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Futures of Europe

„It was the best times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair...”

Ch. Dickens, A Tale of Two Cities

Preface

Dickens' sentence expressing the unbelievable contradictions of his century was born nearly two centuries ago. The world has changed a lot since then but – if that is possible at all – it has become even more contradictory. Moreover, Dickens' words – which he applied only to contemporary Europe – are essentially valid today for the whole, globalized world. What do you think, dear reader, will be the retirement age, the price of petrol and the ratio of immigrants in your country (and in Europe) 30 years from now? Certainly you would be happy if the retirement age were 60 years of age, the price of petrol were HUF 200/litre and the ratio of immigrants' stabilized under 5%. Everybody would like these numbers, and this is why they vote at elections for those who promise it. However, the fact is that the retirement age will be 75 years, the price of petrol will be HUF 1500 / litre, and the ratio of “foreigners” will reach 20%. A considerable number of our neighbours will not understand our native language 30 years from now, they will dislike our culture and will be outraged by our way of living – which has been the source of the feeling of *confort* for centuries. These shocking elements of a vision of the future do not appear optional or avoidable alternatives. They all are an inevitable compulsion. Freedom of choice in this case is limited to the following: we do what we have to do immediately (and the pain of transition may be eased) or we postpone making tough decisions and the consequences arise later in an unexpected and shocking way.

The tipping point of history

The science of the end of the millennium enriched everyday language with the strange notion of the *tipping point*. The tipping point is the point the exceeding of which causes an abrupt, fundamental – and mostly disadvantageous – change in the quality of the system. Irreversible and fatal changes take place.¹ The tipping point occurs unexpectedly, virtually without warning signs and unnoticed – in Peter Apostle’s words it comes *as a night thief*. However, beyond it – just as for the suicidal person who has been jumped off the cliff – there is no way back. The catastrophic collapse of a social system was recognizable for a long time but based only on rare examples of isolated communities or small ecological systems. One of the best known cases is the story of the Easter Island.

One and a half thousand years ago after a long voyage the legendary chieftain Hotu Matu’a touched land on the Easter Islands which seemed to be Paradise. The climate was pleasant, the soil was fertile and the flora was diverse. The wanderers of the ocean settled on an island covered by huge palm trees and they soon populated it. The small communities owned 11 separate territories, led by their own chieftains and also competing with each other lived their everyday lives: they cut down the palm trees of the forests, and they decimated the original flora and fauna of the island. They erected huge stone works astonishing everybody – the biggest of which was the nearly 20 m high statute called today El Gigante, weighing 270 tons – with the help of which they wished to gain their Gods’ goodwill and support. During the one thousand years following the settlement the population of the island increased from a few dozen to about 10 thousand people. While the density of the population continuously increased, practically no trees were left on the island. Due to the disappearance of the forests soil erosion became more intense, which reduced the crops. No basic material was left even to build new boats. Thus fishing also stopped. Finally, there was not enough wood left for the islanders to cook meals, – they had to use grass to make fire.

When the number of the population exceeded 15 thousand people, famine, social chaos and cultural disintegration set in abruptly – practically within the life of a single generation. „The society was destroyed by mass

¹ Malcolm Gladwell. *The Tipping point*. Little, Brown and Company. 2003.

death caused by bloody wars and cannibalism” – J. Diamond’s description of the shocking end. Soldiers assumed power, the landscape was covered with spearheads produced in vast amounts, the winners ate the losers or enslaved them, the enemy tribes destroyed each other’s statues, people took shelter in caves to defend themselves. The formerly abundant island, one of the most excellent societies in the world, degenerated to the state Easter Island is in today: bare, grass- covered prairie, varied with destroyed statues, keeping only one- third of its former population”.²

Human communities – mostly – avoided the social catastrophes of the Easter Island. However, this awful fate was avoided more due to fortune than to wisdom. As soon as the conditions of life worsened due to overpopulation, a part of the given community simply migrated, the population was decimated by epidemics and war, or – if there was time enough - the societies culturally adapted to the new circumstances. The tragedy of Easter Island was caused partly by its isolation. There was simply no free territory in the Island’s proximity. Since they destroyed the trees people could not even build the boats they might have used to move elsewhere. The sensitive ecological system of the island “tipped over” unexpectedly and the communities were unprepared for the collapse. Therefore there could not even be hope for cultural adaptation. People attributed the ensuing tragedy to fate, they blamed neighbours for their problems and expected their life to change for the better through divine intervention. There was, however, a third reason for the collapse: the island was owned by groups fighting each other. Their coexistence was always burdened with conflicts but for a long time it remained at the level of tribal feuds. But as soon as survival became endangered the conflicts necessarily escalated into life- and- death struggles.

The question is whether there is anything that could connect Europe in the 21st century with those events on Easter Island which happened 500 years ago. Analysts of the turn of the millennium have identified four such factors:

1. The ecological footprint of Europe has exceeded the dimensions of the continent twice.
2. The number of children has not covered the demographic reproduction needs in Europe for a long time

² J. Diamond. The third chimpanzee. Typotex. 2000. p. 328.

3. The “Protestant ethic” is being forced into the background, and an “enjoyment- centred” *life- program* is spreading.
4. The culture of Europe – based on individual liberty, communal solidarity, democracy and the market – is reaching its tipping point.

Ecological footprint

Humanity has been following the path of fast growth in the past 500 years. The pace of growth is particularly striking as regards population. In the year 1000 there were no more than 250 million people, in 1500 there were already 450 million, in 1900 1.63 billion, in 1950 2.5 billion, and at the turn of the millennium there were 6.2 billion people in the world.³ At the same time consumption increased, as did the “affluence” of the technology serving to production of goods. The result of these three factors makes up the “ecological footprint” of the human community: the size of the area which is required by the given number of population, the habits of consumption and the technology used.⁴ The ecological footprint of humanity, which barely reached 60% of the earth in 1900, reached the size of the Globe by the end of the 1970’s and exceeded it in the 1980’s. As a consequence the expression “spaceship- Earth” gained a literal sense. There is no more space to “stretch” – similarly to Easter Island – and there are no lifeboats to move further.

The ecological footprint of Europe in total is about twice its geographic size in 2000. This overall measures contains typical regional differences: the Netherlands’ is fourfold and Eastern Europe’s is 90% of its territory. It means that the inhabitants of our continent have for a long time been sustaining their way of life – which is frequently viewed with dissatisfaction – at the expense of others, partly at the expense of societies living in other parts of the world, and partly at the expense of their own future generations! This situation is unsustainable in the long run – that much every analyst agrees on.⁵

³ David Christian. *Maps of Time*. University of California Press. 2004. 143. pages

⁴ Paul Ehrlich – Anne Ehrlich. *The Population Explosion*. New York Touchstone. 1990. 58- 59. pages

⁵ Global patterns in human consumption of net primary production. *Nature* Vol 429. 2004 Jun. 24. 870 pages.

Consequence:

Changing our way of life is unavoidable – we need to shift from a consumption- centred way of life to a sustainability- centred way of life – as well as to the enforcement of the concept of *strong sustainability*.⁶ It is likely that within 10 years a kind of a global ecological tax will be imposed on those countries and regions which occupy more than their ecological footprint. It will put Europe – and within it especially those regions (thus a great part of Eastern Europe) which struggles to catch up in terms of living standards and consumption levels – in an awkward situation. Therefore, for Eastern Europe, which is exceeding the “ecological footprint” of its own territory right these days, this ecological tax will be much less acceptable than in Western Europe.

The American president George W. Bush’s slogan „We do not bargain in respect of the American way of life”, which is arrogant and narrow- minded at the same time, is frequently cited pejoratively in Europe. However, an overwhelming number of the European people profess the same: „the bases of the European way of life are not up for bargaining”. The voters – and naturally the political parties as well – refuse to accept the complex problems that occur in the long run, and seem to be worsening. Thus those governments, which try to adjust pension schemes and the health systems to the increasingly obvious constraints caused by unemployment, dependency ratio⁷, and environmental protection, fail again and again.

The number of children does not cover the demographic reproduction needs of Europe

The second part of the 20th century passed in the shadow of the metaphor of the “demographic time- bomb”. However, the analyses made at the turn of the millennium provided us with a much more complex picture of the changes. While the acceleration of population growth more or less stopped in 2000, the population of the world continues growing and will reach 9 billion by 2050.⁸ But the regional differences become greater and greater, which will

⁶ It is important to make a difference between the concepts of the *strong* and the *weak sustainability* and to satisfy the requirements of *strong sustainability* in the economy and the way of living.

⁷ Old- age dependency ratio = Age 65+, as % of those 20- 64.

⁸ Joel E. Cohen. Human Population: The next Half Century. Science. Vol. 302. 2003 Nov. 14. 1172 pages.

have more and more effects in the future. On the one hand, the population of the 50 poorest countries of the world will have been tripled by the year 2050 and will reach 1.7 billion. And a significant part of their population will consist of a young generation depending on support. On the other hand, the number of children in each of the “developed” countries has quickly decreased and has fallen below the required reproduction level (2.1 children/woman). In accordance with an expert’s shocking formulation - *the best contraception is capitalism*. Where the women’s right to education and jobs is enforced, where individual liberty in determining the way of living is indisputable, where joining the labour market becomes free, the number of births necessarily decreases.

In this context the situation of Europe looks rather bleak in the long run. Two countries, Ireland and France lead the field (1.8 children/woman), while Spain and Italy are in the rearguard (1.2 children/woman) - in terms of population growth. The Scandinavian countries are at the end of the leading group with a relatively good position and Germany is somewhere in the middle with its ratio of 1.4 children/woman. However, there isn’t a single European country (except for Albania and Kosovo, perhaps) which would achieve the ratio of 2.1 children/woman required for reproduction “unaided”. By the year 2050 the ratio of dependency in Europe will exceed 50%! The situation in the East European countries is even worse – if that is at all possible. Russia, somewhere at the end of the line, will not be able to avert a serious crisis in the 2010’s. However, the situation of other East European countries, such as for example Hungary, also gives cause for concern. In its entirety the data suggest that in the next 40 years Europe will “lose” more than 80 million people. Since the Thirty Years’ War and the plague epidemics it has not suffered a demographic decline of such an extent.

Consequences:

To balance the dramatic decrease in the number of children European countries must turn to external labour forces, which at the same time deepen the internal cultural differences. Maintaining economic growth, providing the expected standard of goods and services, ensuring welfare services at a relatively high level – still considered low by many people – are possible only

by involving an external labour force. This will have two types of consequences which will generate complex social effects. On the one hand, the labour force – due to the scope of a relatively free movement – will migrate from the less developed regions to the more developed ones. It will increase – or at least maintain – regional differences, differences which in turn will bring about actions directed at alleviating them. On the other hand, the settlement of labour force from other regions will become a necessity – it will cease to be an option that one evaluates in terms of its benefits and drawbacks. The choice will only be whether the labour force (and population) is “exported” from (1) quickly industrialized Asian countries with huge populations – who follow a way of life very similar to the Protestant ethic but also face similar population problems in the midium- term, or (2) African or Near- Eastern countries where mentality fundamentally differs from the Protestant way of life, and which struggle with severe problems of a demographic boom. In the latter case, however, the cultural assimilation problem the host societies face will increase manifold.

The Protestant ethic is being pushed into the background and the enjoyment- centred life model is spreading.

The way of life – which has been “programmed” by the compulsions of circumstances for thousands of years and was received by the individual as an unavoidable condition – is increasingly becoming a matter of choice for the citizen. Europe’s economic and social success was based on a great number of social “constructions” – social and economic institutions – and these were rooted in the Protestant ethic. The most important of them, private property and enterprise, were based thereon, as well as the right to self- definition, the possibility of shaping one’s own future, disciplined work, high level investment in a personal future, democracy, personal liberty, and the laws securing them, and the impersonal market which extends cooperation to everyone. As a result of these the range of available products has become wider and wider during the past 500 years and accordingly the happiness- model based on consumption has become dominant. Finally, in the 20th century consumption became synonymous with happiness. This underlined by

the fact that until the 1970's statistically measurable consumption as well as the statistically measurable sense of happiness (general satisfaction with life) increased simultaneously.

However, as of the 1980's the tendency of increasing happiness halted. While in the industrialized world the national wealth, GDP per capita continued rising, the increasing ratio of people declaring themselves happy stopped.⁹ In the meantime two opposite tendencies developed: On the one hand, the advancement of a hedonistic way of life inspiring the generations following the baby-boom generation carried on. The average European youth's life objectives are: a shorter working time, fewer obligations, a higher level of consumption of high-class goods and a demand for a personal excitement-centred way of life. On the other hand, a growing number of youth feel that they have been trapped. In spite of the fact that the individual's wealth increases – more and more free time has to be spent on gaining possessions – their satisfaction with life does not increase.

Instead of the homogenised mass society projected earlier, the segmentation of mass societies can be observed. Societies become divided into social groups that following significantly different life programmes. Besides the hedonistic life model – which is inevitably concomitant with the occurrence of the group of “has-beens” and “people pushed to the periphery” – creativity-centred and community-centric life models take shape, but remain in a minority for the foreseeable future. The individual life model of the “voluntary simplicity”¹⁰ and the community life model¹¹ of communitarianism – considered primarily as an American phenomenon until now – are also spreading in Europe.

Consequence:

The “enjoyment-centred” life model is spreading, and becoming gradually mocked at the same time. In the foreseeable future the hedonistic life model will keep on “dominating” Europe. Its necessary concomitant, however, is that the life programme of the traditional Protestant ethic will be pushed into the background. The result is, that the individual commitment to

⁹ Robert E. Lane. *The loss of happiness in Market Democracies*. Yale University Press. 2000.

¹⁰ Cecil Andrew. *The circle of simplicity: return of the good life*. Hew York HarperCollins. 1997

¹¹ Amitai Etzioni. *The New Golden Rule*. Basic Books. 1995.

prepare for the future – i.e. investment in myself (studying, working), in my own future (further studies, saving, economy, starting a family, bringing up and educating children), which used to be a natural and inevitable condition - will diminish. The willingness to choose a creative life- programme (art, sciences and work) that requires commitment, sacrifices and perseverance decreases. The mass communications system’s behaviour “programming” coupled with significant peer pressure encourage people to use the consumers’ scale of values: don’t resist your desires, satisfy your senses, everybody was born to indulge you, throw away what you feel does not perfectly satisfy you. The lifestyle of the “desire- controlled” individual growing up in an “excitement- controlled” society, however, is bound to result in increasing dissatisfaction.¹² The slogan “Be realistic, wish the impossible” stressed in a different context, virtually “programs” a great part of the young generation to unhappiness.

The ability to assimilate the historically successful traditional culture of Europe decreases

In accordance with the laws of evolution human culture has been forming for a long time. Encounters between communities with different cultures played an essential role in this dynamic development. The co- existing cultures could “fertilize” each other, they could take over one another, try and fit elements of the “other” culture into the culture of their own. The meeting points of cultures – such as Europe – formed the most dynamic regions in history. However, the renewal of one’s own culture may involve conflicts and crises, taking over the “foreign” culture may entail the danger of rejection.

The latest studies attribute the cultural and economic successes of Europe to the appropriate social “institutions”.¹³ These are the developed market conditions, mentioned above, a functioning legal system, respecting social agreements, effective, transparent, and not corrupt governance, the enforcement of contracts without prejudice, economic regulations letting the individual’s interests succeed, respecting the rules of competition and the

¹² Barry Schwatz. *The Paradox of Choice*. HarperCollins Publisher. 2004

¹³ D. A. Hibbs and O. Olsson, *Geography, biogeography, and why some countries are rich and others are poor*. PNAS March 2004, 3715 pages. and J. Diamond, *Nature*, June 2004.

protection of both domestic and foreign owners. The basis of these “institutions” is provided by unconditional trust between citizens, readiness for cooperation, acceptance of fair solutions and willingness for agreement. These virtues, however, do not necessarily last forever.¹⁴

A large number of studies and particular social experiences show that if people feel that their complaisance is taken unfair advantage of, their helpfulness is not returned, their selflessness is not supported – then the cooperating, and cohesive society disintegrates. In Europe increasing number of people think that a growing mass of unknown people, strange habits, irritating sounds, foreign symbols, and most crucially “fare dodgers” surround them. The signs indicate that the capacity of European culture - based on confidence, freedom, diligence and performance - to accept and accommodate to other life- models is reaching its end. The most thought- provoking symptoms of the negative changes in the general feeling concerning “foreigners” are best demonstrated by the most democratic countries. In the Netherlands an inter- party commission of Parliament has come to the conclusion that the assimilation policy of the past 30 years has failed. Therefore, in their opinion greater efforts have to be made so that the immigrants would get to know, accept and follow the “local” values. Similar views are spreading also among the Danish and the British people, both of whom have been rather successful in accepting different cultures for a very long time. Thus larger and larger social groups *question* the currently operating model of “trust the foreigner”. The election to the European Parliament, which took place not long ago, partly shows that the net of trust extended to everyone, as well as permissive tolerance, have begun to fall apart.

Consequence:

Europe faces a shift in the cycle of basic- behaviour. Experiments carried out with real and computerized personalities have discovered an odd sample in the cooperation of the selfish but rational creatures. In the chaotic state of “everyone’s struggle against everyone” the lonely and selfish players starts to discover the possibilities lying in cooperation after a while. At first these players hesitate, then by taking courage, with increasing enthusiasm and finally with firm confidence they turn to their neighbours. And later the

¹⁴ Marosán György. Élet és Irodalom. Élnék, mint a disznók (Living like pigs) 25 March. 2005

threads of the confidence are spun beyond the circle of friends and the members of the community start to follow the so-called tit-for-tat strategy.¹⁵ This mirrors to everybody their own face: if you are nice, cooperating people look back at you, if you are a swindler, then you have to face retaliatory actions. In the long run it teaches everybody to cooperate and trust other people. And when the strategy of confidence wins, the players willingly forgive the few and accidental cheats. However, due to the strategy of the *permissive generosity* – we can say the *welfare* tit-for-tat – it will be increasingly profitable to be a “free rider” in the community.¹⁶ And when the proportion of the “cheaters” breaking the rules exceeds a tipping point the community’s tolerating ability and trust in each other decreases by leaps and bounds. The decreases threads of cooperation reaching everyone is cut and the formerly cohesive community falls apart into small groups treating strangers distrustfully.

Final evaluation:

It seems that the societies in the developed world, and Europe among them, are reaching a social tipping point. A sign of this phenomenon is that even in the most tolerant societies people start to treat “foreigners” with suspicion. The signs suggest that the dethronement of the *permissive* “tit-for-tat” has started, and the former, *cruel* “tit-for-tat” starts to gain ground again. In the foreseeable future Europe will have to face increasingly serious and complex problems. These are the following: the unacceptably big ecological footprint, the decreasing number of births, the financially non-sustainable pension and health-care systems, decreasing competitiveness, high levels of unemployment, the spreading of antisocial behaviour and religious fundamentalism. However, based on experience it seems likely that citizens are refusing to face these problems. And since voters do not address them, politicians will also pass the buck. This will deepen the problems caused by the proximity of the cultural tipping point. This has been demonstrated by the strange “wars of religion” emerging in the past years. In a variety of forms we were able to witness the increasingly violent wars over symbols of

¹⁵ Robert Axelrod. *The Complexity of Cooperation*. Princeton University Press. 1999.

¹⁶ György Szabó, Attila Szolnoki, Rudolf Izsák. Rock-scissors-paper game on regular small-world networks. *Journal of Physics A*: 2004 Febr.4. 2599 page.

communities of different religions or cultural traditions in almost every country in Europe. Europe – in accordance with the author’s prediction – will become more liberal (economically), more withdrawn (socially), more conservative (politically) and its politicians and voters will be more susceptible to populism.

The developments of the last two centuries one can characterize by a strange duality: while America followed a evolutionary pathway, Europe seemed to apply a revolutionary model. On the Old Continent the main political movements - conservatism, social democracy, and liberalism – while competing partly against each other, and also against the totalitarian movements, all fought for hegemony. If any of these came to power, they did as much as possible to form all institutions, mechanisms and relations of the society in their own „image“. America - on the contrary – historically accepted a certain minimum of conservative and liberal values, institutions and mechanisms, and let individual peoples freely create their own communities satisfying these minimum conditions, but fitted to their own specific interests and ideas. Charles Fourier published in 1832 an interesting analysis – „Le Phalanstère“ - which outlined in detail the perfect society. But, while he was waiting for the support of the kings, or of peoples, his plans remained only a dream. In America within the framework of a liberal minimum, people established hundreds of communes, and create communes until now. The „inventors of the perfect community“ – like Robert Owen – chose America just because, the New World had open free space and wide range of opportunity for the experiments, while Europe always has a scarcity of opportunities to create a new community.

The end of the 20. century brought closer the once distant American and European models. Europe was forced by the fierce competition of the economy to acquire some elements of the more market- oriented, and more individualistic American model, while America also discovered and adapted some mechanisms and institutions of European welfare systems. In the 21th century however the culturally colorful, but from the viewpoint of the welfare system generally supposed homogenous Europe will become a much more differentiated society. It seems to me, that the competition between different

political movements leads not a homogenous model, with similar institutions, mechanisms and solutions everywhere. In the future we may expect, rather, the creation of a state characterized by a certain minimum mix of democratic, liberal, social-democratic, and conservative values. In this minimal state, which can be acceptable by all political movements, there will exist many different forms of institution, and solutions, and also local communities, consisting of peoples living by different way of life. Europe will not become more homogenous, however this statement means more than, merely, maintaining the cultural differences. Moreover, the real challenge for Europe is, that the differences between life-modells of peoples cut across the traditional national, regional, ethnical differences and class distinctions. Europe - in a certain meaning - „recrystallizing”: within the existing national, and ethnic communities and cultural boundries will emerge new ones, then this new cultures and communes will amalgamate and transform the traditional societies. 21th century Europe – contrary to the traditional assumptions, which forecast the strengthening of the traditional national culture, or, on the other side, the spread of the cosmopolitan and consumption-oriented culture – will be a Continent, where, within borders of the traditional countries will exist many different communities, with many different cultural roots, created by their members based their own interests. All this however will be a very contradictory process. The wife of Kósa Ferenc – one of the most famous Hungarian filmdirector – is a Japanese women. When a new schoolmisters meeting their son, Bálint, and realising his „cross-cultural” face, cried with surprise: „So, you are half Hungarian, and half Japanese”. But, Bálint, told her, with pride: No. I am not half hungarian, and half japanese. I am, - on one hand - totally Hungarian, and, - on the other hand - I am totally Japanese. The future of Europe depends on how we perceive this multiculturality: are we to welcome it with pleasure, or are we to live with an identity crisis.

Certainly, the scenario outlined above *is only one of the possible visions* of the future. However, the English historian Hugh Trevor-Roper’s adage about the past is even more apt at characterizing the future: ”History is not merely what happened: it is what happened in the context of what might have

happened¹⁷". Reflecting this the researcher's most important task is to find the variants of the visions of the future and to disclose the factors influencing the choice between them.

To approach, and to understand this new situation we need however new methods. There are a lots of concepts which describe the changes in the course of transformation of systems. These concepts explain trends and the point from a system changes their behaviour and qualities. To characterise the transitions and changes we use different concepts: tipping point, point of no return, critical mass, phase transition, critical points, self-organized criticality, threshold, point of inflexion,

The „tipping point” phrase was first used by Morton Grodzins in his analysis and was published in Scientific American 197 (October 1957) in „Metropolitan segregation”. It became known in the classic paper of Thomas Schelling, „Dynamic models of segregation” in Journal of Mathematical Sociology” 1 (1971). Both papers sought to explain the abruptness of white flight from racially mixed neighborhoods, once a critical number (about 20%) of black people move in. What's so counterintuitive about this phenomenon is that a seemingly harmless individual preference (a slight desire to have some neighbors like yourself) can snowball into drastic and undesirable social outcome (total racial segregation).¹⁸

The wider public first became aware of the concept of the *tipping point* after publication Malcolm Gladwell Tipping point.¹⁹ The author provides a lot of examples about abrupt changes in very different phenomena: in social movements, epidemics, and fads. All phenomena were dependent on contagion in one form or another. In his book „Six Degrees”. D.J. Watts²⁰ analyses the mathematics of epidemics, by the SIR (loss of immunity, infection, recovery) model. By describing the emergence of the logistic growth, - displaying the slow-growth, explosive, and burnout phase - he identifies the threshold of an epidemic. These types of critical thresholds are connected to the concept of phase transition, and also connected to the tipping point.²¹

¹⁷ Quoted by: Philip Ball. Critical Mass. William Heinemann: London. 2004. p. 363.

¹⁸ Steven Strogatz. Sync. New York 322 pages.

¹⁹ Malcolm Gladwell The tipping point. Abacus. 2001.

²⁰ Duncan J. Watts. Six Degrees. (The science of a connected age) W.W. Norton and Company. 2000.

²¹ Albert-László Barabási. Linked. Perses Publishing. 2002

The epidemic's like changes one can be discovered in the diffusion of new ideas, or new products also. The Sharp introduced the first low-priced fax machine in 1984 and sold 80,000. For the next three years the business growth slowly, but steadily. The tipping point of the fax machines was in 1987 - when enough people had faxes, that make sense for everyone to get a fax - and suddenly was sold more than 1 million fax machine.

The *critical mass* - based on the dictionaries - minimum weight of fissile material required to sustain a chain reaction. In the social sciences the concept of critical mass is used to describe the phenomena that in different fields of social life there are a minimal cost, expenditure, attention which maintain a process, or sustain a trend or make possible the continuous work of an organization. There are some more concepts coming from the physical sciences - critical point - which widely used to describe social phenomena.

The *critical point* describe a certain level of the phase transition. Originally the Van der Waals' theory explained the existence of a critical point at which the liquid and gaseous states of a substance become indistinguishable. In his book Philip Ball²² find that „it is now fashionable to see critical points everywhere.. and are at least a good metaphor, and sometimes rather more than that, for strange combination of unpredictable and the rule-bound that governs much of our life”.²³

The phenomena of *self-organized criticality* was discovered by Per Bak, Chao Tang, and Kurt Wiesenfeld. They analyse the behaviour of a pile of sand. Dropping grains of sand one by one onto a table top. The pile builds up slowly into a little sand mountain. Once the slopes reach a certain steepness, dropping new grains on top can trigger an avalanche. Before a certain point, the grains are held in place on the slopes by friction, which prevents them from sliding. Each avalanche releases „tension” in the pile, lowering the angle of the slope and restoring the stability. But then, as continuously new grains are added on the pile, the system newly reaching the point of self-criticality, and the very next grain could trigger another landslide.²⁴

²² Philip Ball. Critical Mass. William Heinemann: London. 2004.

²³ Philip Ball 283. page.

²⁴ Philip Ball. 298. page