and the asteroid is us. There are some differences. That is almost instantaneous – we have had a slow burn. The asteroid is inanimate – we are not. The asteroid does not learn, and is not a system of complexity – we are and thereby hangs the difference that enables us to engage in a way of solving the problem that has some hope, realistic hope, of making a difference within the timescale.



Yes, **declaring** the state of emergency is one thing. **Engaging** with it, now that really is work! So let's get into a working engagement rather than just making alarmist noises!

So I thought, Eve, if I could take a few minutes just to skim through some stuff here on the beginnings of a complexity approach. This is raw material, this is workshop level material. I don't think anybody has the answers here yet, and I am hopeful that out of some of our discussions and the work that goes on beyond today, we can begin to refine some of the ideas we get here.



Love this, this came out 20 years ago. A shift from organisation to organism. Shall I do that again, if I can find the reverse button. Yes, there you go. It is a chip design of course. From rigid, that is complicated, that is your blackberry, OK. This represents the kind of multi-matrix design of command and control in our political control systems that we have today.

The shift from organisation to organism. Of highly inter-connected nodal, parallel processing humanity that takes responsibility into a distributed net. That is distributed processing, distributed intelligence. It has the capacity for self-mobilised organisation, rather than giving all the authority to that which can no longer work.



Yes, that double-picture is 20-25 years old. Two years ago, a factor of 10, Yvo De Boer, the Chair of the COP13 negotiations, when he was talking to the business community in Bali, said: 'We have to turn around the super-tanker of investment'. Easy? No it is not easy! Yes we can use trim tabs on the back of the rudder, but a super-tanker is very inert, it displaces hundreds of thousands of tons, most of it is fossil energy anyway and we are going to dump it somewhere else aren't we. It is navigated by one mind up in the master's turret at the back, and he controls where it is going, directed by financial vested interests of the rest of the world.

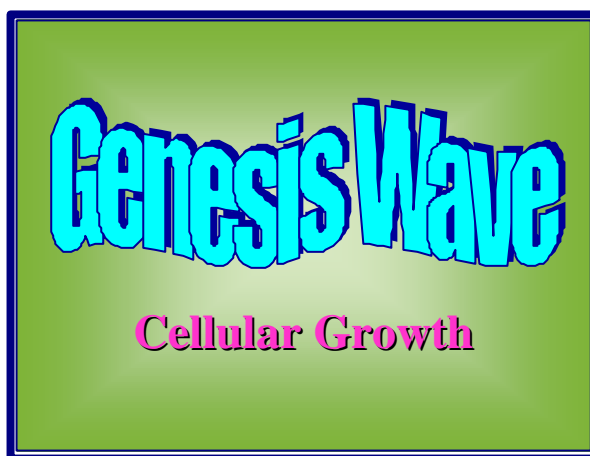
If you treat the structures of authority and decision making as a super-tanker, and you can't think outside the box of super-tanker-ism, then frankly there is no realistic hope whatsoever of making an intervention that would get to the right solution in the time-frame we have.



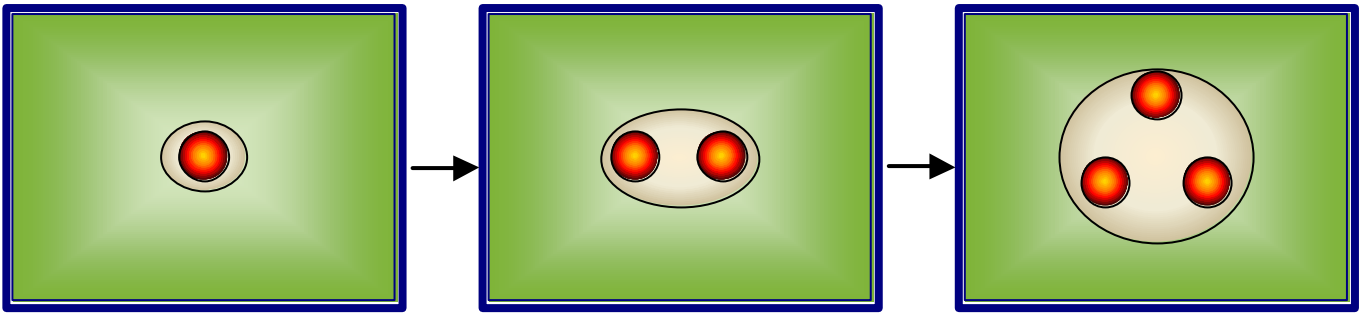
And it was at a seminar here, 18 months ago, that we re-interpreted from ‘super-tanker’ to ‘shoal’. From super-tanker to shoal. And the shoal, just watch it. A shoal does all sorts of exciting things.



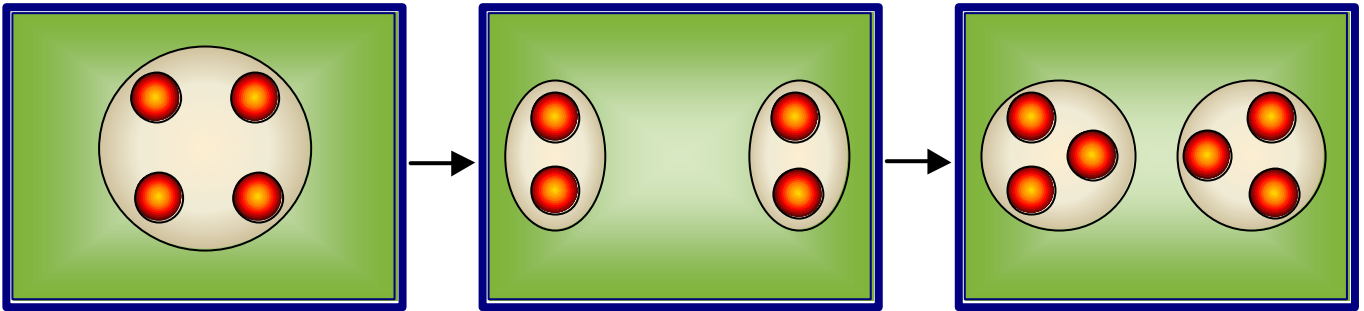
If a shark comes and attacks, the shoal moves as one, and then it relaxes back out again. It can come under attack again. It is an incredible pattern. The connectivity of each of these little organisms, with the pressure cells down its body, reflects what is going on immediately around it. There are visual signals, there are energy signals, there is all sorts of stuff going on. It moves collectively as one. It responds. It does not have a command and control structure and a central parliament that tells it what to do and how to avoid the shark. Particularly when the time-frame and the decision-making process of the central politburo is actually much slower than the speed of the shark attack. I am sorry. It would not have survived. The dinosaurs which had that kind of decision-making process don't exist anymore.



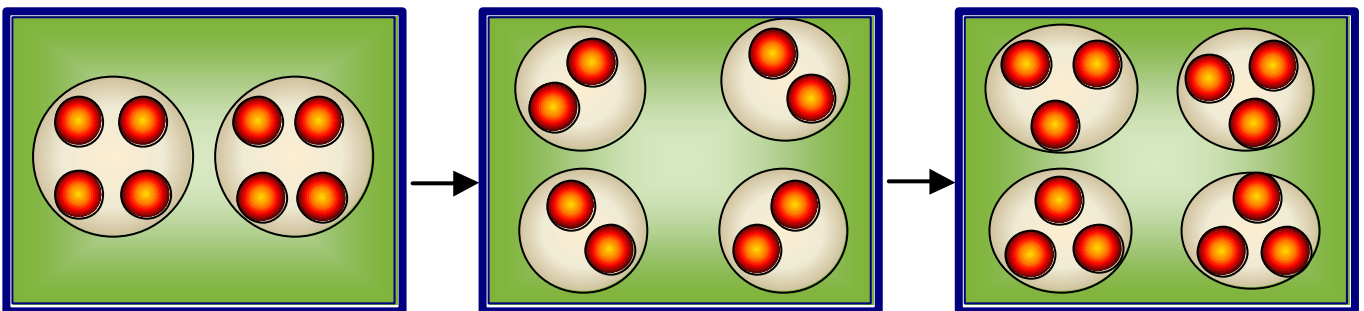
Super-tanker to shoal. What does it look like? Well, these are my first attempts at creating something of the massively parallel processing, virally replicating, cellular structures of humanity, which, with their total inter-connectivity but not over-activity, can begin to get ahead of the curve of the urgency in the fierce reality of now.



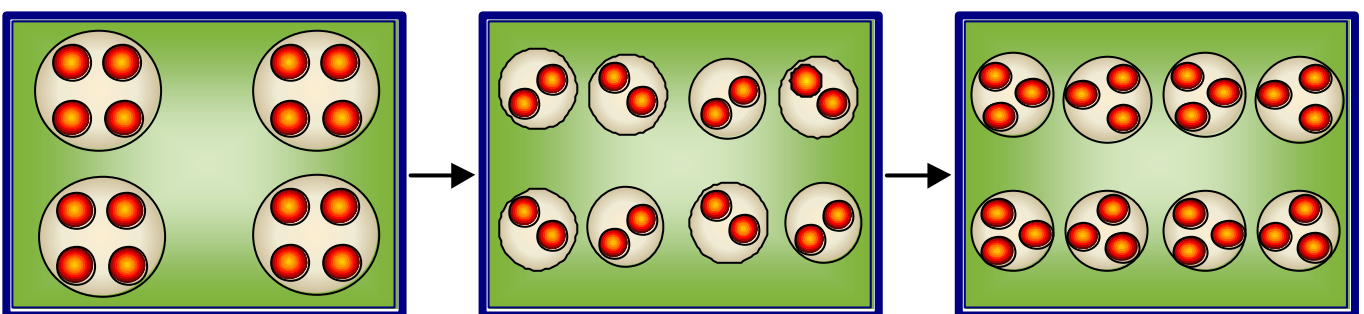
So maybe you can start with an individual and add another and another.



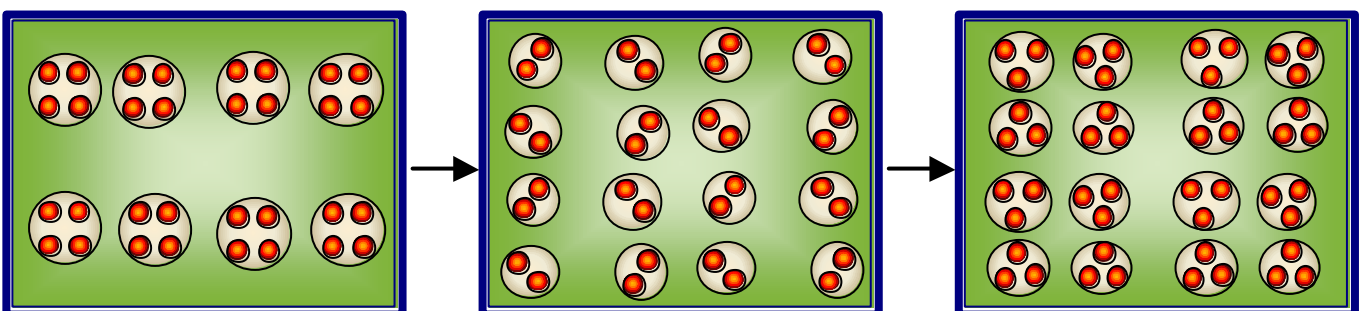
Threes are looking for another, but fours are unstable, so fours divide into for pairs. Pairs look for others.



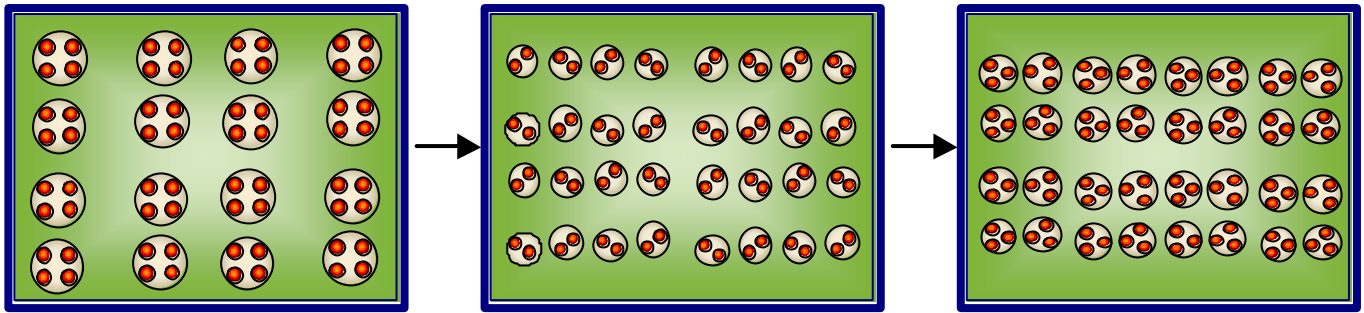
and triads can look for others, and fours are unstable, so maybe we can break into twos, and ...



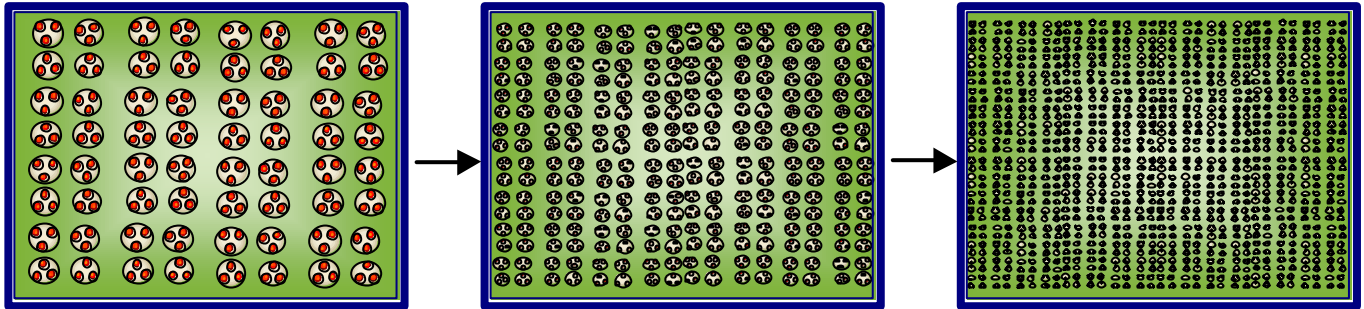
And...and...and...



And...and...and...



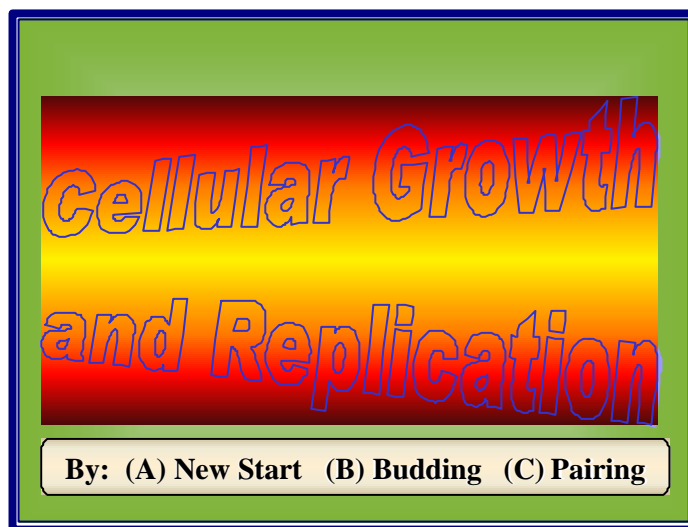
And...and...and...



And...and...and... It begins slowly and grows exponentially. I don't know how far it goes – replicating, replicating, twos, threes, fours, twos, threes, fours, twos, threes, fours and then just going on.

It is not a super-nova, it is a star birth. And they are totally different. Memories of Arie de Geus and the difference of opinion between how the Society for Organisational Learning should be launched in Europe. He said it ought to get off to a big bang like the star-death of a supernova. Eve and I said it should start with just the still small voice of star birth, the gathering under gravity and the beginnings of energising, of a complexity net that would make the difference. A big bang that levels out and plateaus does not do the job. And SOL went on its pathway and I left. You (Eve) eventually left to run with complexity issues.

Each blob could represent say 3 people, so these could be 3s, 6s, 9s, 12s, 3s, 6s, 9s, 12s and so on. The connectivity between all of these is essential. The layout of these is not just rigidly orthogonal – (I couldn't do the graphics in any other way!). The connectivity is what makes the behaviour autopoietic. The combination of connectivity and inter-activity is what begins to get the value system change, that begins to mobilise massive numbers and political lobbying and power. That says to the structures, change, engage, cut out the vested interests, go for the solution for survival.



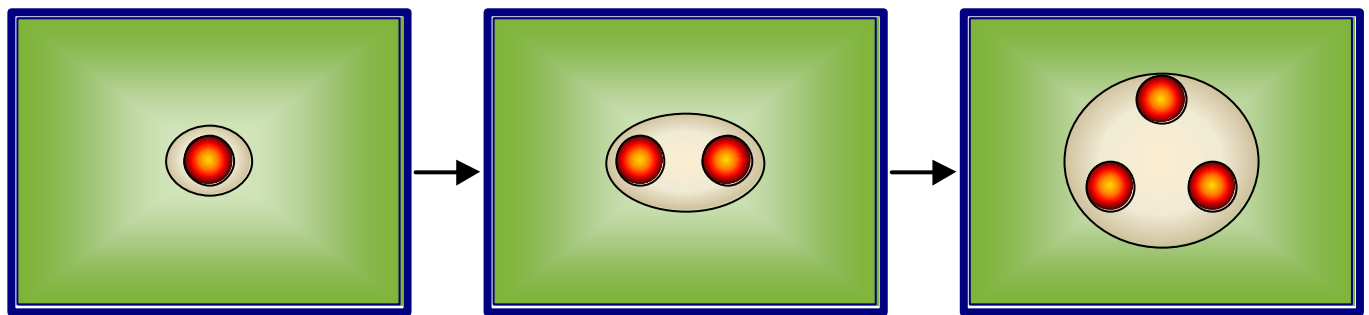
How do we do it? Well one essential is building into the structure capacities for growth and replication.

Most of our campaigning organisations work with ‘we have a network’. No they don’t have a network. And the net doesn’t work anyway. They have a group for London that meets in a pub somewhere in the north-west and is open for 8 million people, – excuse me!! So the structures for growth and replication are critical.

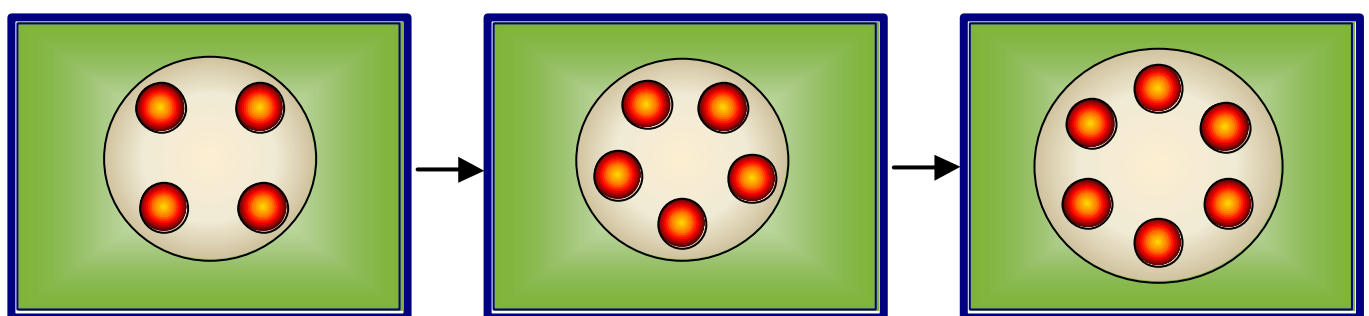
Cellular Growth and Replication

A. New Start

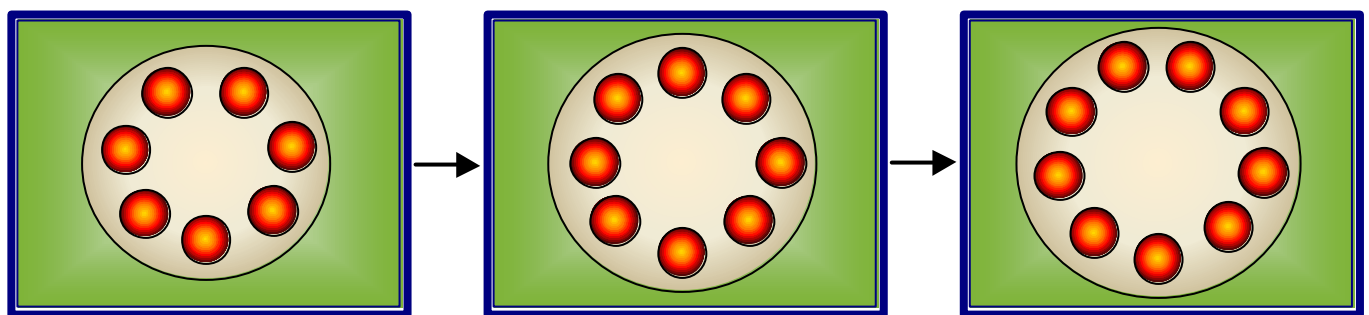
Lots of new start-ups. Yes you can start a group off from scratch.



And just go on adding...



And just go on adding...



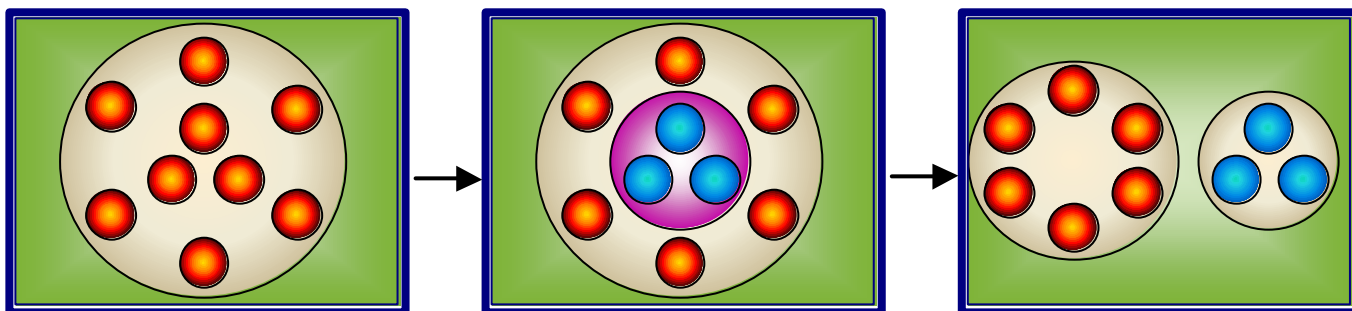
Up to the saturation-point of a primary group.

Transition Towns begins to start growing like this and gets a good group going. Then it sets up a limited set of such saturated groups, reaches a limited number of people and then stops growing. Interesting. Transition Towns has an internal structure to its engagement with an urban environment that is self-limiting and means that it does not change the environment. In a tiny village, it would be OK. In an urban environment it becomes irrelevant. Many urban environments engage, but none of them reach critical mass.

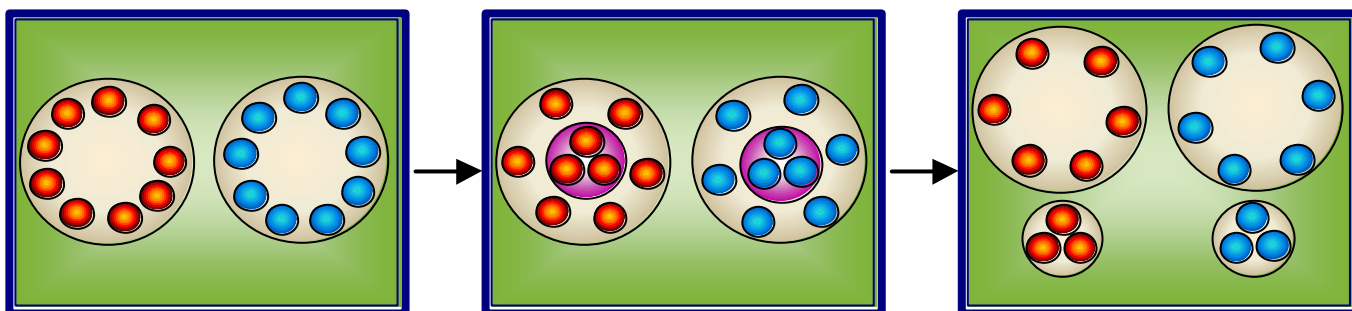
*Cellular Growth
and Replication*

B. Budding

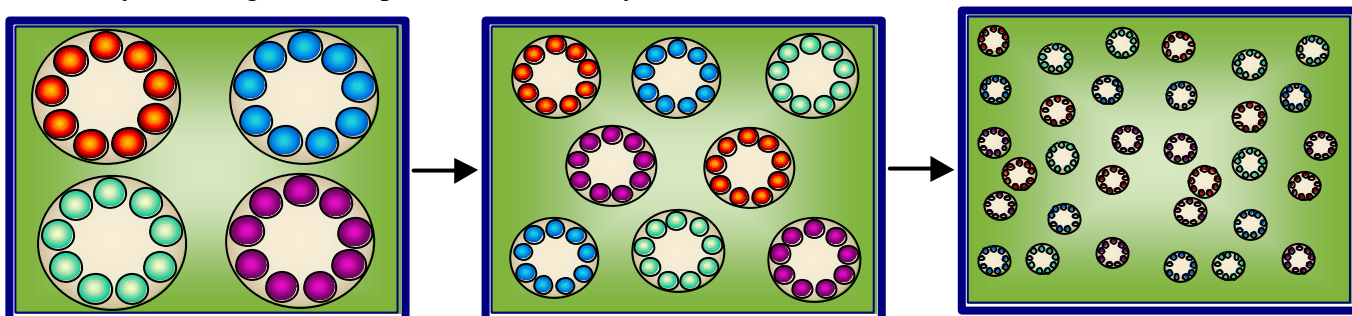
Budding, asexual reproduction.



Find 3 members within the group who have the resources and support, to launch out and start another one.



and then you have got more spaces, and then they can do the same.

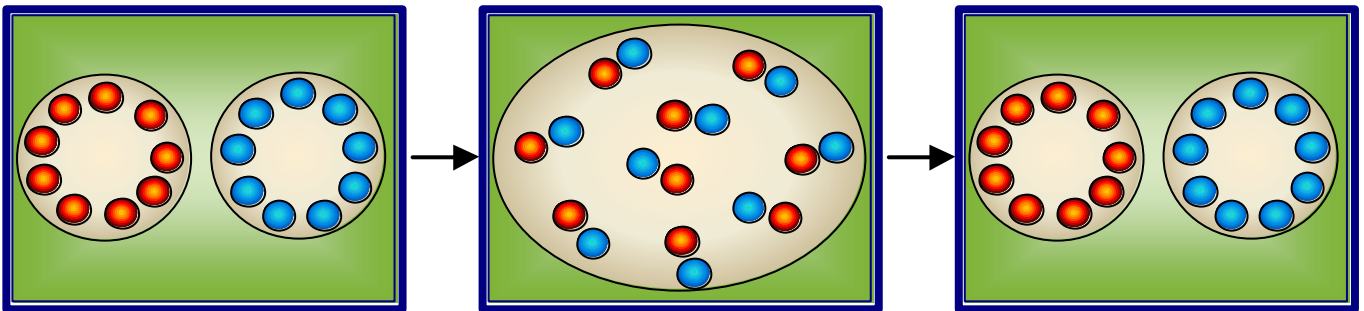


and maybe we can begin to develop family lines of parents and children, and parents and children.

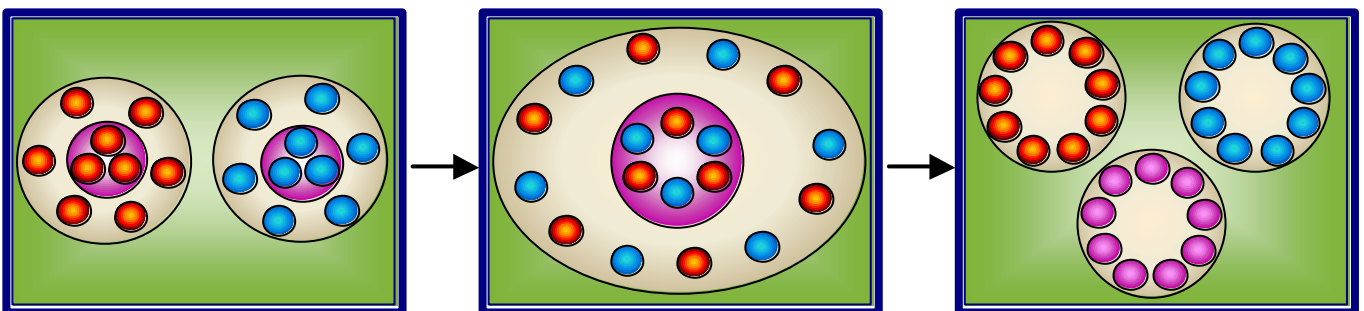
Cellular Growth and Replication

C. Pairing

Pairing – sexual reproduction is much more interesting I find.



Pairing – two mature groups will come together for a day’s workshop, one from each meets one from each, really compare, cross-fertilise, change, take your time over it and then go back and say oh my god, they have done something, we could learn from that.



Again find your core triad to make up the beginnings of a new group that will become the child of the two groups – much more learning, much faster learning. The new group is externalised and can then go through its own maturation process.

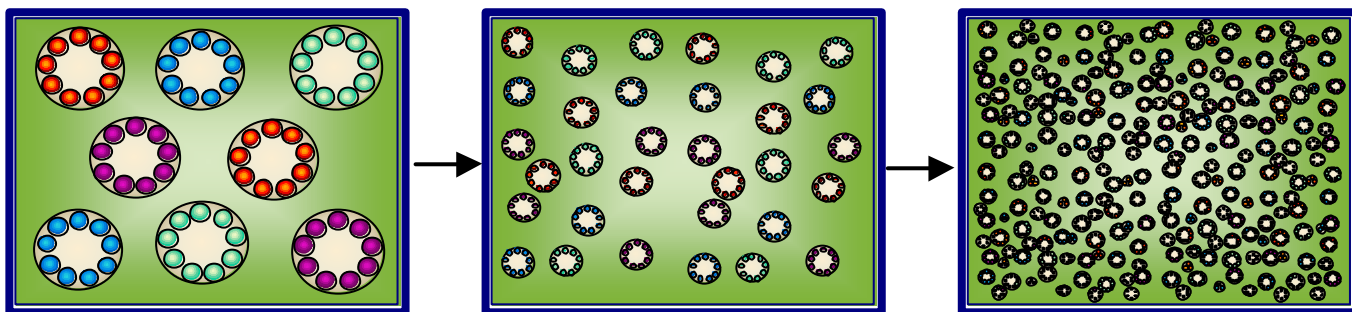
Q: I didn’t quite understand that. You are saying that within the groups we have certain little cells that then are able to multiply?

David response: You on the right are a group of a dozen people. You on the left are another group of a dozen people. You have a dynamic workshop. One from this side meets with one from that side. You look back and say ‘what have we learned, what are the problems we are struggling with, what would we like to be doing, how are we doing it best, what could cross-fertilise?’

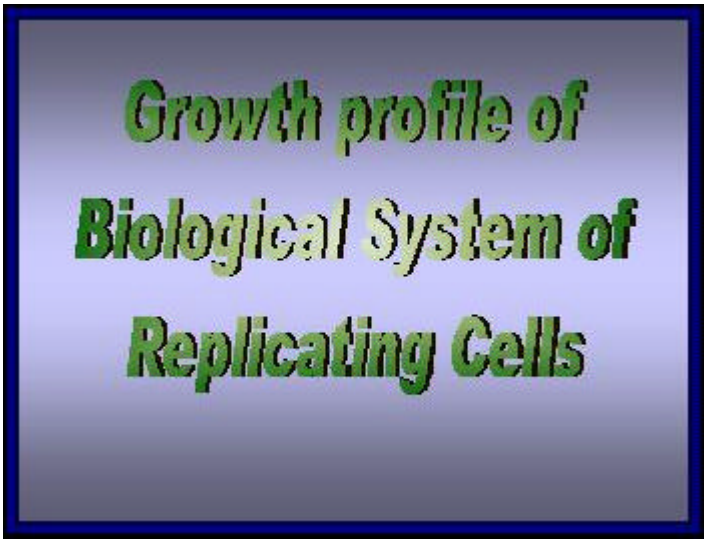
Then go back into your groups, share some of that – that is cross learning. Then you find 3 people who are willing to have a go. They will be the seed that together with the 3 from the other group, sets up the new group. You (on the right) will find your inner triad, who will meet with the inner triad (from the left) to form the core of the new group. When you have done the processing, you will stay inter-connected, you will stay in touch, of course. But it means that the group does not saturate and the new group begins to form, develop its own inner life and then go on to add new members to it. Does that make sense?

What I find is we have different ways of learning. And some of it is verbal and some of it is visual, and some of it is dynamic. I remember doing a workshop once and sent a lot of notes before it to explain exactly the process we were going to go through. Some people said ‘didn’t understand a word of that’. So next time I did a presentation like this, and one person said ‘didn’t understand that at all’. I found that the person concerned had just become engaged to a dancing instructor and lived learning. My guess is that you are more a kinesthete [Yes] – thank you. That is so important and I missed it.

The next workshop I ran, we sat on the floor and actually modelled together the process we were going to go through. He came back and said ‘got it’. And I am meeting somebody tomorrow night who is profoundly a kinesthete who I think is brilliantly intelligent, but has not been met by the educational establishment in a way that they have been able to learn. And we need all processes of learning.

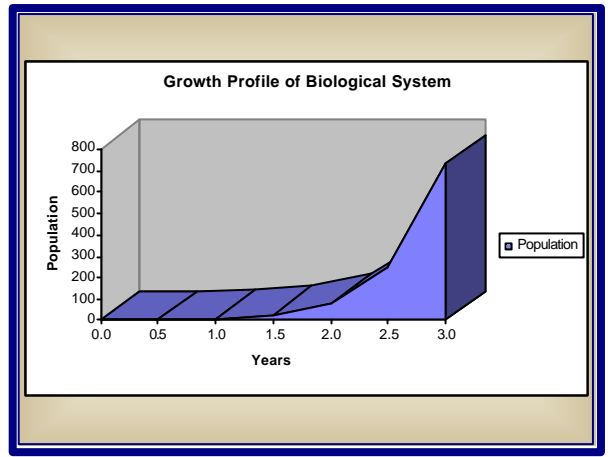


So maybe we can grow on from that and develop, family lines of parents and children and grandchildren, and great-grandchildren, and great-great-grandchildren, who all stay in touch as a family tree. Then of course we get threes and new groups and buddings and pairings all evolving together to develop this kind of network. The inter-connectivity of which allows massive growth in numbers, high inter-activity, the possibility, (once it gets to the right scale) for generating self-organising movements that take the information and start to act on it, and make it by-pass the log-jam that currently is holding us in place. This can be applied to major campaigning organisations, to structures of business, and to all sorts of other organisations. It enables them to become resilient, flexible, creative, parallel-processing, with distributed intelligence. Each cell needs to become an effective, high profile, multi-order learning organisation.

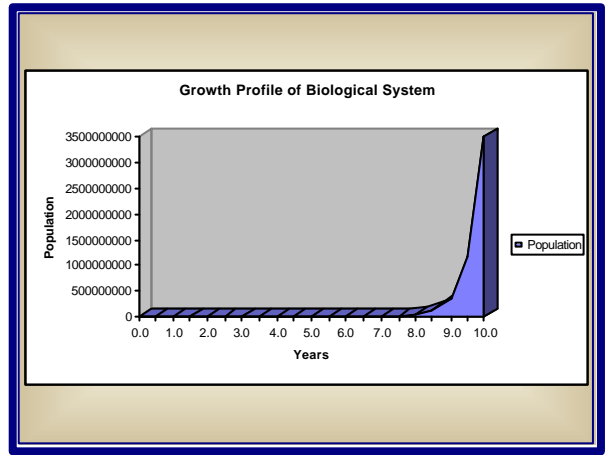
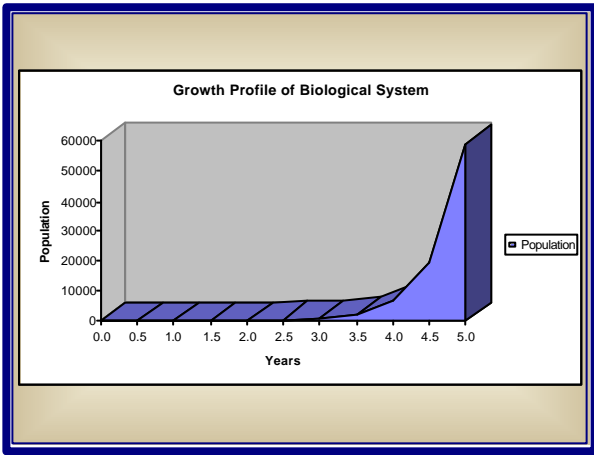


And the growth profile of a biological system that uses this structure?

Year	Population
0.0	1
0.5	3
1.0	9
1.5	27
2.0	81
2.5	243
3.0	729
3.5	2187
4.0	6561
4.5	19683
5.0	59049
5.5	177147
6.0	531441
6.5	1594323
7.0	4782969
7.5	14348907
8.0	43046721
8.5	129140163
9.0	387420489
9.5	1162261467
10.0	3486784401



Early field tests that I have seen of this structure in different parts of the world, have a pattern of tripling in six months. Tripling in six months! That is colossal. Doesn't look much for the first year or two does it? Three years, 800 or so.



Five years, wow – 60,000! Ten years – 3.5 billion. It never gets to that because it will saturate the population, and these structures don't suit everyone. But this does have the capacity to go way beyond critical mass in large systems intervention, within the time-frame that we have for problem-solving. I think the principles and structures and key insights of complexity probably hold the only ground for realistic hope in managing our way through into the future.

**Now is the Time
for all people
to come to the aid
of the planet**

The Party is over. Now is the time for all people to come to the aid of the planet



To work together in a coherent system of complexity for the health of the world.

Thank you very much indeed. Eve back to you.

* * * * *

Eve Mitleton-Kelly: We don't have very much time for questions, but I think we have so much rich input that it will probably take a little bit of time to actually digest it, but nevertheless please you know some responses from yes:

Q: Climate camp as an active (dis)-organisation is currently looking at how to proliferate and go to scale, and I think something that is holding it back is fear of the essential climate-campness being lost.

David response: Fear of the essential dynamics of the movement being watered down and becoming defuse. In complexity terms, where you have a vectored field of purpose, you actually begin to develop coherence and focus into a white hot concentration on purpose that is then distributed through the proliferating structure. Fear not, it will probably get much more sharply delineated and blow you out of the water in terms of its capacity to generate increased commitment and coherence. But I understand the fear – it is there in all organisations that face apparent disintegration of the control system. Let it go, it can grow.

Q: I agree with what David is saying. I just want to make one connection though I think I don't know exactly how it would work out, but I think something that I am connected with is a part of the unfolding principle. It is the Community Development Movement. In that budding process what is so important is the relationships between individual human beings and if you create a development in this country that specialises in how people relate to each other in communities. And it has had 50 years of understanding and working away unrecognised and not really understood in terms of what its gifts are. So I feel that more and more in community network which is about trying to get together the resources and key people who understand the skills they need. They do understand

how human beings get together in neighbourhoods and in areas where they come together to promote activities. It is interesting because I see the climate change movement as full of very enthusiastic, energetic individuals, many of whom have no experience whatsoever in community organisations. And that is a very interesting dynamic in itself which is now happening in neighbourhoods. But we have got long standing community organisations which understand the context of this kind of work, and now an amazing infusion of a new kind of people in this area who are enthused by these global ideas and threatened by them. One of the big challenges is how to build together these resources. I think the key to development you know, is a very important thing and of course it also understands a lot of the psychosis, psychology, and mythology to which David was referring.

David response: What we find in the world of community development is that the structures that you adopt don't enable you to go to scale, so this is something you can take on board and make it happen. But the relationship structures in each of these little cells are critical and we project into them and act out within them all our own psychotic defences, dependencies, and denials and so on. They become little points of personal integration and change, almost because we have to deal with that stuff, in order to do the task. So we have consciousness transformation going to scale. Just to add on the end of this, the idea of salt cells. Salt as Sustainability and Learning for Transformation cells. SALT, you add it to your community and it really makes a difference, it is a lot more tasty in the neighbourhood when you have got some salt cells replicating. The trouble is salt cells are square in three dimensions and they are inorganic, so I think yeast would be better than salt!

Eve Mitleton-Kelly: It is essential to point out the need to think in terms of different scales, the micro as well as the macro, because the community by itself is very powerful but it cannot do everything. It may be necessary but not sufficient.

Q: Mine is a quick one. The issue of hope. I have been on to these things in a crude way for 50 years. My personal problem is keeping my resilience going. And Granski is the answer which I keep in my phylactery. His great statement was that he is 'A pessimist of the intellect but an optimist of the will'. The whole question is what will we do about the will in this description of building cells. The other thing is that very, very few people know how to hold the map in their minds, even the image of the earth. I have tried, and it has worked fairly well, to work with people saying 'we are developing a psyche the size of ourselves in our present culture and that opens a whole vested interest. What we need is a psyche the size of the universe and humbly to find ourselves within it. Now that is a great opener for discussions about building of cells and passing on of the information. We have got the resilience of our will.

Q: David thank you very much for this. I will take away from this afternoon two very powerful images, one is the shoal with the shark and I wasn't quite sure whether the shark was thinking 'well I am outnumbered, I had better retreat!'. The other image is the image of all of these clusters right at the end, that scale. I wondered whether you could share your thoughts on what is going on at the boundary of those organisations. One whilst the shoal is in motion, active, engaging with external threats, and your other image was less active but very powerful, very resonant. Could you just say something about what we might do with our boundary work with this.

Q: Surprisingly what the last person was saying dovetails perfectly into what I wanted to say about shoals, which of course have the same visible grain as flocks of starlings do. There is a mind there, even though it is a ghost, and you see flocks of starlings going the whole thing with numbers, that is biological ramification. The same occurs if you reduce it by 10 to the 12, in the detonation of a critical pile of Uranium in nuclear fission. We need a critical mass or detonation process. What is

the meme that travels through that flock of beings thus like a uranium chain reaction that stops everything else in its tracks?

David response: Well, let's hold it through the boundary, minus three minutes for the timing. I love this pessimist/optimist bit. Pessimists are always such happy people because it is never as bad as they thought it was going to be. Optimists are always in despair because it is always worse than they thought, worse than they hoped. But holding on to personal resilience is critical and there have been times, when I have been working on this, that I have put my head on my desk and howled, as more data piled in and the reality broke through. I think each of us will find our own particular source of resilience. It has certainly driven me back, layer by layer, by layer, by layer to find as it were the irreducible core of me that will not lie down and die in the face of this.

Turning to boundary issues, the shoal was actually an unbounded shoal on that big picture, I showed little bits of it under attack and responding, simply to show how this kind of collectivity responds under certain stresses or whatever it is. The problem is that our own behaviour is also the shark at the moment. I can't go further, I am so glad these questions are being recorded.

Finally, I want to pick up with some of Ervin Laszlo's work here when he talks about the learning curve and going to critical mass in social behaviours. He says under very high stimulation and stress in a large social system, you reach a super-critical state. There it is not about a learning curve reaching critical mass and being tipped into new behaviour, it is about a phase-change in human dynamics. You don't go round looking for trim tabs on rudders of super-tankers. You look for the seed of the seed that initiates a phase-change in the macro system almost instantaneously. The question is: 'what the hell does it look like in practice?'

Eve, thank you so much for this wonderful opportunity. I hope this will be the beginning of ongoing work.

Eve Mitleton-Kelly: A comment concerning the shoal and the boundary. The principle is that the shark does eat some of the fish! The whole point here is that there is no central intelligence, organising the behaviour of the shoal. It is how each one actually is connected to the others and together they can act as one. The second point is that the boundary is very difficult to show as a circle, because we want to show something which is much more amorphous and is constantly changing, but it is present always and influencing everything else. So I think we have some ideas to explore.

* * * * *