

THE RAY OF CREATION

Radislav Jovovic



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Reviewers:

dr *Veselin Drašković*
dr *Sanja Bauk*
dr *Mimo Drašković*

Lector:

Magdalena Reljić

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1. THE RAY OF CREATION

Today, the world is littered with books, even bestsellers, advising you how to become yourself, "seducing" with their titles, such as the following: *Change your thoughts; Change yourself; Now, discover your strengths and outline a new direction*, etc. Each of these books (manuals) offers a new strategy of redefining the entire human life. But all these tips do not necessarily lead to the objective pursued; instead, they actually increase one's anxiety and uncertainty. The aim of this book is not to advise how to "become yourself", but to assist in developing the power of observing the forms that affect our lives, to understand the hidden imperatives and codes of existence (i.e. how to reveal the veil of intuition and givens).

Life, I know, can not be reduced to the book, but neither the book can be reduced to the life. However, a good book is important in our development. Especially the one featuring real life experience. That kind of book promotes imagination, elevates and exalts it as reflections of soul's fires, that we create and flare up during our journey called life. Those fires need to be constantly stirred up. Here are pooled the childhood illusions and other fascinations in life, as well as its lyrics, encouraged by arts (poems, novels, paintings, sculptures ...) or imagining the future, which is enabled by science and imagination. There is no difference nor distinctive border between them, because they permeate a large extent, (i.e. it is hardly possible to draw the line between life, poetry and science). The illusion fosters imagination, and imagination fosters the force of creativity. The basis of these capabilities is imagination. How to develop imagination and raise it to a higher level? – this question had been preoccupying me for a long time, firstly because of the my own growth, but also because of the growth of my students. Searching for answers, I have accumulated an extensive and varied material, which occupied all the chambers in my head. This book is the format, that I chose to convey the collected material to others, in order to

help raise creativity of the individual. Due to the aspirations of the book to be helpful in this regard, I do not want to limit it only as the scientific reading, since it would lose verve, rhythm and enthusiasm, which represent the fundamentals of creativity (creation). I am seeking a proper form! But, it does not mean that I used delusions, on the contrary – everything is based on facts, experienced or processed, literary or scientifically. Therefore, the sources for this book are: world (society), nature, and books. The world is an open book from which a man has taught the stream of time. Everyone is seeing the book from very own point of view, everyone is wearing own glasses, everyone has own telescope to scope the future. The most creative men have changed the world, and many have saved their visions and experiences in writing, leaving literary works. Numerous written resources have been the foundation, and have been used in the process of creating this book. I will mention those that I think are the top of the list: *The Mountain Wreath* and *The Ray of Microcosm* (Petar Petrovic Njegos), *My theory* (Albert Einstein), *On the Revolution of the Heavenly Spheres* (Nicolaus Copernicus), *Dialogues Concerning Two New Sciences* (Galileo Galilei), *Harmony of the World* (Johannes Kepler), *On the Electrodynamics of Moving Bodies* (Albert Einstein), *On the Shoulders of Giants* (Stephen Hawking), *A Brief History of Time* (Stephen Hawking), *Through the Realm of Science* (Milutin Milankovic), *Mathematical Principles of Natural Philosophy* (Isaac Newton), *the Bible, Qur'an; The Bridge on the Drina* (Ivo Andric), *Politics* (Aristotle), *The Origin of Species* (Darwin), *The Wealth of Nations* (Adam Smith), *The Attic* (Danilo Kis), *Ulysses* (James Joyce), *The Trial* (Franz Kafka), *Anti-Liberalism in 22 pictures* (Madžar) *Become yourself* (Jacques Attali), *Anthropology of Creation* (Veselin Vukotic), *The Ascent of Man* (Jacob Bronovski), *Religion* (Djuro Susnjić) *Methodology* (Djuro Susnjic), *Institutions, Order, Transition* (Veselin Draskovic, Mimo Draskovic), *Markets, Morals and Policy-Making* (Enrico Colombatto) ... My thoughts originate from this spiritual heritage. They grow like plants, that can not develop without their roots. Writing, for me, is giving my own self – to what I have read, studied and adopted, what I have learned from the teacher, adding my own contemplations and judgments. In the "quiet storm" creation, my every thought has passed through the shadow of doubt, through a sieve of shaping my own interlaced thoughts. It is logical that the legacy and experience worth thousands of years, prevails over my present moment

and contemplation, of my belief and ability to create, so "if this is really the time when I raise my torch," I will admit – a little of my flame will be in it.

Heraclitus wisely state: *"Everything flows. All entities move and nothing remains still. No man ever steps in the same river twice, for it's not the same river and he's not the same man."* Perhaps Heraclitus was right when talking about the matter. If we talk about the idea, we must not avoid stepping into the ideological heritage, because it is the light that reflects humanity and spirituality. German poet Goethe once said: "He who cannot draw on three thousand years is living from hand to mouth." Thus, the ray of creation has deep roots in the origin and existence of man. Unfortunately, I think that we live in a spiritual desert, characterized by superficiality, lack of commitment, and lack of deeper meaning. This book, therefore, supports the basic idea that if enough people manage to change ourselves, then we can change the world.

My goal is to express, according to my power, everything which, to my recognition, may help in developing a mote or song of creation, and from what my senses been receiving, through sieving of settled practice, from the lake of sweat, impressions and emotions, and to raise the foundation of this book, hoping that it will convey the energy of creation and creativity. Using other people's knowledge and my own experiences, in an effort to shape my inner world, "my story" emerges in a unique and unrepeatable moment of time. That makes it different, but not ideal, because it is the product of one man. It was created from my childhood to this day - in a dream, in reality, during long walks, in conversations with people (friends, colleagues ...), with parents and family. I strive to achieve general knowledge through special prism. Therefore, every fact, every idea is important to me, so I could pull the truth and common ground from the base of life and literature, for all people. Considering this perspective, I see the purpose of the book. And the thoughts spilled into it will, I hope, throw the light of imagination far away.

Hence, the basis of this book consists of various knowledge resources. In addition to numerous books I mentioned, the most important to me is to rely on the following: 1. personal life experience; 2. long professional experience in professorship, consulting, and managing; 3. the idea of a "new science" (in particular, quantum physics, the science of chaos and complexity); 4. observations about the world, which I exchanged with students, especially those at master and doctoral level studies.

The ray of creation

In the foundation of our ability to create is the ability of imagination. Imagination is a special human talent. Creating ideas is a special act, not only of poetic, artistic or scientific intellect, but the intellect of all men. Ability to imagine allows us to create images (ideas) and to combine those images in many ways, which is only human ability. Here we mean images (ideas) in the broader sense, not limited to the images that we see with our eyes. The most important images for a man are simply words as abstract symbols. We know that the human imagination depends on the configuration and development of the brain. We control our sense of the past and the future, and within this area we place all other images. In our brain we imagine even the images that did not come through our senses, and thus preserve the heritage of the past, but we also imagine the future. The ability of dealing with symbolic images is the ultimate gift. Nearly everything of value initially originate in the " brain's eye." Imagination can be rational, literary, or artistic.

I will start with my own experience: when was the beginning of my pre-imagination? The first fire of imagination and aspirations for the spiritual breadth was ignited in Bajovo Polje, a village in the mountainous Piva. Scents of my neighborhood, its tastes and colors, shifts of days and nights, the rain and the sun, were so dominant in my childhood. Everything was there: variety of trees, bushes, shrubs, dense, green grass, the charms of nature, unfathomable colors of the flower meadows, luscious fragrance of the entire celestial dome, bird songs, sizzling crickets, the sound of white birch, mystery of the woods, wormth of the parental home, blueness of the sky, eternal Sun, swarms of inscrutable stars... All these images continue to live, to exist, carried inside everybody born in this beauty. The horizon dominates, glowing in colors and light of the archangels; filled with the bird songs and subtle music of butterfly in rainbow colors. Together, in dreams, rainbows creates a scene in which the soul resembles the matter. It is not accidental that Nabokov, a great writer, loved nature and butterflies. Or why Newton sought the secret of the universe in a rainbow of colors! Or why was the *Ray of Microcosm* written under the Montenegrin sky and for it. Yes, my hometown is really beautiful place. Above it, the blessed, unique and lofty sky is expanding and laughing. Nature of Piva is unruly in all its splendor. All this beauty is even more beautiful in the reflection of the clear river Piva. And there, the imagination was born - unseen beauty and poetry of the world, that elevates thought and the man with it, all the way to cosmic

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heights. This imagination has given me faith to think and create. We all have our sources of imagination.

I assume that "all imagination begins by analysing nature," said Leonardo da Vinci, a great artist and inventor. Michelangelo showed it in his sculptures: *"The mind and the hand become one, from the model so fragile and unknown, through art they breathe life into the stone."* (Michelangelo). Interaction of ideas and nature breeds the stony magic of David. Is there a more wonderful hymn to the ray of creation?

Not wanting to be a slave of writing form, I have learned from Kovac, Kis, Nabokov, Joyce and others, and therefore I realized that in favor of the essence, the change of form is crucial. Essentially, I wish that this book affect the change of thinking. I want to get you to discover epiphany (Renaissance) in yourselves, and that is, in my opinion, in the nature of a man destined to create, and to give his contribution to the world through the creation. Enthusiasm and an intense inner life give us the defensive power that allows happier life. The tendency towards lucidity is the same as the desire to create. I will not say that this topic is my only obsession, but it is certainly the main (obsession of creation, of creativity). Kis says: "Creativity - the creation is opposite to the world of barbarism". It is a world of goodness, beauty and grace (which is probably the same thing), where science, art, poetry and music show their effect on the human heart. And they have been doing it since the world has been created. So, the heart is seemingly a source of wisdom. From its depths we receive signals: the ideas to create, and the inner voice of our being - *life should be filled with creation!* This is the meaning, the essence!

Creation has built and improved man. Today we use things that man has been achieving through a long process, step by step. Everything visible has been created in the creative invisible storm. People were seeking a way to rise, to express their essence, critical thinking about the phenomena and problems that were pressed; they sought to understand the processes and phenomena; through a process of creative storm they liberated their mind, collecting new information and knowledge about the world. In the creative process were born ideas, transforming through discoveries and inventions, and brought to life in usable values: houses, cars, boats, airplanes, computers... The level of human achievement often directs our thoughts toward creative ideas, to the need and necessity to ask ourselves how something emerged, which idea preceded everything available today in the

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art, technology, organization, business, medicine... It all started in someone's thought and idea, which materialized in the creative process. Naturally, the creators admire not only their ancestors, they think about the future 10, 20 or 30 years from now, they think how to improve themselves and contribute to that deep river of creativity the best they can. I say the creators, but they wither. Indeed, people are generally satisfied with what we inherited. Their curiosity is stifled on a dry laurels of their ancestors, and their eyes are turned to the past. That kind of life is a still river: flowing, but slow, on the reflections of the past creative process. If the river is a metaphor for life, then the future of the river is full of whirlpools, bends, and stream must have a strong nut. We know why: the complexity of the world is greater than ever, global processes have increased and the world has become a global village. We must react quickly, and answer the strategic questions: Where will we be for a year or longer, how will the world look like then, will there be enough resources? Who will win the age-old battle: individualism or collectivism? How will demographic situation develop? Which political system will be then? Who will win the scene: market and democracy or dictatorship of force? What will be the relationship between the local and the global, and so on. The truth is that many of these issues are not new, many have been existing for centuries. But they are current, and we are interested to prepare ourselves for the future, for what awaits us, because the younger generations, especially, will be actors on the theater of life for 20, 30 years or more. The complexity of the economic and political life, as well as global processes, intensively affect the importance of understanding the future (i.e. the orientation towards the future). The only advantage we have is to observe trends, which dominated in the past and which will continue. When we think about the future, it seems that methodology is the best scenario. The future certainly carries uncertainty and this fact alone indicates the need to work on reducing uncertainties and predicting events, and to be prepared for them.

Preparing for the future requires analysing tendencies that have dominated in the past, and exist in the present. In doing so, the researcher should not divide the past and the present in order to better understand the world. He should discover the phenomenon and gain knowledge about them with his spirit and essence of the knowledge, until it becomes a practical knowledge. Then, the knowledge should be conveyed on readers in a specialized, easier and more convincing manner. How to achieve this? Some

do it carefully studying the data and reality, plunging into the essence and meaning of reality, and the other with ease of intensive insight (instinct) and knowledge discovery.

Thus, as the circumstances guided our ancestors to think, to come out of the mold and resign from the valid paradigms, we are in the same position: we must critically accept the reality around us, understand this reality, comprehend the processes, discover the heart of things on the basis of phenomena and facts (manifestation of the essence). Facts are the codes of reality. They transform into information and knowledge through the use of creative scientific methods, that through our *mind eye* see the invisible - that is the essence of things. The reality (world) is not still, it exists in the dynamics, the changes catch up each other; Time is in motion, the new is created in the disappearance of the old! Changes are happening through creative destruction. We have to get out of the shade, out of the mold, from uniformity, in order to gain competitive capability and to compete in the world full of creative destruction. Understanding the dynamics in life and economy allows us to eliminate some dilemmas, which are still steadfastly presented by many economists. These are, in fact, doubts in economics as a science, which essentially arise from the detachment of economic science from economic reality. Economy of the Middle Ages (feudalism) is not the same as the economy of industrial society, and then both of them are different from the economy of digital era. Those who do not understand this, hit a dead end. The economy is not a complete science, because even the economic reality is not completed, nor static. The dynamics of reality requires continuous thinking and frequent changing the paradigm of thinking.

Continuous thinking strengthens the mind. In a biographical note, published by the "Experimenter Eletrical", Nikola Tesla deals with events from his youth and talks about the troubles that have forced him to continually exercise his imagination and introspection. This spiritual activity, initially prompted by disease and suffering, slowly became his second nature and led him, finally, to the knowledge that he turned into an automaton, devoid of free will in thought and action, a robot that only responds to environmental influences. Awareness of the outside influences, which encourages him in any effort - mental or physical - was always present. Tesla has learnt dozens of foreign languages, he studied literature and art, and the best years of his life were spent in libraries, reading

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everything he could get his hands on, from Newton's Principles to the novel of Paul de Kock, often wondering and worrying: Was he actually wasting his time and life?

However, much later he realized that it was the best for him. Learning has "sharpened" his mind. His knowledge of art, painting, literature and poetry, later served as an inexhaustible source of inspiration and strength. Thus, the idea for his first big discovery flashed in his mind while he always reciting his favorite poetry to his friend. He knew by heart entire books and could read them of the top of his head, word by word. One of them was Goethe's *Faust*. It was late afternoon and the sun was setting, amazed at this impressive sight, he remembered the verses:

*Yet finally the sun appears to sink;
And a new instinct awakens.
I hurry onward to drink his eternal light,
The day before me, and the night behind,
The sky above, the waves below –
A splendid dream until the sun fades out.
Ah, if only the wings that raise the spirit,
Might be brothered by strong earthly wings!*

As he spoke the last words, bemused and wonderstruck by the power of the poet's expression, solution of the idea flashed in his mind, bright and clear like lightning. Instantly, he visualized it all, and with the stick drew necessary schemes in the sand. Later, these schemes have been used as illustrations in his patent conclusions of May 1888. The idea, crude and imperfect, occurred to him a few years earlier, but the physicists of the time considered it impossible. After so much brainstorming, one imaginary poetic moment has completed the initial thought, and the idea came to life! In other words, Tesla figured out how to construct a motor with AC power, and we all know how much that invention contributed to humanity.

For his great inventions that obligated humanity, Nikola Tesla is a unique example of how the effort without pressure can provide remarkable energy and results, while every effort under pressure requires the sacrifice of life energy. His working day started at 10.30 AM and finished at 5 PM the next day. Could you believe it?! It means that he had less than 5 hours to rest?

Tesla is a striking example of how to boost creative thinking in a favorable environment. Undoubtedly, daily lessons are necessary, and their purpose is to strengthen memory and reasoning, and especially the critical thinking. It is preferred that such an exercise is composed of various tasks; for example, repeating long sentences or calculating mentally.

Contribution to life, business, art and science, demands self-control, strong will, control of desire and urge to persist in the ongoing mission, to bring works and other ventures (projects) to an end, which often creates difficulties. Would you give up reading Voltaire's all the works if you found out that he wrote a hundred large volumes while drinking 72 cups of coffee a day? Tesla did not give up.

When I was pondering whether to write this book or not, my decision was not easy because I knew that, if I decided to write it, I would plunge into a time-consuming process. And time is a scarce resource - once passed, it can not be returned. As we all know, good or bad choice can be a result of consistent reasoning – rationality, (i.e. relation between costs and profits), but also emotions. However, my work is driven by emotions, and in this book you will not find any cold-blooded, calculated greed. I only hope and expect to contribute to the idea of creation.

I have devoted a lot of attention, energy and time to bring out the legacy for the idea of creating, and to add something of my own, so the idea could get an external form - the reader. Every sentence was repeatedly processed in my creative artistic procedure, in order to pave the way to every word and every content, in which I have added as much truth as possible, since: *truth is a matter that concerns the mode of presenting the truth.*

A special inspiration to write this book I found in the works of Carl Jung, the famous psychoanalyst, who said: *If things go wrong in the world, this is because something is wrong with the individual, because something is wrong with me. Therefore, if I am sensible, I shall put myself right first... In the last analysis, the essential thing is the life of individual. This alone makes history, here alone do the great transformations first take place, and the whole future, the whole history of the world, ultimately springs as gigantic summation from these hidden sources in individuals. In our most private and most subjective lives we are not only the passive witnesses of our age, and its sufferers, but also its makers. We make our own epoch.*

2. IDEAS AND CREATION

The idea dwells in our spirit and intellect, therefore, it is equally linked to the heart and mind. Famous Lexicon Platonicum states that *the idea is a form of things the way they reside in our mind and spirit*, (i.e. the idea is eternal and constant, in other words - it is their model). According to Thomas Aquinas, *the idea is interchangeable form by which a man creates a visible act, for example, the idea persists in the mind of the builder, since the builder intends to build his house like the form conceived in his mind*. The idea is created through the art or science, or through business, depending on the type of an idea. Certainly, creating idea is an art, whether the idea is realized in the arts, business or science. It enables materialization of the idea. To achieve this, one uses realistic means: words, sounds, colors, movements, etc. In this book, I have used words to "see" (materialize) my thoughts, which I wanted others to "see", so those words would be transferred to other small worlds, (i.e. so my microcosm would communicate with others about the idea of creation). Perhaps someone's microcosm, at least one, would benefit from this form of thinking; perhaps the thoughts and insights that I have come to would affect the expansion of the reader's spiritual horizon and help him to draw strength and energy for new ventures. I seek for to the formula of medieval master builders, according to which the subject must be beautiful (*perfectio prima*) and useful (*perfectio secunda*) at the same time. (I remind you that this is a requirement of the commercial world in which we exist and act today, the condition that we must fulfill in order to stay in the market.). There is also a creative act, that is, the connection between the forms of things residing in our intellect and their materialization. Through the creation, in the spirit of the master builders, as an author I want to share the joy of the creative act. This act has produced several subjects (chapters), which are naturally

combined in the book's composition, I hope, at least a bit of a *Magical Synthesis, the Grail Stone of Creation*. Objects produced using millions of thoughts and emotions are necessarily reduced in the creativity process.

A creative act is the most precious part of life. So, dear reader, stay away from festivities and reflectors; go where the natural life is substantial. Ivo Andric, a great writer, was running away from the spotlight throughout his life, even from celebration on the occasion of receiving the Nobel Prize. However, you can always choose the world of creativity, imagination, dreams, poetry, prose, the world of the creative processes, the world of creation. This choice is accompanied with a few questions: *How to start dealing with creative ideas? How was something created, which ideas preceded the reality that surrounds us - from engineering, through business, to institutions? How to improve all that? Where can I give my greatest contribution?*

We are all gifted with the ability to identify, investigate and conclude, to inspire, design, and build. Thanks to this ability, our ancestors have enriched this planet with monuments of beauty, size, and awe.

They entered the bowels of the globe to release the vast resources of energy for their own use.

They conquered the blue sky and dark depths of the ocean.

They entered into the structure of matter, reached the deepest hiding places and cavities of the molecule.

They tamed and put into his service the gigantic forces of the waterfalls, wind and tide.

They captured thunder and lightning of Jupiter, that nullifies the time and space.

They even made the Sun obedient and subordinate.

Do not be surprised if you sense the tones of my fantasy, because I think that, despite the documents, facts, information, or a variety of factors for constructing a written text, the share of fantasy is primarily adding value to this work. So, my goal is also an artistic experience, awakening of spirituality in the reader, striving to awaken the illusion of creation. Sources for this book are numerous, as I said, but that does not mean that I avoided to give my contribution. On the contrary, with all my intellectual forces I have been trying to enrich this text! And I sought to achieve that through the process of transformation; reality and documents about the reality have been

refracting through my telescope, (i.e. through my imagination. It is logical that I have used the documents to my taste and conscience.)

The Choice

The world today increasingly restricts the creative power of ideas and the freedom of individuals. Modern man is spiritually numb thanks to the benefits of technological civilization. How to free our mind from monotonous rhythm imposed by the techniques and social reality? Unfortunately, people are under the terrorism of consumer's choice, which should not be confused with the idea of choice, which is creatively oriented. Terror of consumer choice limits and prevents the exploitation of our natural resources.

The easiest choice is to rely on the resource allocation by the state and to its protection. This means relying on the routine, habits, it is a common path, chosen by the majority. Another way is to move from passivity to activity, to choose the path of creation. This means no more expectations that someone else would solve your problems; nothing is impossible. It is a path where you will not be disappointed.

The trouble is that most of us simply do not think! We simply avoid choices and let things happen on their own, pleased that we pass through life like a sleepwalker or *as bits of flotsam in the stream of events* (Zohar, Marshall). Not to choose is to lose a frightening extent of potential that each of us possess!

Today, the world is unbearable, but it seems that it will be even more unbearable. It is time that everyone relies on themselves. For such a choice, to independently create your own success, you need to have confidence in yourself. Dare to think that all doors are open for you. Have the courage to reconsider, to change the established order, to act predictively and to view life as a beautiful work of art, because in that position you are entirely the creator of your life, and not someone else! And your life is the most beautiful instrument to create. Lift your head and look around! There are so many places where you can find creative force, think about all circumstances that are prerequisites for your future. There is no time for hesitation, not in today's dangerous world. Your age is not relevant, nor your gender, background, social status, material resources - you have enough strength to oppose difficulties, even those that appear to be extremely unfavorable. You

have the power to change your destiny completely, as well as the fate of those who you love and who loves you, but also the fate of generations to come.

There are many opportunities, but also threats and limitations. The economic crisis in 2008 seemed to reveal a bleak picture of the world and gloomy thoughts. Troubles are lurking everywhere, taking place around the globe in the name of the worst intolerance, and darkest ideology; the blaze of religious wars is rising; successions are multiplying; differences are feeding one another, the environment is polluted more then ever; food is poisoned; employment is hard to get, the middle class is disappearing; the growth does not fulfill the needs of urban population, which is growing; inequality between rich and poor is rising. The result: safety has been reduced!

Economic growth is not sufficient to maintain the standard of living and all parties are at serious danger: the state and the entrepreneurs, especially those who are living off of credits - or on the shoulders of previous generations, pillaging their legacy, or those living at the expense of the future generations, degrading their potential wealth. Dispite all these threats, most politicians and company managers are self-absorbed. Politicians only seek to increase their popularity, especially when elections are approaching, through demagogic statements and decisions; company managers try to wheedle the shareholders, through feverish profit making...

All these problems indicate that reform is needed in order to avoid ecological disaster, to restore durable and long-term growth, which would provide means for a completely free way of living, for everybody. We are tired of hearing authoritarian men and women, in any country, who declaratively offer diagnosis and formulas on what to do, and afterwards they justify themselves, saying it is not time for changes because of the crisis, etc., and they are doing all that only because of the popularity or unpopularity... It's scary how much there is – especially among people who make decisions – cynicism, narcissism, self-sufficiency, egoism, egocentrism, self-centeredness, greed, narrow-mindedness, unfounded pride, and irresponsibility in everything that is not part of their personal interests. In the future, all this is to be expected from them and alike. Therefore, do not wait any longer, but change your way of thinking and your attitude.

It remains to take power over your life, to act independently from the hypothetical actions of others. Our people usually say: *One is never served so well as by oneself. If you want to do it right, do it yourself!*

Of course, the freedom you won for yourself can never be unlimited: our life takes place within some kind of prison, in "The Damned Yard", enclosed by the circumstances of life and the inevitability of death. It is ours to expand the walls of this prison. Some authors compare this freedom with the harvest: the harvest depends on the farmer's work, as much as the rain and fertility of arable land.

To make a choice is not easy. But the most capable among us have always made choices. Hence, the choice "relies" on the strength of individuals who have always pulled forward; people have always had the holy spirit of creativity, despite the fact of being *a lone straw tossed amid the whirlwinds*. Everyone has the potential for the path of creativity. This is possible even in Montenegro. Because, despite all the threats and dangers that are obvious, there are also endless possibilities and extraordinary power. Similar to the time of Renaissance, technologies are innovative and powerful, more than ever. Particularly strong is desire for freedom, which has always been the main historic drive, in all areas of life: political, economic, social, scientific, ethical, cultural, ideological... Many people daily benefit thanks to choosing independence, and acting proactively. (Such examples will be shown in this book.) It's not only the benefit for individual, but also for others, for society and its progress. Therefore, the best instrument for economy growth and development is an individual! A person who believes in his abilities and who chooses his way in order to apply these abilities!

If you find all this pretty simple, harmonious, without conflict, without change... then you are certainly in a state of *mental laziness*. Orhan Pamuk called it *exhausting ease*. That means that you have lost your penchant for curiosity, and you no longer try to change your way of thinking; your conceptual world has atrophied and you lack vision. A vision is the practical side of our minds! The practicality of mind, as the hand is a practical part of the body! Desire is not sufficient, therefore we must have a vision of what we intend to do. There is no instant formula, but solution can be reached in two directions:

1. **To be aware of the problem and not avoid waiting for a self-resolution, and**

2. **To search and discover some new or, at least, different processes in the way of thinking, which will dynamically seek for a solution.** Like when you spill water, and then it starts making its own path! Thus begins the process. Where will the water go, how far will it reach, we do not know. But exploring the factors that act during its path will provide an answer.

Why not? Why wait for the others to determine your fate? Why not act, here and now? However, in order to answer these questions, it is necessary to respond to a number of other sub-questions: How to eliminate various forms of modern alienation - material, financial, cultural, ethical, technological, and other? What are the "inner places" where you can find strength for a change, and reason to wake up from lethargy and pull ourselves out of the shackles of everyday life and routine? Obtain strength to start your own business, and stop working for someone else's company or the state? Do you have enough patience to discover your own skills and talents? How to confront the hope that others will take care of your life?

These issues will be analyzed in the following chapters.

How is your thinking these days? Is it comprehensive or systematic? Systematic means whole: total, full, complete, integral, thorough, cumulative, solid. The world is a set of elements in interaction (i.e. the system - the whole - of elements that are interdependent). Let us start with that, and understand the world as a complex whole, linked with million connections. Our knowledge of the world is based on overall, therefore - systematic research - not on a partial observation or analysis of individual phenomena.

Systematic research generally involves:

- Identifying a whole;
- Identifying and understanding of interdependencies within a single whole;
- Identifying interlinkages between our decisions and the results achieved;
- Understanding the possibilities of simplification, and
- Acknowledging the level of our thought fragmentation.

Language is an excellent tool of communication, but as such, it allows to us just enough to exchange information, and to describe our knowledge and experiences – therefore, we understand the reality only in

parts, not as a whole. We need a language of holism, a system language, which should allow us to comprehensively see our reality! Systematic approach means approach from multiple dimensions. Opposite of that is an analytical approach, which may be very detailed and accurate, however, it implies only one dimension.

This book is dedicated to the development of critical and creative spirit, taking into account various dimensions of certain phenomena (holism).

Holism includes both observation of the conceptual and the physical world. When analyzing the ideas that changed the world, we think about the size of human mind, since the human mind generates the thoughts. The survival of some idea or its acceptance is not easy, because every new idea changes the previous one (old, known), and most people usually do not want that. Unfortunately, the old idea works against the new idea. There are countless examples of this. We know that many holders of great ideas were banished, punished or forced to live and die in poverty (e.g. **Galileo Galilei**, **Martin Luther**, **W. A. Mozart**...). **Einstein** said a magnificent truth: *Great spirits have always encountered opposition from mediocre minds*. His creative path is the best proof of that.

Have you ever thought about the ideas that changed the world? Do you recognize them? For example, the idea of: trading, agriculture, timekeeping, science in general, state, king (ruler), marriage, equality, people, pyramid, immortality, freedom, rationalism, numbers, atoms, positivity, capitalism, legalism (of law), republic, slavery, enlightenment, church, knighthood, free markets, mercantilism, protectionism, rights, global governance, prosperity, democracy, socialism, utilitarianism, superman, universal man, relativity, chaos (of unpredictability), fascism, individualism, collectivism, pragmatism, spontaneous order (Hayek), Christianity, Buddhism, money, state contracts (agreements), quanta, nationalism, feminism, conservatism, liberalism, supremacy of the will (Nietzsche), small world (Njegos), more races, Jesus Christ, prayer and salvation, good and beautiful (ancient Greeks), circles of creation, gravity ...?

(Ideas that were great enough to change the world are nicely elaborated by **Felipe Fernandez Armesto** in his book *Ideas that changed the world*.)

Which idea can be singled out as the most influential? It is impossible to say, since every idea can be approached from different

aspects, from different needs and, in addition, every idea can be interpreted differently. For example, **Jesus Christ** was the greatest man of the Western world, at least for me and many others. Christ has invented religion (about) love; therefore, he was, religiously and ontologically, the most revolutionary man of human era. He has set love as the foundation of human existence, and made a human very dependent of it.

Jesus Christ used Moses's idea to proclaim an unattainable postulate for human life: ***Thou shalt love thy neighbor as thyself!*** Nothing so grand, so significant and unrealizable has ever been spoken, or commanded by a man! Jesus Christ has offered another important universal idea to his friends, followers and disciples – ***hope***. A belief in eternal life, the afterlife in heaven – under condition that they live by his principles, to suffer evil without resistance, and to respond with good to evil! And because of that Jesus Christ is God. With his impossible demands, he has awakened in people an aspiration for good, honest, timeless. He has made people better than they were or what they could be.

In any case, the size of Jesus Christ arose from the *clash of ideas*: old ideas of sacrifice and new ideas of prayer and salvation (appeasement of God by sacrificing eg. a lamb, as opposed to direct talks with God, prayers for forgiveness). The idea of prayer also has a practical aspect - avoiding the cost of sacrifice, and all of that, in fact, indicate the different perceptions of the same ideas.

The above consideration shows that the idea is the basis for development of an individual and a society. It is also the foundation for developing economy and business, entrepreneurship, and creative economy. An idea allows each individual to gain control of his life.

Let us not forget the ideas that are powerful but negative. Negative ideas usually arise when abandoning the original ideas. Those ideas are, for various reasons, distorted and deformed from the original purpose and intent. Negative ideas, therefore, reflect influences different from the original idea. Here is an example: let us remember the origin of ideologies. The ideology was born in the French Revolution, when people came to the historical scene. The people, not the king (God's emissary), became the initiators of history through revolution - and there was a need for ideology as a rational and moral force in order to organize and direct those people taking part in historical events. In 1796, **Destutt de Tracy** gave a lecture *The Ideology Project*, where he suggested systematizing and adjusting of

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philosophy for the sake of its practical application in revolutionary change of order. Destutt de Tracy belonged to the first group of philosophers who have been renamed into ideologists. He have reorganized the philosophical thoughts of Bacon, Locke, Voltaire, Helvetius, and Kant into the theory of theories or "science of ideas". This was the birth of ideology; the 19th century was ruled by it, and in the 20th century it dominated the two totalitarian social systems: the Nazi and communist.

When philosophy becomes a world order, social engineering and standardization of human consciousness, it becomes an ideology. It thus reduces the philosophy and theory, and restricts freedom by imposing the objective and tools: it translates ideas into application area. Ideology is not only a product of philosophy. It may have different roots (ethnic, religious, patriotic, economic, environmental, technocratic...), but with applying the standardization of human consciousness it becomes an ideology. Ideology is an expression and product of society, environment, and general culture in which it arises, but also a product of time. Therefore it is possible to nationally differentiate it: French - **Montesquieu, Montaigne, Rousseau, Voltaire**; German - **Kant, Hegel, Fichte, Schopenhauer Nietzsche**; British - **Bacon, Locke, Hobbes, Mill, Smith...** The ideological societies are societies where ideology subordinates and standardizes the consciousness, political culture, art, science, human life, and creativity. Deeper interpretation of ideology can be found in the book *A Major Milestone* by Zinoviev (translated by Vladimir Dimitrijevic).

3. WISE MEN ABOUT THEIR OWN CHOICE?

The wise men of Anatolia, Attica and the Peloponnese, which we call the **Ancient Greeks** had different philosophical views on the capacity and power of man to choose his destiny on Earth, without explicit reference to the immortality, which was reserved only for gods. The Greeks were a very small nation who laid the foundations of European civilization. Words like "politics" and "democracy", "economy" and "history", "biology" and "physics", "mathematics" and "logic", "theology" and "philosophy", "ethics" and "psychology", "theory" and "methods", "idea" and "system", all originate from Greeks, and all are still current (modern) and related to the understanding of human society and creation.

For the old Greeks, as for the most previous cosmologists, one can not escape the path that set by God. In case of avoidance, tragic things can happen. To evade this, there was no other choice but to seek harmony with the universe. And yet, this does not always guarantee success. **Oedipus**, who did everything to avoid killing his own father and marrying his mother (as forced by a prophecy), at the end - because of his fate – he finally did it, unknowingly.

Theseus, who strived more than everybody to choose his own path, inherited courage, the greatest virtue, from his father, the king of the **Aegean**. Driven by the desire to prove it to his parents, he decided to kill the monster **Minotaur**. He went to Crete in Labyrinth to liberate the city of Athens from the curse, that is, from the monsters fed with people. But, since nobody had ever come alive out of the Labyrinth, the whole Athens feared that Theseus's intention was a path to certain death. As a sign of mourning, the sails of the ship on which Theseus sailed to Crete were black. Aegean sent off his son with a request: If he survives, to spread white sails. Thus, when father sees a ship on the high seas, he would know whether his son was alive or not. When Theseus arrived in Crete, Minos's daughter Ariadne

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fell in love with him at first sight and decided to help him kill the Minotaur. Theseus succeeded. However, on returning to Athens, he forgot to replace the sails. King Aegeus saw black sails and thought that his son had died. Mad with grief, he threw himself from the cliffs into the sea. Since then, the sea that washes the Greek coast is called the Aegean Sea. Thus, Theseus unwittingly caused the death of his father.

The evolution of Greek thought has been directed to seeking freedom with limits set by God. Greek thinkers have embraced the idea of freedom, already present among Jews. Greeks began to question themselves in order to discover and select their own fate. A real example is Ulysses, who wandered between war and peace, love and hate, chaos and harmony, exile and return to himself, bad and good life. He refused immortality, suggested by Calypso; he returned to Ithaca and carried out his revenge against the people who occupied his palace. "Peace of heart!" has written Homer in the *Odyssey* (Book XX). According to that, an inner dialogue and self-cognition are essential influence on the action.

A little later, in the 6th century BC, Heraclitus of Ephesus (540-480 BC) also considered getting to know himself better, as a condition for achieving freedom and wisdom and resources for self-creation. In his *Fragments*, he regarded himself as self-taught (B101). Then, he explained how doctrine allowed us to achieve through *the truth and acting knowingly in accordance with nature* (B112) He also said: *All men have a share in self-knowing and sound thinking* (B116). His wise words were: *Only the wise man can obtain knowledge.*

According to Epicureans and Stoics, a man for his choice must, above all, to understand what does not depend on him, but all the better must he act on what depends on his actions. Unlike animals, man has the ability to plan his life, and to make a *calculation of satisfaction*. According to Epicurus (341-270 BC), satisfaction is not just sensual pleasure but also friendship and art. Epicureans valued the ancient Greek ideals of art, restraint and peace of mind. Epicurus said: *Death does not concern us, because as long as we exist, death is not here; and when it does come, we no longer exist.* As in Buddhism, Epicurus's contemporary Diogenes added that the real choice is asceticism - renunciation of social conventions and basic comfort to achieve freedom. According to him, *freedom is an ideal of complete individual self-sufficiency, a condition of the absence of need, or the reduction of need towards an absolute minimum.* A legend has it that

Diogenes lived in a barrel, he owned nothing but a cloak, a stick and a bread bag. While once basked in front of his barrel, he was visited by Alexander the Great. The monarch addressed him with greetings and asked if he wanted anything. "Yes," said Diogenes replied, "stand out of my sunlight."

Man is the measure of all things, said sophist Pythagoras (487-420 BC).

For **Socrates** (427-347 BC), contemporary of Diogenes, taking your life into your hands, above all, is *to know yourself*. It is a "formula" that he pointed out, repeating an inscription that stood at the entrance to the Temple of Apollo at Delphi. Socrates thought it was important to discover the basis of knowledge. He believed that he had found this basis in the human sense. *If the one knows what is good, the one will always act in such manner* - he said. Socrates believed that true knowledge leads to proper work, and *the goal of righteous is nothing more than to do the right action*. When we act wrongly, it is because we do not know better. Therefore, it is important to increase knowledge. Socrates also states that it is impossible to be happy if acting against your own beliefs. In the process of finding your own way, Socrates is an example to everyone, because he managed to free himself from the established views of his time, using his reason and his mind.

Plato was, as I said, on the trail of Socrates' thinking. Self-knowing for him primarily meant understanding his own limitations and his own place in the world. According to him, the soul becomes free on the basis of researching our inner world (infinity), which is both in us, and in contact with eternity and divinity. He wrote in *Timee* (90 b-c): *If a man devote himself entirely to scientific pursuits and true wisdom, which he will, according to his abilities, practice by thinking about things immortal and divine, he will reach the truth, and certainly, to the extent given to the human nature, will participate in immortality and nothing will stop him to achieve that.*

Aristotle also believed that independence is possible. For everyone who is allowed to avoid tragic fate, there is a possibility to find harmony with universe and spiritual life. The only way to achieve perfect happiness is to escape in the spiritual sphere. In *Nicomachean Ethics* he wrote: *A man ought not to follow the advice of those who say that as a man one should think like a man, or as a mortal, but as far as is possible to aspire to be immortal, and to do everything towards living according to best and highest of the faculties in him.* According to Aristotle, man can only achieve

happiness by using his abilities and capabilities. Aristotle believes that there are three types of happiness: 1. life of pleasure and enjoyment, 2. life of a free and responsible citizen, and 3. life as a thinker and philosopher. All three conditions must be met so the man could be truly happy. Body and mind are equally important!

For Christians, at the crossroads of Judaism and Greek thought, people are **free to choose** between good and evil; They choose whether to follow the salvation offered by God and those who follow his words on Earth. Also, the only thing a man should seek for itself is *salvation*, in other words - to be resurrected. It all began when God created the world. The Bible tells us how it all happened. But people have rebelled against God. The penalty for this was not only the banishment of Adam and Eve from the Garden of Eden. Death came into the world. In the Bible we learn that God made a covenant with Abraham and his descendants. With that covenant, that agreement, Abraham and his descendants were obliged to respect God's commandments. In return, God promised to protect Abraham's descendants. *If you continue in My word, then you are truly disciples of Mine, and you will know the truth, and the truth will set you free* (John 8:31). **Paul of Tarsus** to Romans said: *For the wages of sin is death, but the free gift of God is the eternal life in Christ Jesus our Lord.* (Romans 6:16) This is achieved through baptism: *Realising that our former self was crucified with him, so that the self which belonged to sin should be destroyed and we should be freed from the slavery of sin.* (John, chapter 6). The essential message is the justification by faith, not by deed according to the law. This justification obtains forgiveness of sins, thus justice before God is achieved. All are under the sin. And Jews and Gentiles. However, it is not enough just to believe and do nothing, but to live and do good deeds in accordance with the new Christian principles. By living so, with faith in Christ, whose death gave us justification for forgiveness of sins, we are entitled to hope for salvation. The final form of salvation we gain on the Last Judgment (John, chapter 16). Exemption from sin leads to belief, not only in the hope of resurrection, but also the life in the *Holy Spirit*, which helps us to achieve superiority over the desires ... *If by the Spirit you are putting to death the deeds of the body, you will live. For all who are being led by the Spirit of God, these are sons of God.* (Romans 8:14), that is, immortal. Paul says, *a man is not justified by the works of the Law but through faith in Christ Jesus, but the faith of Jesus Christ* (Galatians 2:16).

Somewhat later, discussions on this subject exceeded authority of the church. **Pelagius** (350-420) opposed the idea of predestination, and created a strong version of the **free will doctrine**. He was charged by Augustine of Hippo for denying the need for the divine help in performing good deeds. Pelagius denied Augustine's theory of sin, opposing it a doctrine of free will. People will not be punished for the sin of Adam, and are perfectly able to fulfill the laws without the divine help. Unlike Pelagius, Augustine of Hippo believed that man cannot be saved without the grace of God, since the free will of man is lessened by the original sin. Evil is the result of human disobedience, thought Augustine. His words were: *Good will is an act of God, evil will has left the act of God*. Augustine's opinion prevailed so that, for the church, no work of man himself was not sufficient for salvation. Other categories in the life of man, for example: ownership, possession, property, etc., had a special treatment. It was believed that wealth is not enough for salvation, while poverty, as a major human temptation, provided salvation to some extent, but it did not guarantee it. In other words: choosing material freedom closes the door of salvation. However, Augustine did not dismiss the man's responsibility for his own life. According to him, we should live with constant perception that we are responsible for the Salvation. Still, he does not deny that we have free will. Yet God *predicts* how we are going to live.

This debate about the freedom of man is differently explained in **Islam**. According to Islam, a man can choose freedom, because God has given us independence and holds us responsible. Since God, as omniscient, sees the past, present and future, man has none of these abilities. A man only knows what is good and what is evil, and he can choose between those two. *Allah says: Indeed, We guided him (man) to the way, be he grateful or ungrateful* (Qur'an, 76:3). *And We have shown him (man) the two ways (good and evil)*. (Qur'an, 90:10).

Thanks to the abilities of mind, capacities of knowledge, and freedom that God has given, people can learn to understand things and make decisions, but not always in the best way. Only the one who does good deeds and who obeys the Qur'an will go to *jannah* (heaven). A significant role has the soul and the one who created it. *And inspired it (with) what is wrong for it and (what is) right for it. To a happy state shall indeed attain he who causes this (self) to grow in purity (Zakaha), and truly lost is he who buries it (in darkness)*. (Qur'an, 91:8).

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The debate over the ability of man to choose his fate did not cease. On the contrary, it has intensified with the growing desire of man to take a multiple power over their own life, for example - to refuse an arranged marriage and the like.

Among the first were the merchants of Flanders and Italy, who refused to continue to believe that their fate on Earth entirely in the hands of God and the Church. They did not want to accept that only poverty guaranteed Salvation. They knew that entrepreneurship could change their livelihoods and they believed that wealth was not a hindrance to Salvation. Faced with these notions, Catholic theologians strongly advocated the belief that the destiny of man did not depend on him, but on God, and that only the poor would earn eternal life. **Cornelius Jansen** (1585-1638), a bishop of Netherlands, says that salvation depends only on its Creator. He repeats that poverty and asceticism are life forms which preserve the *grace* the most effectively.

In the same direction, **Blaise Pascal** (1623-1662) has discovered belief in a mystical experience of enlightenment. In 1650, he left the world of science and devoted himself to researching the size and the mystery of man. His ideas were compiled into a philosophical work *The Thoughts*, and his relationship with God he formulated this way: *If God does not actually exist, such a person will have only a finite loss, whereas they stand to receive infinite gains (some pleasures, luxury, etc.) and avoid infinite losses (eternity in Hell)*. He claims that **self-knowledge is not a realization of desires but awareness of the distinction between good and evil**. According to him, humans long for happiness, but God is the sole source of happiness and truth. There is enough light for those who want to see it, and also the darkness for those on the opposite side. He said: *To know is not to be. What is learned must be put into practice of everyday life. If we want to succeed in this world, we must possess self-confidence, and then self-sacrifice. Hence: He who seeks the meaning of life in the spiritual training, can not be unhappy, because what he wants is always in his power.*

Also well known is Pascal's theory of belief in God, which actually shows his view of choice, and that is: It is better to believe that God exists; it is better to believe in something, rather than not to believe at all. Pascal, therefore, gives only two options: to believe or not to believe. This raises following possibilities:

- You believe in God

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- If God exists, after death you go to Heaven, which means you have endless gains.
- If God does not exist, you lose; your loss is finite and therefore negligible.
- You do not believe in God
 - If God exists, you go to hell; your loss is endless.
 - If God does not exist, your gain is finite and therefore negligible.

With these options and considerations, Pascal hoped to conclusively prove that the only sensible solution for a man is to believe in God. Pascal also hoped, if he failed to convert the infidels into Christians, to at least showed them the purpose, value and necessity of considering the option of God's existence.

Contrary to the previous views, some theologians of the same epoch, tend to prove the position that material wealth does not interfere with achieving the Redemption. In 1530, **John Calvin** of Geneva says that God saves man independent of his will and the life he leads. The rebel of Rome, theologian **Martin Luther** at that period of time writes his book *Freedom of a Christian*, and says: *Good works do not make a man good, but a good man does good works*. In other words: Good act, especially material success that derived from it, is a sign of God's will, not the result of the same act.

Renaissance led to a new relation, both towards God and towards man. Gradually, the philosophy and science separated from theology, so Renaissance brought a new, individualistic vision of man. Parallely with Renaissance began a Reformation of the Church. A significant representative of the Reformation was Martin Luther. According to Luther, a man does not need the Church, nor forgiveness, nor priests, to deserve salvation. The *Bible* is available to every individual, because it is translated into the dominant European languages, Luther has translated it into German, so that every man could read it and to be the priest of his own. This way, Christianity has received a significant, major role in the development of individualism, instead of universalism. And the very act of confession is individual.

The Jesuits, led by Spaniard **Luis de Molina**, go further in affirming the view that good deeds provide salvation, whereby the material wealth it does not interfere. He assumes that man is free to perform an action and that God always give mercy to those who sincerely seek for it.

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Thinkers inside and outside the Church gradually affirm the right to live happy on Earth and after death. (However, the right to choose a spouse, or, say, a profession, remained exclusively the right of fathers.)

Etienne de la Boetie (1530-1563) in his book *The Discourse on Voluntary Servitude* (*Discours de la servitude volontaire*, 1549), who was at the time only eighteen years old, writes that the man primarily wants to be freed, and tends to tear out of humilition. If he fails, then he more or less tacitly chooses his fate, which is, in fact, the acceptance with some measure of obedience... He asks questions: Why so many people, so many villages and towns and so many nations, tolerate one single tyrant (usually), although he has the power and authority given by them? How is it possible when a tyrant has only as much authority as they are willing to give him, or - willing to bear? How, when he can do just as much harm as they are ready to suffer, without offering resistance? *Where has he acquired enough eyes to spy upon you, if you do not provide them yourselves? How can he have so many arms to beat you with, if he does not borrow them from you? The feet that trample down your cities, where does he get them if they are not your own? How would he dare assail you if he had no cooperation from you? Resolve to serve no more, and you are at once freed.* The choice of obedience to him is also a form of "self-reliance".

His friend **Michel de Montaigne** (1533-1592) starts from Socrates' view that the unexamined life is not worth living. According to Montaigne, the essence of human nature is that it is not defined, nor still. He represented humanistic efforts of the 15th century. His greatest work, *Essays*, was focused on the author himself, imbued with the general principles of the philosophy and the author's own thoughts. Montaigne began writing *Essays* in 1571, when he was 39 years of age. According to Lanson, they differ by their elements: thoughts about the read books, reflections on observing the life of others, and regarding himself.

Although this work treats extensive material, it obeys the Montaigne's views on the value of the ancient heritage and wisdom of various thinkers. It is summed into illustration of individual human thought, whose primacy of rule is common sense. The most important is that Montaigne, writing about himself, writes about man in general – he lends us his eyes so we could see ourselves. For him, every man carries a form of human nature. His literature is ancient heritage: Plutarch, Seneca, Ovid, Virgil, Plautus, Herodotus, Xenophon, Titus Livius, Caesar and Cicero.

Quoting them, he follows the signs of that time. However, unlike his contemporaries, Montaigne has assimilated the ancient culture. He cites the views of others for better illumination of his own thought. For Montaigne, "borrowing" other people's thoughts and sentences is not an imitation, nor theft. As the bees process honey, he "processes" the works of his role models to present his own views.

With his method and harsh criticism, Montaigne, as well as his older compatriot **François Rabelais**, criticizes the scholastic medieval education. Knowledge, according to him, must never become dead capital, nor to be exclusively literal knowledge. The process of thinking is what brings us to the perfection of virtue. Erudition, wisdom and knowledge have no true meaning if they do not encourage the creation in us. As Rabelais, Montaigne criticizes educational system of their time because it lacks proper development of intelligence, insisting on banal memorization of different content. (We certainly recognize this in modern education systems and processes.) Montaigne exposes his vision: education is the harmonious and parallel development of the whole personality (spiritually, physically and morally). Developing the spirit involves strengthening and developing the intelligence. Good and smart head is appreciated, and that is achieved through discussions, acquaintances and travel. Education must be non-violent, a student must be an active participant in this process, constantly applying his own knowledge. The student should not only believe in authority, he must think critically. This system resembles the Rabelais's, except that Rabelais, however, acknowledges encyclopedic knowledge (i.e. the widest possible knowledge of the students which will make the entire reservoir of knowledge), while Montaigne prefers the development of intelligence and discernment.

Development of Montaigne's philosophical thought distinguishes three phases: stoicism, skepticism, and phase of life wisdom.

1. Stoicism (Philosophy of death) - is present in the first, and partly in the second book published in 1580, with main subject on preparation for pain and death. Ideal life in this period of asceticism in the ancient example, particularly the example of Cato the Younger. His favorite teacher was Seneca. Montaigne here develops the theory of will power, which must win pain and

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death. Life wisdom at this stage is to prepare for death, which is our destiny.

2. Skepticism - Expressing doubts about the question: What do I (actually) know?, is systematically implemented in the largest and most important essay *An Apology for Raymond Sebond*. Here are illuminated the misconceptions of senses and reason, and science is subjected to criticism, as well as scientific and non-scientific methods, then metaphysics, as a mother of mysticism, also the limits of human knowledge, philosophy, which is just a set of contradictions, as well as vanity of the life resembling to a dream...
3. Life skills (Philosophy of life) - reaction, revolt against scholasticism – opposes the scholastic denial of life, and assumption that earthly life is only to preparation for another one. On the contrary, earthly life here becomes its own aim, or worth of living. Life must be used as it was given to us, and from it we must draw as much happiness as possible. This should be done by relying on nature.

A century later, after **Shakespeare**, **Moliere** and **Marveaux**, the enlightenment of young people, boys and girls, is completed. **Jean Jacques Rousseau** (1712-1778) has described the path that he himself followed in his book *The Third Walk* (Troisieme promenade), but also in his other works. According to him, to be yourself can be a virtue, except for those who rely on their actions and experiences.

I am fully myself and belong fully to myself, without distraction, without obstacle... This was idea for which **Jean-Jaques Rousseau** cared deeply, and which will pave the path where his thoughts will go. To get to know yourself to the limit, to denude your own being to the core, to take off all masks and to reach the primordial content, pure and intact, to knock down all barriers of outer appearance and to find happiness in yourself - this was a goal of Rousseau's journey to the center of one's own spirituality. Rousseau's ideal resembles Plato, when he dreams that his soul, freed from

the body, will look at *a truth without its veil*, as the only relevant and meaningful in relation to the nothingness of human performance. His aim is to remove the veil, to dispel the darkness created by prejudice, and to strive to transparency and innocence. Rousseau is searching for a philosophy for himself, he does not want to teach others, but to learn himself, so the mere knowledge becomes the knowledge of how to live, how to create your own existence in the best possible way, in spite of all the hardships and obstacles that impede peace and tranquility. To live your own philosophy, to discover the laws of your own nature, and to behave and act in accordance to them. Not to learn from books, but from the heart and inner moral sense. It is essential to silence the voice of reason, and to let the sensibility and intuition to speak to ... These are all aspirations of Rousseau.

He believed that contemporary culture is a negation of nature, and therefore he stated that people need to return to natural values, that is, freedom and equality. For Rousseau, inequality arose with private property, such as the state which was created by the social contract. However, according to Jean-Jacques Rousseau, the great educator, an education is the foundation of the entire society.

Democracy and the spirit of entrepreneurship in the next period are becoming the new values in achieving freedom.

In his book *What is Enlightenment?*, **Immanuel Kant** (1724-1804) explains the transition of a man (characteristic for his epoch) from *minority* towards *majority*. For Kant, the real choice is audacity to think and to avoid what authorities (church, state) are presenting as inevitable. His work has profoundly contributed to directing the man towards creativity. Kant's famous quote is: *The starry heavens above me and the moral law within me*. He further says: *For me they are the evidence that God exists above me and the God in me*. According to Kant, only when we comply with the moral law (conscience) we act freely. And that moral principle he calls a **categorical imperative**. Kant has given more definitions of categorical imperative. One of them is: *Act in a way that the rule for your action could be universal*. In addition to this the most general formulation of the moral law, Kant states the following principle: *Treat people as an end, and never as a means to an end!* With this Kant emphasizes a duty of respecting the special dignity of man as an intelligent and free being. According to Kant, the moral goodness of a human act does not follow from the premises (i.e. nothing is good by itself). After all, he believes that we do not even know what are the things

look like in their essence. A **moral good** of an act, according to Kant, follows only out of the **good intention**. The very intention, however, is good only if it comes from duty (i.e. out of respect for the moral law).

He then points out that the desire of man to be free, as an individual, is the ultimate and unique goal, both politically and economically.

Hegel (1770-1831) believes that God is in fact a system of relations in which all things are moving and identifying their being and their meaning. In a man, it absolutely grows into consciousness and becomes an absolute idea - or thought, which receives itself as a part of the absolute, and overcomes individual limitations and measures; it grasps the hidden harmony of things behind the universal struggle. *A mind is a substance of everything, the plan of the universe is absolutely ingenious. And further: Struggle is the law of motion, human character is formed in winds and pressures of life; and man reaches his full greatness only when he passes through the fire of hardship, responsibilities and suffering ... Life is not made for pleasures, but for the endeavour ... History of the world is not a theatre of happiness; Periods of happiness are blank pages in it, because they were periods of harmony, and one such dull satisfaction by himself is not worthy of human dignity... The highest law of politics is freedom.* And in all this, the changes: *a man can change the world through his work.* According to Hegel, one stage of history shows that humanity is moving increasingly towards a rationality and freedom. Despite all the delays, historical development is moving forward. We say that the history is surpassing itself or that is *purposeful*. According to him, history resembles a long chain of thought. Hegel has also established certain rules related to that chain. Every idea is formed on the basis of other ideas, created earlier. As soon as thought is expressed, a new idea is opposed to it. Thus occurs the conflict of ideas, which is a basis for dialectic development. I would say that, according to Hegel, the conflict of ideas is the basis of creation.

Later, when agriculture and feudalism gave way to industry and capitalism, market and democracy, the tendency *to become independent* has taken a new dimension. For **Karl Marx** (1818-1883), it means freedom from alienation and exploitation. This implies a need for two revolutions: personal and collective. In his *Manuscripts* (1844), Marx describes the alienation of workers, because their work is not a *leisure activity*, nor physical, nor intellectual, but coercion, imposed and humiliating.

Search for achieving individual freedom to make decisions and to create, continued with the theory of psychoanalysis, founded by **Sigmund Freud** (1856-1939) at the end of the 19th century, created to help people set free from alienation. Alienation is a result of the struggle of the unconscious, since the physical space of a man contains repressed desires, socially prohibited, and censored by a man. Such conflicts can lead to neurosis, where the neurosis is *a part of me that is suppressed (instinctive life)*, and the psyche is *a part of me that is put to the service which removes a fragment of reality*, and that paralyzes man. To resolve such contradictions, the analyst is invited to help pronounce – to express without restraint - the thoughts that pass through the patient's head. According to psychoanalysis, this is the way to expose the foundation of problems, or the content of the unconscious, as well as the thoughts and actions that are disturbed. This session allows to uncover the past, the burden of heritage and, in most cases, to cleanse the neuroses and replace them with normal feelings.

For **Marcel Proust** (1871-1922), writing is an instrument of liberation. Writing serves to discover life and the world, and allows to correct the past. His novel *In search of lost time (A la recherche du temps perdu)* is an example, according to Ronald Barthès, of *the story about the desire to write*. The novel has a form of essayist memoirs: it is, in fact, the quasi-autobiography, linked by fictional and meticulous parsing, in which all elements have been taken from reality, but stylized in terms of Proust's philosophy and aesthetics, in symbolic and impressionistic spirit of that time. At the end, Proust writes about the role of introspection in the process of finding self. *Finally, these ideas of a time have a special value for me: they were an incentive, they tell me what the weather was, what I was waiting for, what I achieved and felt in my lifetime; all returns in short bursts, inspiring me to treat life as a worthy experience.*

In the light of Freud's doctrine, **Carl Gustav Jung** (1875-1961) in personality psychology distinguishes *I* and *He*. *I* gets in the center of consciousness, and it is overrated in the culture of Western man, who seeks only a reasonable being. *I* involves conscious and unconscious, regrouping the personality of a man. The goal of life is to achieve harmony between the conscious and the unconscious, that is, to achieve the harmony within *I*. According to Jung, personality develops throughout life, with an emphasis on spiritual development in the second half of life, when personality focus shifts from *I* to the *Self*. This time, the spontaneous self-development and

Wise men about their own choice

self-completion, where person encounters his Persona, Shadow, Anima/Animus and mana-personality, Jung calls individualization. Personality is a self-regulatory system, and it develops through the mechanism of compensation, which continually strives for more balance.

For **Peter F. Drucker** (1909-2005), the question – *By what will you be remembered?* - was the question that brings self-renewal in life. He continuously asked himself this question throughout his life. Drucker was very modest and effective; he has written more than thirty extraordinary works and countless contributions to the most reputable media, such as *The Wall Street Journal*, *Harvard Business Review*, and *The Economist* magazines.

Drucker was very impressed by Verdi – he was especially fascinated by Verdi's explanation of why he composed his last opera *Falsafah* at the age of eighty: *All my life as a musician, I have striven for perfection. It was always eluding me. I surely had an obligation to make one more try.* Drucker said: *I have never forgotten these words – they made an indelible impression on me. Verdi, when he was my age, eighteen, was of course already a seasoned composer. I had no idea what I would become... It was not until fifteen years later, when I was in my early thirties, that I really knew what I was good at and where I belonged. But then I resolved that, whatever my life's work would be, Verdi's words would be my lodestar. I then resolved that if I ever reached an advanced age, I would not give up, but would keep on. In the meantime, I would strive for perfection, even though, as I knew well, it would surely always elude me.*

4. ENERGY OF CREATION (DIALECTIC OF IDEAS)

All things have source, so the process of analysis begins from the roots, not from the middle! The root of the creation is a word, a thought, an idea! The root of all things is the idea of creation! You recognized my goal, dedicated to conveying the idea of creation, which is, as **Maslow** has proved, in our nature. Creativity has its ladder that we use for climbing up to the top, where we can reach the highest level - self-actualization. This way up is not always sunny and light, on the contrary – there are days and situations of peace and war, equally in the nature and society, as well as in our soul. War and peace of the soul are both in changes and processes of transformation. War and peace in nature, even in the soul, is a dialectical process that characterizes the confrontation of ideas and changes. From the turmoil of the soul erupt creation, or the processes and dynamics. Its dynamics is manifested in their antinomies, for example: day-night, black-white, reality-dream, health-illness, love-hatred... We actually live in a world of opposites: up and down, light and dark, hot and cold, fast and slow, right and left, spirit and matter. One side can not exist without the other and vice versa. Therefore, the phenomena and processes may be visible (external) and invisible (internal). In the creative processes man strives to find out the essence, the meaning of phenomena, objects, words. He searches for the answers on the far side of the essence:

The power of the soul?
Activity or passivity?
Optimism or pessimism?
Non-politicism or engagement?
Superman or universal man?
Goodness or arrogance?
Hamlet or Don Juan?
Don Quixote and Sancho Panza?
Individualism or collectivism?

Energy of creation (dialectic of ideas)

The market or the state?

Does the space turns into time and vice versa?

Does the mass and energy can be converted into each other?

What does the speed of time depend on?

Does the space turns into time with acceleration and vice versa?

What is gravity?

Does the light have a dual nature (wave and particle)?

Does the time pass more slowly with acceleration?

Life on the other planets or stars?

War and peace of the soul bring dissatisfaction. Only dissatisfaction with oneself brings *epiphany* - inspiration. That is what emerges from our heart and soul, and has deep roots.

When this war and peace begins in a man? It is in our nature and that is why Njegoš states: *True happiness remains unknown to man, in this his stormy temporal abode, its limits and its measures he ignores, although foreber he pursues its shade: The more to glory's summit he ascends, the more he grows the foe of happiness... Who will indicate the limit of wishes.* The Creator had left it inside the human being, because we are born without our knowledge and against our will, thrown into the ocean of existence. *To be obliged to swim, to exist; to have an identity; to resist the pressure and shock from the unforeseen and unforeseeable acts - We have to swim. Exist. Wear identity. Support air pressure all around, all collisions, unpredictable and unforeseen actions – one's own and those of others – which so often exceed one's capacities. Above all, to withstand own thought about that. Above that, to withhold the thoughts about all this.* (I. Andric)

When a child is born, its senses are brought in contact with the outer world.

The waves of sound, heat and light beat upon its feeble body, its sensitive nerve-fibers quiver, muscle contract and relax in obedience: a gasp, a breath, and this act a marvelous little engine, of inconceivable delicacy and complexity of construction, unlike any on earth, is hitched to the wheel-work of the Universe.

The engine labours and grows, performs more and more involved operations, becoms sensitive to ever subtler influences and there manifests itself in the fully developed being – Man – a desire mysterious, insscrutable and irresistible: to imitate nature, to create, to work himself the wonders he perceives. (Nikola Tesla)

Human nature has been researched by many scientists and is a subject to most religions, therefore it is interpreted differently. Generally, the most frequent question is: Where comes the discontent in human nature and why? However, people strive for health and strength, seek knowledge and property, build houses and palaces. Yet, despite all achievements, they are never satisfied. Those who live in poverty dream of riches. Those who have one million, want 2 millions. Those who have 2 millions, want 4. Even the rich and famous are rarely happy. They are haunted by constant worries and doubts, till the end. Life is a race; Is it meaningless? In Buddhism, this question is explained by the very nature of man, which is based on desires.

In the age of 21, **Siddhartha Gautama**, tormented by these issues, fled in the middle of the night and left behind his family and everything he had. He traveled as a tramp-homeless through north India, seeking a way out of suffering. He was visiting Ashrams, and sitting under the feet of gurus, but nothing could liberate him completely - a certain dissatisfaction was always there. But he did not fall into despair. He decided to tempt suffering over himself, until he found a method of total liberation. Gautama spent six years meditating on the essence, causes and cures for human torture. Finally, he learned that suffering is not caused by misfortune, social injustice or God's will. He concluded that suffering was caused by the behavioral pattern of human mind.

According to Gautama, regardless of what the mind has experienced, it usually reacts with craving, and craving always means dissatisfaction. When human mind experiences something pleasant, it longs to extend or enhance that pleasure. Therefore, the mind is always dissatisfied and restless. This can be manifested very clearly when we experience something unpleasant, such as pain. As long as the pain lasts, we are unhappy and we do everything in our power to cease the pain. However, when we experience something pleasant, we are never satisfied, because we either fear that pleasure will disappear, or we hope that it will become more intense and last longer. People dream to find love, but they are rarely happy when they find it. Some are afraid that the partner will abandoned them, others feel unnecessarily trapped, thinking that they could find someone better. We all know people who have managed to achieve both. Obviously, this form of suffering and eternal chase for the greater pleasure has always been present in human mind as a result of human mindset.

Gautama has found a way to free himself from desire and to attain nirvana using techniques of meditation and concentration focused on the present moment. When one puts out the fire of desire for anything (sensual pleasures, wealth, health...) one achieves nirvana (a Sanskrit word meaning „putting out the fire“). Therefore, Siddhartha Gautama was known as Buddha, or Enlightened One. Buddhism as one of the greatest ideas of mankind, came from the macrocosm.

To reiterate the former statement: the human nature has a tendency to improve its mechanisms and forms - which are used at a given moment - so the existing being could be improved or completely replaced by qualitatively new. This dissatisfaction with existing, and constant striving, even longing, for something fundamentally different, and - at least in the domain of hope and hypothetically speaking - for something far better, something permanent, is a characteristic behavior in all areas of social action. It is, as I perceive it, related to human duality - the ability to create ideas and the ability to realize them. Dissatisfaction with the existing state of affairs, and craving for something new and better, created in the preliminary telescope of future, is the cause of tensions, which often lead to changes. Just a cursory glance at our recent past shows the continuity of dissatisfaction and discontent that follow changes, which are not always positive. A little further in the past (period before the Second World War), was marked by dissatisfaction in the market and the regime based on a private property. Some of the most talented students and proven intellectuals have supported the Communist Party, which had a revolutionary upheaval and the abolition of private property in its programme. After the victory of socialism, we became dissatisfied with it, especially in its advanced stage (in centralized and also in decentralized countries), and then we were unhappy with the first steps of transition to capitalism...

Philosophy of change in the way of thinking, which is advocated by this book, implies evolvability of change, without leaps in the development. Revolutionary leaps in the development of individuals and society carry a huge risk and do not provide a continuity of development, but often causes relative decline. Of course, striving for changes is a generator of change, but the hazard of revolutionary changes is huge and the result of their consequences is often negative. Initial conceptual scheme is often wrong, therefore the calculations are rarely rational. But even if possible, there's no time for those calculations, because revolutions, as social movements,

usually have a form of social fractures and upheavals. Evolutionary changes allow different correction, the correlation in accordance with an *imaginary model of the future*, and the possibility of wrong conceptions.

The ray of creation and starry sky

Ideas spring from our souls. They are intangible, revealing us the secrets of materialism. They are ray of creation that is taken from the *endeavour fires*. It is the passion, the energy, the unseen power without which human being can not commence. Human mind is a generator of ideas, and, as Njegos said, raises a man to the *level of the immortals*.

Ideas twinkle and sparkle in us as the stars in the sky. However, there is a difference: the countless stars, which from the beginning of the time cover the firmament, are eternal, immutable, imperishable (especially in comparison with man, and even with all the human history). Starry sky can be similar to eternity. But, can it be similar to our soul? Earth has a nearly spherical shape and floats in a huge, celestial sphere. The sphere in which the Earth rotates and is mutually attracted to other spheres, among which are the most typical ones that carry the celestial bodies: the star of Hermes, Aphrodite, Ares, Zeus, Crohn ... Starry sky inspires encourages thinking about the man and the universe.

The sky filled with stars, inspired the people to great deeds. Eg. **Thales of Mile**, who predicted a solar eclipse, and the birthplace of his beautiful city of Miletus, on the island of Samos. Thales introduced mathematical ideas to Pythagoras. Teacher and student raised human mind into a higher world, to a higher level. Human mind does that, regardless of time, location or issues (eg. Njegosh raised Montenegro and Montenegrin epic, ethics and aesthetics to a higher spheres.) They concluded that the Earth floats in the center of the universe and has the shape of a ball (Pythagoras). They took over the ray of creation from Egyptians, Greeks and Chaldeans, adopting their knowledge. Therefore Pythagoras learned Egyptian language and spent several years in Egypt. He saw many things in Egypt, and his mental powers were inspired by the eternal pyramids and the sphinx, which were, as some sort of gods, erected from the plains, more than two thousand years before Pythagoras. The biggest pyramid of Cheops was built for twenty years by at least a hundred thousand workers. A population similar to the whole Montenegro from the era of Njegos. Pyramid was over

152m high, and over 182m wide. It was built of carved limestone and granite, and each stone was five times bigger than average human physique.

The path of insight and knowledge about the universe and a man (the microcosm and the macrocosm) begins with the Ancient Greeks, and the path of knowledge, as Pythagoras said, is endless.

In Egypt, everyday problems in life have developed a practical science: geometry. Flooding of the Nile has created layers of the ground, covering the estate borders, so they had to be remeasured. This situation required that the geometer was the only one able to properly mark the border. Economic necessity has initiated the development of geometry and arithmetic, as well as astronomy. It was important to determine: When the floods will occur? How to predict them? How long will they last?

Egyptians had their own well established calendar, 3,700 years old. According to Egyptian calendar one year has 365 days, constantly. Thousands of years of experience have shown to the Egyptian chronologists that their calculation did not coincide with astronomical phenomena. Year after year, they monitored movement of Sirius (the brightest star of the external celestial sphere), and recorded its first appearance in the sky. They noticed that the date of appearance of the morning star vary from year to year, and calculated that after 1,460 years it comes back to the same place, that is, at the date marked in the calendar. (This was the case, but not with the same mathematical regularity, and with the age of flooding.) These findings brought Egyptian chronology in a close connection with the annual travel of the Earth around the Sun.

Egyptian knowledge of the universe, geometry and mathematics, as well as Egyptian ancient scripts, went through the Pythagorean mind sieve and he gave them his own contribution (eg. he came to the conclusion that square of the hypotenuse (the side opposite the right angle) is equal to the sum of the squares of the other two sides, known as Pythagorean Theorem). He managed to decipher the secret of geometric shapes of Egyptian pyramids. His findings elevated him, and left Egyptian geometry behind.

From this lofty position, he realized that geometry and arithmetic were related, that geometric shapes exhibit numbers, and that these forms are mere embodiment of the numbers. He has "found" the harmony of numbers in the nature, or in the entire universe: the sound of a musical instrument reflects the balance of arithmetic scales on the wire of the instrument, the universe is in harmonious proportions and maintains perfect

order, beautifully expressed by the word cosmos. Harmony of the universe is the language of numbers! The numbers include all!

Democritus took over the ray of creation. He tried to read the letters of the great book of Nature, and sought the truth everywhere, in every place, in all natural phenomena, in the rays of the sun, in the air, on the land and in the sea, in a dead stone and living being. He wondered: What holds, moves and transforms everything? He watched, made experiments and investigated the composition of the world and tissue of the matter. He realized that true reality could be sought only using intellect. Our observation reveals variable, relative and transitory reality, but for our intellect it is unchangeable, absolute reality, equal to itself. He came to the discovery that the overall matter, contained in the universe, whether alive or dead, was built of tiny, invisible particles. Even the simplest experiments can indicate this. A handful of salt, thrown in the water, disappears after stirring, and falls apart into small pieces, not visible to the naked eye. The universe consists of space, atoms and movements. Infinite number of invisible atoms swirls around each other, causing with this constant movement that all natural phenomena remain in a continuous row and their diversity. Nothing happens by chance but everything has its cause and its inevitable consequence! True happiness, in which only the wise man can fully enjoy, pure bliss, the goal of life and its peace, should not be sought in the external goods and sensual pleasures, but in a quiet, silent mood, achieved by the subtle ripple of fine atoms of our souls. The soul hence becomes a master of itself.

Plato opposed to Democritus regarding the case of real knowledge. According to Plato, the real reality is immaterial. Only when things, that we perceive with our senses, are deprived from all of their random and transient forms (stemming from the material of those things), then it leads to their clear vision, the idea (about the given thing), which is unchangeable. For example, the geometrically perfect circular line, which does not exist in the nature, is actually the idea for creating all circles. Pure, lofty ideas of goodness, truth and beauty, are perfect, eternal, unchanging creations of the spirit. They are not of this world; they exist outside of the world which is conceivable or accessible to us. The **ideas**, non-corporeal beings, are introduced through the concepts that define them. Even soul is not composed of atoms, as Democritus thought, but it is immortal and immaterial! (Njegos has poetically explained this view in **The Ray of**

Microcosm.) Thus, according to Plato, the real science is not the study on material world, but the study on ideas.

Aristotle was Plato's apprentice, but despite the enormous respect for his teacher, he created his own works. He analysed everything he learned. His spiritual view introduced two systems of thought: materialism of Democritus and Plato's idealism. Aristotle chose the middle road. He argued that concepts come to reality only through things, and that conceptual world does not exist, as perceived by Plato.

Three most famous Greek philosophers - Democritus, Plato and Aristotle - realized that the river of human knowledge has two sources: observation and thinking. They are founders of two philosophical directions: *empiricism* and *rationalism*. *Empiricism* prefers the experience as the only source of knowledge; in *rationalism*, the source of knowledge is a mindset. Plato based his opinion on this thinking, and Democritus based his on observations and reflections. Aristotle drew his knowledge from soul mining, rather than from empiricism. Democritus's ray of creation threw lights further than Plato's and Aristotle's.

The next big thinker, who took over the ray of creation, was **Aristarchus of Samos**. What is his contribution? He used the knowledge of astronomy and geometry to calculate the size of the Sun, the Moon and the Earth, and the distance between them. On his native island of Samos he built the observatory, where he performed regular measurements and observations. In his research, he used the movement and position of the Moon in relation to the Sun and the Earth, which led him to the mere approximate but very astonishing results. His calculations indicated that the Moon is 40 diameters of the Earth away from the Earth, and 22 times smaller than Earth, while the Sun, at a distance of 770 diameter of the Earth, is even 312 times bigger than the Earth. After such conclusions he wondered: How is it possible that the Sun, which is hundred times larger than Earth, revolves around it? No! - his conclusion was the opposite compared to today's understanding – the Sun is not revolving around the Earth, but the Earth revolves around the Sun! He completely changed beliefs of that time, and established a new, heliocentric theory. He opposed Aristotle, whose writings at that time were considered the canons of thought and science. But Aristarchus of Samos remained adamant in his stands. Mankind needed two thousand years to understand his theory and the

reliability of his findings! However, his contemporaries did not realized nor accepted it.

Another thinker, **Archimedes of Syracuse**, Sicily, dared to point out the lack of Aristotle's teachings, in his treatise *The Method of Mechanical Theorems*, and independently discovered and proved the Law of the Lever. From this derived new insights: he managed to determine various geometric figures, parallelograms, triangles, trapezoids, as well as the segment of the parabola. With his Law of the Lever and Balance, Archimedes created a new science - statics - the main branch of mechanics, which is today the basis of its modern techniques. He allegedly said: *Give me the place to stand on and with a lever I will move the whole world!*

In a *Measurement of the Circle* Archimedes approximately calculated the value of number π , inscribing the polygon within and the polygon within which the circle was circumscribed, and he prorated that:

$$3,148 < \pi < 3,429$$

This is a very good estimation when it is known that $\pi = 3.1416$, a number roughly rounded to four decimal places.

In this work Archimedes concluded that the circle area equals the area of a right triangle whose one leg is radius of the circle, and the second is circumference of the circle, and for the ratio of the circle area and the square of its radius applies: $P : d^2 = 11 : 14$.

Archimedes calculated the volume of various bodies, and proved that the volume of the cone, the hemisphere and the cylinder of the same height, are in the ratio 1: 2: 3. He was proud of his geometrical proof so much that he wished to be engraved on his tombstone (thanks to that image, in 75BC Cicero managed to find the burial place of Archimedes in Syracuse). All these problems that Archimedes solved are great contribution to infinitezimal mathematic, the field established nineteen centuries later, which created a general method.

Celestial Kingdom

Greek thinkers have created great works. We will mention some of them: *Ethics* by Aristotle (including books about the universe, the origin, transience and meteorology); *Elements* by Euclid; *Almagest* by Ptolemy; *Palimpsest* by Archimedes; *Book of Optics* by Alhazen; *Elements of Astron-*

omy on the Celestial Motions by Al-Farghani; as well as a large number of medical works by Hippocrates, Galen, Rhazes ... At some moment of time, all those books were replaced by a single book: the *Holy Scriptures*, which contained revelations given by God's grace, showing the way for salvation of the soul. It was the only concern back then. The Church voluntarily took upon the duty to lead its believers to the heavenly kingdom. Whole European population was put at the service of the Church, acknowledging the *Gospel* as a supreme law of all thought and action. "Heretical" teachings of Democritus that *nothing comes from nothing*, and his theory of causality, were declared undesirable, misleading and they had to be rejected. Everything that contradicts the *Holy Scriptures* was considered wrong. That way the science, art, and knowledge were going backwards. People believed that the Earth was just a plate with Jerusalem in the center, splashed from all sides by the ocean, and the sky was in the shape of a bell. It was believed that above this bell, in one continent to the east, was the kingdom of heaven. This paradise was spread over the sky, and angels controlled the movements of celestial bodies. By the same principle, the Sun was guided by night around the base of the heavenly bell to the new sunrise. Roughly that was a picture of the world in the early Medieval Times. Complete artistic creativity - poetry, music, architecture, etc., was supporting the Church. The works of poets and painters have been crying for God's mercy.

Arabs salvaged the Medieval Times and enlightened too dark. In 622, in Arabia, **Muhammad** will become a Prophet. He flees from Mecca to Medina; his message travels and becomes conquering force. The Quran is written and Islam was born with it. In less than half a century, the religious-political and military power transforms the outdated structure, as Christianity has done previously. With arms it stopped millennial kingdoms in the name of the new form of monotheism. Shaken and awakened by Muhammad, Arabs in a short time flooded half of the world: the old Persian empire, the whole of northern Africa to the Iberian Peninsula, and disembarked on the large islands in the Mediterranean, and reached all the way to the Pyrenees. Eager for knowledge, Arabs got their hands on rewritings of ancient Greek philosophers, dusty, and long-forgotten, and they translated them into Arabic. No, Arabs did not only feed on a perpetual source of Greek wisdom, they also gave their contribution to the science of the universe and mankind.

Arabic astronomer **Al-Farghani** ordered two degree-measurements of a meridian arc length, and found that one degree has 56.66 Arabic miles

(1 Arabic mile = 1960 m). That way he surveyed the entire length of the meridians and the radius of the Earth Ball. According to his measurement, meridian scope of the globe was 39,979.29 km, which is very close to today's measurements. Also known astronomer was **Al-Battani** of Mesopotamia. Baghdad was the original research center before the Cairo took over. There lived and worked **Ibn Yunus**, the greatest Arab astronomer after Albany. His particularly famous work was *Hakemite Tablets*, which he dedicated to his ruler. Besides astronomy, Arabs have contributed in the development of other sciences. They brought the fruits of their learning close to Europe. In Cordoba, and also in many other cities of Spain, they founded a school with library containing 600,000 manuscripts. Young people from all over the Western Europe rushed to those schools, eager to gain true knowledge. Arab schools were at a way higher level than all the European schools at the time. Astronomer **Al-Zarqali** of Cordoba has made famous Toledo Tablets, with the assistance of other scientists. He also designed and constructed a new astrolabium...

At the end of the 11th century, the pious people of the West planned the liberation of Jerusalem. Vast and mighty army, led by the knights, headed East. This has led to softening of the rigid atmosphere in the West, established by the Church. A breath of fresh air was given a new lease of life to the Western world. The essence of religious power was directed to the Christian Europe.

The Birth of Modern Science

A Brief History of Time by Stephen Hawking is a popular-science book about man's understanding of the Universe, from Aristotle and Ptolemy to Copernicus and Galileo, Newton and Leibniz, Planck and Heisenberg. Stephen Hawking writes: *The old idea of essentially unchanging Universe, that could have existed forever, and continue to exist forever, was replaced by the notion of a dynamic, expanding universe, that seemed to have begun a finite time ago which might end at a finite time in the future... Einstein's **General Theory of Relativity** implies that the universe must have a beginning and, possibly, an end. Our modern ideas about the Universe originate from 1924 when American astronomer Edwin Hubble proved that our galaxy is not alone. There are, in fact, many other, and between them are vast expanses of empty space...*

However, Aristotle and Ptolemy believed that the Earth was the center of the Universe! Hawking says: *Galileo, perhaps more than any other single person, was responsible for the birth of modern science. His renowned conflict with the Catholic Church was central to his philosophy, for Galileo was one of the first to argue that man could hope to understand how the world works, and; he could do this by observing the real world... He supported Copernicus' ideas and invented the telescope to observe the universe.*

What is the meaning of the knowledge of the Universe? Maybe for the common man space-time relation has absolutely no significance. He does not understand it. This knowledge is, however, indispensable in understanding of the world and man, in understanding of human development. Curiosity, search for patterns, and models in the Universe helped the man to progress and to improve everyday life. An impact of knowledge about the universe on man's intellect, imagination, entrepreneurial energy, proved inevitable. Ideas for many inventions and practical solutions have derived from the increased knowledge of the Universe. Mathematics, economics, philosophy and many other sciences are directly influenced by the knowledge of macrocosm. It is an indication of the connection between ideas, about which we will have special consideration.

Every living being is an engine geared to the wheelwork universe. Though seemingly affected only by its immediate surrounding, the sphere of external influence extends to infinite distance. There is no constellation or nebula, no sun or planet, in all the depths of limitless space, no passing wanderer of the starry heavens, that does not exercise some control over its deserty - not in the vague and delusive sense of astrology, but in the rigid and positive meaning of physical science. (Tesla)

The systemic approach in many sciences can not avoid the reality of cosmic forces. Since the first human society, man strove to predict the eternal vicious circle of stars and harvests. Priests and prophets advocated the theory that the world can survive only if the cycle of rain and sun is continuous; a better world was possible only in a cosmic exterior, in an ideal space that is stable, cyclic; its occurrence was more dependent on the mysterious benevolence of gods than on the human efforts. When it became clear that an invention can improve material, intellectual and aesthetic life, people in Mesopotamia were determined to design and implement a progress in their earthly life. This course of action will lead to a scientific revolution in the

15th century, as a result of thinking and creating philosophers, artists, legislators, scientists, economists, and sociologists.

The question about the Universe had a specific impact on the clash of ideas and their diversity which has led, in the specified periods, to a radical change of opinion, or to the shift in the world paradigm. We know that many great works in literature and art were created in those paradigmatic influences, in reviews and searches for phenomena, bodies and movements in the Universe. Here it was *Ray of the Microcosm*, in England *Paradise Lost*, In Italy *The Divine Comedy*... In questions about the Universe, Njegos referred to Pythagoras and Epicurus, as well as on *evil tyrants with immortal souls*. They and their followers, according to poetry of Njegos, have *degraded the human name and vocation before God, equalizing it with mindless*.

The development of the art and science, that contributed to the rise of the mankind, did not stifle the idea of God. Indeed, most people on this planet have believed and still believe, despite all the scientific findings, that God created the world and man, and that he was their master in the after-life. At the same time, during the most intensive period of scientific discoveries in human history, in the computerized era, starts an eruptive development of Islam. Billions of people, even prudent individuals, believe in Muhammad, and that belief continues...

Let us remember the ancient Greek thought that nothing comes from nothing. All ideas have their own causes and reasons for their occurrence. For example: Why the idea of Nazism did not arise in the United States of America, but in Germany? The United States have managed to overcome the Great Depression in 1929, to balance the odds and to amortize destructive forces. Germany has failed: Social inequality, fueled by massive crisis, spawned destructive forces in German society. Where there is no creation begins destruction! The Western world has had a significant advantage – providing functional market forces and the market as a mechanism in the economy (creatin banking sector, financial institutions, legal infrastructure). That was not the case in Europe, where colonialism did not allow the development of market forces, nor competition. The monopolies and colonies were nurtured and defended with the most powerful armies. In conditions of high inequality, poverty, lack of freedom and democracy, Nazism and socialism were born. However, neither the idea of Nazism, nor the idea of socialism, were able to redirect a unique long-term course of history. As the **Jacques Attali** points out: *From century to century, mankind places indi-*

vidual freedom above all other values. This was particularly enabled by technological progress, that has imposed reduction of efforts, and the release of morals, political systems, art, and ideology. In my opinion, the creation of man has paved the path for his affirmation as a full entity authorized to think and control his own life. Therefore, this book affirms the path of creation, especially in the last three thousand years, so today or tomorrow, the individual would chose creation as his affirmation.

Which idea still dominates the global scene? I would point out the globalization of markets. The market will be more and more global, while democracy exists and will exist locally. Those who aspire to diminish the power of the state, and to take power for themselves are gaining strength. In particular, this means that the capital, direction and strategy of the enterprise, will be increasingly detached from the national database; their headquarters and delocalisation will be bound to the places where the laws are the least restrictive and where taxes are the lowest. Their managers and researchers will live in areas where competition is constant; mobility of labor and capital will enable employers to avoid all the rules; to choose the country and the place where they want to pay taxes; technological evolutions will accelerate migrations and nomadic way of life, real or virtual... No national government **will not be able to prevent the constant disloyalty of capital and managers. We will see a reduction of fiscal resources and weakening power of the state.**

The world will not be like at the end of the 20th century - one economic union with subordinated markets in mutual integration - but one independent, market economy, almost pure and perfect, without states. It will be similar to the one described by classical economists: Walras, Friedman, Parrett, Arrow Debreu and others. They have modeled a market economy without a state, and concluded that such an economy is not in equilibrium. Such mondialization of the market, without the globalization of the state, can only lead to insufficient demand, unemployment, and favored industrial monopolies. But this is just a brief entry into the history of future. Let us return to the man's creations, to material goods and market forces, which are taking over the planet since the 17th century. The last expression of the triumph of individualism, the triumphal march of money, slightly slowed down by the financial crisis in 2007, explains the most basic twists of history and the role in creating it. Two inventions of capitalism on which the aforementioned triumphal march is based, certainly revolutionary, are the idea of a market and the idea of a democracy.

5. THE CREATION OF MATERIAL GOODS AND ITS IMPACT ON THE MINDSET

System that controls our lives exists only in our imagination. Although it exists only in our minds, it can be interwoven into material reality that surrounds us. Each of us believes in something, each of us has a shiny ray of light that gives value and meaning to our lives. This ray is actually a ray of creation that always shines in our imagination.

Imagination brings changes that are taking place through the dynamics of conceptual and material world. We can not ignore the relation of these two worlds. They form a duality. Namely: The state of the material, the created world is a reflection of mind. About this relation Veselin Vukotic says: *There can be no scarcity of material without scarcity of thought or material wealth without the wealth of thought! Respectively, poverty (the visible one) is a state of mind (the invisible one)!* Indeed, when we think about economics, as a way of creating material goods, we must assume that it changes in the ideological sphere – by altering ideas, cultural values, and beliefs. That is, by changing the collective memory, which determines the mindset of people and their mentality. The tree of creation has two deep roots, spiritual and material. And how deep those roots go? In fact, we must go back into the past to find out when was a turning point in the development of the human race, and agricultural revolution, which later enabled all other social upheavals. Declarations of independence, the storming of the Bastille, the Battle of Wagram, man on the Moon, access to the structure of atoms... hardly would have happened if ten thousand years earlier the most crucial revolution of all did not happen - the so-called agricultural or neolithic revolution. What had been changed so radically? Organizing life in the villages that were producing food has changed the life of a man completely. There were conditions for the emergence of countless occupations, many of which still exist. The social distinction between family and individual was possible. However, even this phenomenon should not be

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regarded solely in the negative light, because the occurrence of these differences has allowed further strengthening of civilization, making life safer and more comfortable. The fact that people were living in one place allowed them to have possessions that nomads were not able to afford. With the beginnings of architecture came the desire for interior decoration and furnishing of premises. The produced food needed proper storage, and over time the surplusage was being exchanged – those were beginnings of a future trade, and with that the beginnings of economic activities.

Human needs were growing. Apart from meeting their basic needs – providing food, housing, water, clothing, etc. – people began to want a lot of things and to strive toward them. However, *fiasco* of Garden of Eden, ruthless nature, mass of people around us, and many other factors, indicate a gap between what we want and what is available to us. Accordingly, what we want exceeds what is available to us, which means that we strive for more resources. In between these desires and actions, there is an economic life, and we are guided by *self-interest*, which implies a choice between two or more items that will deliver us the required satisfaction. In doing so, we will always choose what we expect to provide us more benefits and less expenses. Those who prefer beer, do not buy a Coke; those who prefer Mercedes, do not buy Fiat, etc.. It is not crucial whether what we want is of material nature or not. We may want concrete, physical things (e.g., computer, car, house...), but we may also want intangible things, like friendship, visiting museum, exhibition, and so on. Everything that provides pleasure is good. People satisfy their needs by acquiring or consuming goods, but to do that, the goods must be produced. The fact that what we want exceeds what is available to us, has led to the creation of the two most important economic concepts: *shortage of goods* and *expenses*, related to the potential opportunities. When we buy one thing we give up on something else, which could also provide us a pleasure, and can be obtained for the same amount of money.

The behavior of people during several thousand years, indicates that human desires are limitless. It is because desires arise to the same extent or even more than meeting the current desires. Thus, two fundamental questions of survival, that all societies faced since the beginning of history, are: *Who gets what?*, and *Who does what?* Historically speaking, it was dealt with in different manners. The most commonly used methods to solve these issues are: competitive prices, violence and bribery, time priorities (creation

of rows) and personal connections, and then the physical appearance (such as female beauty) and, finally, planning at the state level. All these methods mean giving priority to one and submission of others. Historically, the best method of solving these two issues are: competitive prices through the free exchange or trading.

For thousands of years, people have created (produced) and traded goods. Given our desire for greater pleasure, the exchange is the most important method for improving our well-being. The choice we willingly make, in our own interest, has resulted in the movement of goods from its holders, who value it less, to those who value it more. In making that choice we perceive and assess opportunities in subjective way.

The exchange takes place by means of money or other goods. People become involved in the exchange because they expect that the benefit from the acquisition of a given good will be higher than the costs. In the world full of uncertainty and lack of information (rational limitations), individuals differently perceive package of available options for exchanging. Namely, each individual has his own criteria when it comes to the things he loves. There are no two similar individuals in talent, personal characteristics, the world view, aspirations and tastes. Economists want to know why and how these tendencies are manifested as something that can be observed. Basically, there are two types of observations. First, the manifestation of our tendencies are narrowing under the influence of relative usefulness. The amount of beer, per unit of time that a person drinks (e.g. for one evening), depends on the relation between pleasure in drinking beer and pleasure that provide other goods that are being sacrificed for the sake of drinking beer. Thus, a person who drinks a glass of wine every day at dinner, will see that this increase the price of wine, means that the waive of the pleasure would give him a greater amount of some other goods. In that case, this person will be encouraged to reduce the consumption of wine. Secondly, there are alternatives that individual investigates alone, so that individuals receive, through these alternatives, the new information about the pleasures arise from various assets and, at the same time, create new demands.

In selecting the alternatives, personal income is certainly a limiting or determining factor in defining that process. In a market economy, the amount of our revenues depends on the value that our services have for others. Depending on our personal budget, our choice of goods is in line with our priorities. However, even then, there are different behaviors. Even with

high budget (say 100 euros) for daily costs, some may decide not to order another beer, if the price of the beer has increased from 1 to 2 euros. The pleasure from buying other goods (ice cream, for example), which can cost 2 euros, usually is the main factor for making this choice. On the other hand, one who is able to spend 50 euros, being a big fan of beer, will perhaps continue to buy it even for a higher price.

We were talking about free choice where individual makes decisions based on subjective attitude. Forced choice or effort of some people to, allegedly, protect others from *bad choices*, subtracts the natural right of individual. Such an approach does not give good economic results due to apparent discrepancies in understanding of those who make decisions (even if they are better informed), from understanding those who make decisions. We know that this is often the case, and always in the name of "equitable common good" or "public interest". Certainly, there is a constant dynamics of human desires, preferences are changing every day: What yesterday was need, today is replaced by new desires.

Creation of goods is associated with the material, visible world. However, we can not turn off the spiritual (invisible) part of economy. In order to answer the man's quest for more pleasures, entrepreneurs continually create new ideas, new technologies, new processes and new products. That constant interaction takes place between spiritual sphere and material manifestation. Thus, there is visible and invisible in the economy. The invisible can not be reduced only to the economic ideas, because it is linked to many other spheres of human life: literature, art, music, etc.. It is our microcosm, which is preliminary, heavenly, invisible to the eye, conceivable only by intellect. It is a source of energy creation.

Economic (creative) themes are present in many works of artists, poets, writers, painters... The basic theme of Shakespeare's *The Merchant of Venice* is purely economic. **Karl Marx** said that he learned more about economics from **Balzac** than from economists. An interesting example that illustrates the intertwining of conceptual and material in the life of greatest minds, is *Testament* of Njegos. The first part of his *Testament* is poetry, and then, in the second part, poetry is replaced by prose. It springs of emotions of the spirit, which is deeply burdened by economic concerns. The style of the poet and his expression simply adapt to economic thought and reality. **Isidora Sekulic** notes that Njegos' expression and language are "flat" in the second part of Testament. Njegos worries about the money, which is in the

banks. He is leaving it to Montenegrin people, *and profit from them goes to Bishop, who will succede him, so he could buy gun-powder to defend freedom, and in years of famine to buy grain and to distribute to the poor people Montenegrin and hilly, so that the said money can not be taken from the bank, but to eternally remain there, only to be used.* The greatest part he leaves to his people, but also to the family, brother and sister...

Obviously in the material shackles, Njegos has created a spiritual product of the finest quality. He wrote an ode to *Montenegrin wreaths*, which are pearls of beauty, light and darkness, life and death, love and hate, past and present... The souls of all Montenegrins have spoken in **Mountain Wreath**; they have spoken of their suffering, their achievements, their beauty, their time, their creating and not creating, and finally – of the Montenegrin society. The spirit of Njegos has emerged and grew in gray stones, where the Montenegrins were cornered by those who were stealing the most fertile plains, rivers and coasts, the richest resources. His creative spirit was melting in divine joy, admiration and beauty of creation; on the other hand, it was pinched by the fate of scarcity, both in resources and communication. In addition, it was limited by imprisonment of birth and death. In the works of Njegos, including *Testament*, an idea was abducted of matter, through a poetic vision of creating the world.

His *Testament* ends with a reference to the institutions, which are important for the functioning of the economy. Soon ended his life, but *Testament* remained, showing some situations and relationships, which were essentially creative. *Testament* has spiritual and material content, exactly the same as human existence! A poet on the wings of spirit, *mind-wings*, as Bishop would have said, was rising, rising, but his achievements have been expressed in the field of material world. The fact is that it was not neither silver nor gold, nor houses nor vineyards, but money. The story of creating goods is also a story of money. It is also the story of exchange and growth. Engine of growth are mental powers or the entrepreneurial force! New ideas that create new products and new processes.

In Montenegro, during Njegos' reign, there were no growth in the economy. However, low economic growth was also recorded in Europe. Historically, the growth was insignificant until 1550. From 1550 to 1820, the growth rate stood at 0.01 percent. Individual income during the lifetime (which then lasted for about 40 years) increased only 3 - 4%. The problem of growth was actualized recently. Economic growth has been recorded

since the 18th century, especially after the Napoleonic wars. Before that, for ordinary people, but also for philosophers and scientists, the economy was somewhat static. There was no economic development, and most economists have dealt with distribution and redistribution of income. For them, therefore, the problem was: How to divide the *cake* with largely determined and well-known size?

Even today, there is a classic view of the revenue, and we often hear opinions about insufficient demand. The vision of the past was this: the cake is always the way it is (defined), and economists try to divide it in the best possible way. And today is often thought of in that way.

Growth, Economic Vision, and Smell of Money

Adam Smith, considered the father of economics, did not consider a theory of growth. **Ricardo's** and **Marx's** vision of growth is linked to the accumulation of capital, at where return on capital decreases, and that in turn stops the growth. All this shows that the mental forces are used sparingly, because growth has not existed as a topic for consideration. Sporadic is also talk about entrepreneurship at the University of Spain in the 15th century, then in France, late 17th century (**Jan Baptiste Say**), late 18th century **Karl Menger**, so the entrepreneurship would revive in the works of **Mises** and **Hayek**, at the beginning of 20th century.

This economic vision remains dominant, even today. The most representative author within this vision is **Lord Robbins**, who in 1933 defined the purpose of the economy - that is a definition that prevails today, although it is wrong, nevertheless. According to this definition, *economy is activity in which the actor is looking for ways to maximize the objectives*. The objectives may be maximization of production or maximization of social welfare, but also some others. The maximization is limited by available resources.

Why is this relevant? Because of the fact that this understanding of economy is just following a completely static economy, or economic thought. But, what kind of vision, if it apriori implies more restrictions, and no solutions? For instance, this vision represents the productive resources (such as: oil, labor and capital), and we must look for ways to use them better, and to achieve the set political goals. Thus, an economist is a technocrat! He simply needs to find a system of combination of production factors to maximize objectives and minimize costs in the most effective

way, according to the needs and ideas of politicians. Respectively: resources and technology are given so that, essentially, there is no technological progress, and production factors are unchangeable. This is quite a static vision of the economy and life.

However, a static vision has evolved into a neoclassical, since the actual economic life proceeded with a certain dynamism, and the neoclassical approach had to present the dynamics in the classical vision (i.e. to admit that technology is not static and that technological progress exists). However, the neoclassics did not have a consistent vision of technological progress, and that became very obvious. According to one interpretation, technological progress is given, an external factor. According to other, technological progress is a factor of production, as everything else, and investing in technology produces technological progress (not immediately, but in a year or more). The factors of production are: land, capital, labor, and technological progress; it can be acquired by investing in research and development, or by investing in machinery. Neoclassics have simply ignored the truth that the combination of these factors are being changed, as well as the availability of the above factors. For instance, it may happen that the factors of production do not exist, or are very rare and insufficient, and soon after they happen to be sufficient and abundant. The factors of production, which are in one moment weak, next moment they are not (e.g. oil or coal). In the 18th century, coal was the main source of energy and the world feared that it would deplete. However, new sources of energy have been discovered: oil, solar energy, nuclear energy, etc. The attitude towards coal has changed and it was no longer a rarity, and therefore, it has lost its value, and its necessity.

In contrast to this approach, the Austrian School has developed a theory of technological progress, based on the figures of an entrepreneur. In classical and neoclassical interpretation of economic growth, there are no new discoveries, because there is nothing new to be discovered (lack of dynamic vision). In this restrictive vision, where there is no uncertainty, everything is familiar and known. Everything can be learned, the only question is how much the information will cost. If something is ignored, it is a conscious decision, since the price for information is not going to be paid. Although all information can be obtained and on therefore the costs and benefits can be analyzed.

The creation of material goods and its impact on the mindset

At the end of the 19th century entered the Austrian school of economics. The vision of the Austrian school differs from the classical, because it assumes that the information is imperfect and it can not show everything.

In this vision, the entrepreneur is the one who has imagination, who sees further, who reveals and tries to find possible ways to earn money or the ability to reduce losses; he risks with the aim to create new ways of producing existing goods or new ways to satisfy the needs for new products.

Earlier we emphasized the role and importance of ideas in the human existence and achievement, hence, it relates to the economy. Ideas initiate the economy, technological progress and development. *Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist*, wrote **Keynes**. *Too much attention is paid to political and economical interests*, he continues in his most famous book from 1936. *Ideas, not vested interests, which are dangerous for good and evil*. That Keynes was right indicated his work, therefore the Keynesian idea lives even today. In the economy was adopted a greater role of the state, and when Keynes was gone, Keynesian economics was at its peak. It was accepted that the state had a greater role in the economy and special attention was paid to fiscal policy. It was thought that the state could stimulate economic growth through budget deficits, and to calm the overheated economy through saving. It lasted ten years after Keynes's death. In the seventies of the 20th century, Keynes's ideas began to fade. They were surpassed by the idea claiming that *a rival is the market economy*, developed by Hayek, whose contribution to an idea of the market was fundamental, but more focused on political economy and macroeconomic understanding of the free market benefits. However, the Keynes's idea was most obliterated by Milton Friedman, an economist from Chicago. When it comes to macroeconomics, Keynes and Friedman are considered the most influential thinkers of the 20th century. The opposite of their economic visions is differentiated by diverse views on the causes of the American Great Depression in 30s of the 20th century. Questions of causes and solutions to the crisis have transformed over time into more general, theoretical questions about the effects of fiscal and monetary policy. When in 2008 the world was hit by the biggest economic crisis after the aforementioned depression, diagnosis of this crisis, and its solution, have been based precisely on those two ideas.

Keynesianism generally recommend the greater government role in the market economy. This role is primarily focused on stimulating the demand. According to Keynesian economic point of view, the main drivers of economy are the customers. During economic crisis and weak economy, demand dries up since the buyers get scared, and businessmen lose optimism. Demand decrease and abstention from buying reduce investment. Consequently, the economy is destimulated, decreased consumer demand discourages companies that suffer due to reduced sales, and therefore, they reduce business activities and lay off workers. Companies and consumers spend less, so the role of the state is to initiate demand. With increased budget deficit and spending of any kind, the state can create demand, which will then stimulate the economy. Stimulated economy will in turn create new investment and consumer demand. The vicious circle of austerity and recession will turn into a positive spiral of consumption and economic growth.

Milton Friedman has uncompromisingly advocated a free market, doubting the Keynesian theory. His survey of the economic history of the United States has given the following result: the most important cause of all economic trends are money movements. Great Depression and its incompetence was created by FED (US Central Bank), since it has allowed the drop of money for one third at the beginning of the 20th century. The economy, therefore, is not stopped due to irrational reduction of consumption but because of artificially induced insolvency. Great Depression did not end due to more spending, especially not due to devastating Roosevelt policy of control and nationalization. It ended due to FED, again, when it finally got in the way of decline in money supply and allowed its recover.

Maximum simplified views of opposing ideas can be summarized as follows: Keynes has determined a possible irrationality of the market as the cause of the crisis, and the way out of it was fiscal policy in the form of deficit spending; Fridman (and monetarists) has indicated the monetary policy as the cause of the crisis, but recognized it also as a way out of it. (Crises arise when the central bank makes a mistake by exaggerated restriction, and the way out of it is to prevent deflation and return to a neutral, not an inflationary monetary policy.)

When in 2007 erupted financial and then the world economic crisis, the old lines of division have been revived. In search for solutions first was

approved Keynesianism. American, European, Chinese and other worldly Keynesians have had the opportunity to test their theory in 2009. Same year, the Obama administration and Congress have adopted a package of \$787 billion fiscal stimulus. China has done the same, with relatively similar scope, as well as European countries in somewhat modest extent. Budget deficits were reaching up to 10% of GDP, the money was being spent on everything, from infrastructure to social benefits. All this shows that policies of fiscal incentive have not yielded the expected results. The fact is that the fiscal stimulus have been overcome. Keynes's ideas was revived in full measure, but it lasted short and without effect.

The monetarism got the chance, in one of its forms. FED, and then the central banks of England, Japan and other countries, have implemented a policy of quantitative easing, which means that the central bank printed a lot of fresh money. In the background of this idea is the theory that the general recession was caused and prolonged by restrictive monetary policy, similar as FED's negligence caused the Great Depression. The role of monetary expansion was to fix things.

Ideas of money, Exchange, and Banking

The vision of monetarism is based on the importance of money. Money is at the beginning and at the end of each economic activity. A company can not be established without initial money, production factor can not be bought without money, therefore, there would be no production. After all, without money can not be the reproduction and development of the company. Generally speaking, without money there is no creation! Due to its importance, understanding the philosophy of money has guided me to mention some basics that will help deeper and more comprehensive thinking about the secrets and the essence of our creativity (not just economic). Hundred years ago, **Georg Simmel**, German philosopher and sociologist, has criticized the economization of money, which has become a central symbol of human society. In his *Philosophy of money* Simmel explained how the money initially was a mean to achieve a goal, and later became a goal in itself. Calculation has become the main purpose of human existence and the only view of the world. According to the latest estimates, 97% of the total amount of dollars in the world is virtual (i.e. it exist only as numerical information), while about 3% of dollars in the world are paper money, cash. Today, money has almost become an abstract category, getting closer to

heavenly values more than ever. It comes at the bank accounts and goes for about the same speed, and who has it in his wallet acquires power similar to shaman in the tribe. How to understand this phenomenon? A sure way to understand this is to understand why the money has emerged.

The story about money is related to the exchange of goods and services. The emergence of money is associated with the need for exchange of products. The economy is a system of exchange, and it is based on an exchange, rather than on production. More broadly, society relies on the exchange, therefore, for **Simmel** *every interaction (a performance, a conversation, or even a romantic affair) could be understood as a form of exchange in which each participant gives the other more than he had himself possessed* (Ibid.44). Long time ago, at the low level of economic development, exchange had happened by accident. It took place in some form of barter - exchanging goods for goods. The man did not have to, nor could to produce everything he needed. Therefore, he specialized in the production of one type or group of products. Everything that he did not produce by himself, he procured through the exchange with other people. Bartering is a "coincidence" of desires. For example, when person X, who sells goods to person A, needs goods from person B, which is sold by person Y, and at the same time person Y needs goods from person A. If this coincidence is missing, then the exchange can not be achieved. Over time, from the total range of the goods begun to allocate certain goods that served as a general equivalent, or for which could be gotten any other goods during the exchange.

Hunters-gatherers did not have the money. Each group was hunting, collecting and hand making almost everything that was necessary, from medicines to clothes, footwear and weapons. The group was almost economically independent; just a few little things that could not be found in the vicinity (shells, paints, etc.), had to be supplied from strangers. Obviously, that could have been done through barter: "Give us a good flint, and we will give you this beautiful piece of meat".

Specialization in the production of certain goods came with the development of towns (and kingdoms), and with improved transport and infrastructure. Densely populated cities needed large amounts of wine, ceramics, oil, furniture and other. Villages, which acquired a reputation by producing such goods, realized that it was better to specialize in manufacturing certain products, offering them in towns and other populated

areas, in exchange for other goods which they needed. That improvement of skills and production made sense, having benefits to all. However, specialization has created another problem: How to establish the exchange of goods between specialized groups? Barter can not provide the basis for a complex economy. Limitations of barter are in the number of exchanged products. If hundreds of different products are traded in the market, then the buyers and sellers must have 4,950 different measurement rates. And if 1,000 products are traded, buyers and sellers must count on 499.500 different measurement rates. In that case, barter is not a solution. Another limitation is that each side wants what the other has to offer. What to do, for instance, if shoemaker does not like apples that fruit grower offered for his shoes, but he wants language lessons? True, the fruit grower may find a teacher who needs apples and arrange triple exchange. Clearly, that is difficult to achieve and requires additional time.

An instrument that solves this problem is money. It is not just coins and banknotes. Money is everything what people are willing to use that systematically represents the value of other things in exchanging goods and services. Money allows people to quickly and easily compare the value of different products, to easily exchange one thing for another, and to preserve wealth in an appropriate manner.

In very ancient times, due to a need for exchanging goods, money has grown, although uncontrolled, in various nations. It has been developing for long time, again uncontrolled, and later it was under the influence of conscious social will. The role of money have long acted various products, according to the natural and economic conditions of individual peoples.

Over time, all nations started using various, valuable metals (iron, copper, nickel, silver, and gold) as means of exchange. Due to its features, the precious metals were extracted: gold and silver, remaining long time in use as a parallel medium of exchange and payment in determined constant mutual exchange rate (usually 1:10 and 1:16.5 in favor of gold). This so-called bimetallism lasted until, largely due to its increased production in the second half of the 19th century, the silver started to lose value and thus disrupted its ratio towards gold. Then, countries introduced a unique, mainly golden coins (i.e. metallism).

The use of coins goes back into the past (appeared about 5 000 BC). The original coins had long been used in a primitive form – uneven pieces of different shapes and weight. Therefore, measurement preceded any payment,

hence the name pensatoric payment (pensare – to think, to measure). Later, the pieces of metal started receiving mint marks, containing information on weight and strength. Unfortunately, that was soon abused. Only later, the state takes over stamping the coins, due to greater confidence and authority. The form of coins is being unified - metal plates, as the most suitable, with appearance of terms (words) *currency* and *monetary*. Instead of pensatoric, the payment is done numerically (i.e. a simple counting of equal pieces). A great revolution takes place in the further development of money, when the state begins smithing and smelting coins. Hence it gets significant and real incomes. The first coins, according to historical findings, were made around 640 BC by the king of Lydia in western Anatolia. These coins had standardized weight of gold and silver, and stamped trademark, revealing two things: 1) how much of the precious metal was contained in the coin, and 2) the authority of the one who has issued a coin and who guarantees its value. Almost all of today's coins originate from these Lydian.

Money of the Roman Empire was called *denar*, and Roman Emperor guaranteed the integrity of the coins, on which were his name and portrait. The power of the emperor was based on denar. Just imagine how difficult it would be to govern such an empire, if the ruler had to collect the tax and pay wages in barley or wheat? It would be impossible to collect taxes in barley from Syria, to transport it all the way to the central treasury in Rome, and then again to Britain, to pay off the legions.

From the fact that money circulation includes also the payments whose real value is not equal to the nominal, later were developed the first banknotes, and then the real paper money. Banknotes have almost no intrinsic value, since the value of the paper, paint and labor expended to produce it is negligible. But banknotes can be exchanged for gold coin corresponding values at, any time. This characteristic is called convertibility. Respectively, banknotes are not real money, but replacement for money. Due to the uncertainty of traffic, it was dangerous (and impractical) to transport larger amounts of gold from one place to another. Therefore, the traders entrusted coins to banks, and banks issued them certificates, initially on behalf of those who issued them. By their "rewriting" to the bringer, designed in the appropriate form and pledged to the bank to be exchanged for cash at any time, they begun to fully and very effectively perform the role of money. During the development, the state recognized an edition of banknotes only in favor the issuing bank. Thus, the initial voluntary consent to receive

banknotes instead of coins was replaced by so-called compulsory course, and the state imposed the obligation for all citizens to receive them for regulation of all financial transactions. However, at compulsory course, the banknotes initially had a completely gold coverage and always could be exchanged for gold. Later in this respect appeared different constraints. Coverage was no longer complete but partial, whether in a certain percentage or in other ways, and it has developed various so-called systems of coverage worldwide.

When the interchangeability of money in gold was abolished (i.e. when its holder lost the right to obtain coins for them), the coins have lost their former character of surrogate money and have become real money, becoming legal and definitive means of payment, and as exists and is able to receive unlimited amounts.

Money is universal mean of replacement that allows people to convert almost everything into almost everything else. Muscles are converted into brain when a laborer pays his tuition fees from his savings. The estate is converted into nobility when baron sells it to support his servants. Health is converted into education when the doctor uses his salary to pay for his daughter's studies in a prestigious private college.

Ideal types of money allow people not only to transform one thing into another, but also to preserve wealth. Many valuables can not be preserved - such as time or beauty. Some things can be preserved for only short periods, like strawberries. Some other thing is more durable, but takes up a lot of space or requires expensive maintenance or attention. Wheat, for example, can be stored for years, but it is necessary to build huge silos and provide protection against moisture, fire and the like. The money, whether in paper or in computer's memory, solves all problems. Money solves even the problems of assets transportation.

With money, assets can be easily and cheaply converted, stored and transported. Therefore, money has given a measurable contribution in the complex commercial networks and dynamic markets. Without money, commercial networks and markets would be condemned to a very limited extent, level and dynamics. Simply, money is positioned as a life force of creation. Money can buy everything, money is a connection between all things and the whole world is in a continuous motion because of the money.

More important is the role of money in developing an individual freedom. Money makes connections among people and encourages creativity.

Finally, understanding the origin, role and social power of money actually plays an important role in understanding the structure of modern society.

Wealth and Influence

As a dominant personification of correlation between money, material, and spiritual creation, the best example is **Cosimo de' Medici**, a great banker of Medici family, from Italy. Medici were the most important Florentine family, whose rise began in the 13th century through commerce and banking. Later they became the bearers of the highest social functions in Florence, Tuscany and Italy. They built their wealth and influence through textile trade guided by the guild of the *Arte della Lana*, and wool trade especially with France and Spain. After that, like other aristocratic family (signori), Medici dominated the **Florentine Signoria** (government). Using their wealth and influence they made Florence an environment in which art flourished and gave birth to the Renaissance.

Cosimo de' Medici was the most successful financier in the Medici family. Today, he is not remembered for his wealth, but as one of the greatest figures in the history of art - as Renaissance sponsors. He spared no money to beautify Florence, the greatest Renaissance artists of the time worked for him. Cosimo de' Medici hired the young **Michelozzo** to design a palace - Palazzo Medici - and thus created a prototype of the Florentine palace, which was later imitated by many. He was also the patron of philosophers - particularly influenced by Greek refugee **George Gemistos Plethon** - who founded the Platonic Academy of Florence.

Nearly half of the 15th century, he ruled Florence, although he did not have official titles. The story of Cosimo de' Medici was actually a story of money and conscience. A larger part of the family fortune Cosimo intended to creating the new Florence. He built palaces and churches, formed one of the largest libraries in Europe, and commissioned a translation of all Plato's works into Latin. He helped many artists, from Donatello to Fra Angelico. He was one of the founders of the humanistic movement which became the foundation of Italian life. On his deathbed, he

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was given the title *pater patriae* - father of the fatherland. He became a form of readiness to use money for real, general purposes.

Cosimo di Giovanni de' Medici was born on September 27th, 1389. He and his younger brother Lorenzo had their first education in the monastery of Santa Maria Angels. Monastic school differed from the others; the most attention has been paid to the study of re-discovered texts from the classical world. Cosimo also learned German, French and Arabic. In that school, he developed a passion for pre-Christian classical world, the language revival, learning and the art of the ancient Greeks and Romans. After gaining the broad education, Cosimo was sent to apprentice in the family business, where he showed an instinctive talent for the job. He had broad education and practical knowledge, thereby he fascinated his contemporaries. About him Machiavelli wrote the following: *Cosimo di Giovanni de' Medici was about medium height, had olive-colored complexion and views worthy of respect; ... he was very eloquent, gifted with great natural capacity, generous to friends, kind to the poor, extensive in conversation, cautious in advising, as well in speeches and replies, serious and witty.*

Cosimo was eight years old when Medici Bank was founded. Since he was the eldest son, his father Giovanni prepared him from early childhood for the job. His father had laid the foundation of their Bank, but Cosimo was the one who established the blinding power and legacy of the Medici family. He took over the management of the bank when he was forty years old. Machiavelli immortalized that in his records: *After Giovanni's death, Cosimo de' Medici seriously accepted public affairs, he was friendlier and more reasonable in dealing with friends than his father, so those who looked forward to Giovanni's death, when they saw how capable was his son, realized that there were no reason to gloat. Cosimo was one of the most assertive: a man of serious and respectful posture, extremely liberal and humane... he became a protector of citizens of all vocations.*

Basic characteristics of his personality, and even success are: permanent initiative, entrepreneurial spirit and modesty. His contemporary Vespasiano remarked: *Whenever he wanted to achieve something, he made sure that the initiative come from others, not from him, in order to avoid possible envy.* Machiavelli confirms this assessment: *Although his residence, like his deeds and actions, was quite royal in character, and he himself like a prince of Florence, everything has been in that measure conformed with his thoughtfulness that never exceeded the proper moderation of civic life; in conversation, when the servants*

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were concerned, in travels, lifestyle and relationships, he always had modesty of the citizen; he was aware that constant pomposity causes more envy than earthly life without ostentation. However, the secret of his success is in the bank's business model. His business model was slightly different than today's models. Indeed, Cosimo is the forerunner of modern banking! Bankers took up position on the currencies; they risked on the long run, limiting them with stable transactions. They used loans, bills of exchange and speculation with the course.

6. INNOVATION - THE SECRET OF SUCCESS

Man is the only living creature that has mind, imagination, and the ability to create. He has the special ability to change the environment, adjusting it to himself in the innovative process of creating! He changes not only the environment but also himself: he climbs ladders of ascent - through evolution and in society! The environment changes, and the man, too. By innovation, step by step, life is improving. Inventions are sequencing: stone tools, fire, clothing, footwear ... New discoveries have changed the behavior of individuals and society. Changes in equipment are also revealing changes in behavior and action.

In the ocean of life, man fights through creation. Thinking drives human creation, first empirically, and later abstractly, through generalization of things, emphasizing logical regularities in phenomena and processes. Millions of thoughtful and experienced attempts can create even a slight innovation. In the spontaneous circumstances of everyday life, something new is being born. The form of the research is as important today as ever. It should be understood that innovation is not only a great breakthrough, but a collection of small, often invisible improvements. It stimulates us to believe that everything we do can be better: the way we work, write, think, communicate... the way we dance, run, or organize our time.

This is the core of the entrepreneurial philosophy that I want to encourage and help you to develop by reading this book. Because, I believe that this philosophy can help you to discover your creative power. This philosophy teaches you to always win and to beat the fear of challenges in life. It is necessary to differentiate yourself from your usual thinking, from a *philosophy of shallow-mindedness*. Only then you will take the path of creation and innovation. Look around you: How many young people are living without challenges, turned to leisure, superficiality and trivial matters, away from literature, painting, music ... away from life?! That is a futile

time, a giant hole in their lives; that is time out, which ravages their hearts and souls - a uniformity that can not generate positive thoughts, nor diversities, nor joys of life. How many people are spiritually old, although physically young?

How to change the way of thinking? How to innovate your life? How to take your life into your hands? How to find the talents that evolution (biological and cultural) installed in you? Again, the creation is in the nature of every man. Therefore, the transformation from a passive to an active attitude towards life is linked to the understanding of these natural facts, to that foundation of existence. Brilliant people have confirmed it, encouraging and creating brilliant ideas. They have carried a entrepreneurial philosophy of creation. Some of them are: Aristotle, Archimedes, Euclid, Copernicus, Galileo, Newton, Einstein, Tesla... Just mentioning their names arouse admiration! They are our spiritual role models! These pioneers of history still inspire generations, carrying them on their intellectual wings. With this book, I want to inject you an energy of achievements, which we all need!

Like them, we all have the imagination, an ability to imagine the future. Try to imagine yourself in twenty years, if you have not already done so far. What will you need to achieve in the next 20 years which will make your life fulfilled? And every day until then to be fulfilled? Every day to be your holiday? I'm not exaggerating: I'm talking of doing in life what you love. For **Ivo Andric** that was writing, for **Dado Djuric** that was painting, for Nikola Tesla that was working in the laboratory, on his genius patterns and problem solving. How fulfilled is the life of a programmer or web designer? Same as in the previous examples: creating programs in order to make a quality product that generates income! That is also important in business: to fight for an idea, for its materialization - a product that has a use value. What has inspired **Tolstoy** to edit *War and Peace* seventeen times? The power of creation! It is wrong to think that happiness is found in the creation of material wealth. Rather, it is in the creation of spiritual wealth. However, you need to understand what is spiritual wealth. Do not get fooled by the orchestration of large salaries and benefits of material wealth, because, very few people are materially rich and happy at the same time. The story of such wealth is a delusion, more than actual and real possibility. The truth is the opposite: there is an illusion of democracy and the market, created by capitalism. It is also a misconception that most wealthy people had been led by large profits. On the contrary! Suppose that Bill Gates, the

richest man in the world, has never thought about profit: his guiding star is to contribute to humanity by creating a revolution in the ways of administrative work, in production, in life in general. Because Bill Gates has dreamed of how to connect people and businesses to work more quickly, through synergy of networks and teamwork.

For the transformation is the most important to rouse *frenzy for knowledge*, which is in all of us.

It begins with visualization of the new goal, thoughts and ideas are triggered, connecting the vision that you see through your telescope of the future, with an ability of the embodiment. It all starts with the picture of our vision, which is to be ultimately formed. This is a process, not a quick solution. There are no instant results. Therefore, very important is to have a glimpse into the future through the telescope of the future. Our creativity is awakened and developed by the future, not by the past. If we want to achieve something, to create an image of an object, an image of the future, we have to work on the transformation of thought-image into phenomenal – a subject or another creation.

A passive attitude toward the future suppresses our thought, and we lose ideas in the arena of life. However, we are thrown into the ocean of competition. Dialectical thought is not enough. Everything must be run into reality and used. The knowledge which is static, bookish, without specific use, remains only our knowledge and becomes worthless. Accumulated in the drawers of our brain, it could and should have the creative use. Creation is in our nature. Creativity is a contribution of an individual to the mankind – knowledge in use becomes a common technology; the use of knowledge becomes an experience, and an experience becomes knowledge. In fact, knowledge and experience are inseparable whole, because without experience there is no practical knowledge. Isn't that the reason to choose a proactive way? To work means to revive the knowledge. If you do anything, you not only revive the knowledge that you have, but also create new knowledge, you innovate. Through innovation, man has practiced doctrine (the finding of tools) and the arts (painting, drawing), which is exceptional human activity. The man is a unique being because he has an ability to create under the wing of science and art. In my opinion, they are intertwined, inseparable, and it is difficult to draw the line between them. First of all, because they have the same root: the ability to imagine the future, to predict what can happen and to prepare for it. In creating a future vision equally

important were the arts (painting, for example), and the law of gravity. Imagining the future, with the help of tools and images, with the help of knowledge and ideas, the human thought lives and develops.

Our thoughts shape our way of thinking, our telescope of the future. The human thought depends on us and the society. It depends on our (learned) way of looking at things (circumstances). It is a choice: either someone else solves your problems (parents, the state, the government), or you take life into your hands. To take your life into your hands is to be yourself, to be different. Is that easy in today's ready-made environment, where the education has become instant, a template, and even the horror for those who think differently and use their head. This is not just a characteristic of our time. Take the genius of physics, Einstein and many others – who were largely constrained by the school education! Why? People make lesson plans, claiming: *An educated man should know this and that, and now we will tell you what to think about this and that!* There is no research, no description how someone has discovered something, so you can not even think that you could discover something new by yourself. And we all are given the very capable brain. I'm pretty good at the economics, but useless in physics; my mind and my thoughts, simply, "do not work" in that field. I understand macroeconomic models, but the magnificent machines in the Museum of Nikola Tesla that make big sparks are pure magic for me. And Tesla perfectly knew all these forces and principles. How? Probably because he tried in practice to materialize his ideas. That is why I point out the importance of the way in which something is discovered - watching that way you can see that science is a perfectly normal human activity. Even we, the professors, teach our students the facts and ask them just to memorize it. However, it is easy to test whether they remember, whether they memorized, for example, what is photosynthesis?, but - **to understand, to realize** how photosynthesis actually works, that is something entirely different. That is much harder to test! It is easier to give those boring lists for learning, so the learning becomes boring, and later to check and evaluate the learned. Another thing that makes the science "boring" is that it is incredibly easy to get lost in it. The teacher tries to explain something, you do not realize it, you have not heard it, you were not paying attention, and suddenly you're completely lost. It could have happened to everyone learning math? When you are lost, everything becomes meaningless, you turn off even more, so you are even more lost. I believe that this often happens in the scholarly

approach to the science. Today are needed talented and dedicated teachers, but those wonderful people are now rare. I'm not figuring out why, but it's pretty depressing, right? Although, we have *mentality of a pack, herd, group*, or - everybody learns the same, in unison, uniform, ready-made. People are afraid to commit to what interests them, even if only because it is not trendy!? If a man has a history of achievements worthy of respect, give him something new, let him work at a field he is interested in - it is the only effective way. Definitely is not effective to decide, say, that now is the right time to solve a problem, and to "throw" the money at it. The world will not stop, that is for sure, and that is why I am writing this book – not just for the sake of the book, or lesson, or knowledge. What would the world look like if we stopped the fifties, sixties or seventies of the 20th century? Inventions are happening every day of the week, and the journals are publishing them every week of the year. Many of these inventions are small, insignificant, and occupy a very small circles within a specialized groups. But occasionally something amazing happens, such as an invention of the wheel or the steam engine in the past, the stem cells or cure for cancer nowadays.

So again the question arises: why choose a different path from the path of the many? The answer stems from the foregoing analysis. I must add here that the path of creation is also fun, but it takes time to reach that level. Choosing the creation means choosing science and research. Attempts to understand the world have a long and glorious history, which some parts we have already mentioned, from the classical era (and deeper), up to our time. Everyone can do it, everyone who has learned something about tasting wine or cheese, who understands that scientific method means to perform an experiment, to taste the wine and to choose it. What is so mystical about it? Nothing! In the cognitive process - comparing things, a little experimenting, wondering and checking whether this or that is important, crucial ... we learn a lot about relationships, we understand the phenomena, correlations, effects ... However, it is not always easy. But it is challenging, valuable, necessary, inspiring, and never boring! In essence, the method is almost laughably simple!

All presented so far is proving the need to change mindset and education. Who should to change the mindset? One that changes technology, because by changing mindset we change circumstances in which we live.

Changing mindsets is not a natural result of our education. Society does not educate its offspring to choose independence, but quite the

opposite. Parents rarely dare to persuade children to choose their own model of success – they usually let them go down the mainstream. Orientation on the school and university basis, which is pretty bad, does not encourage developing talents among learners.

Today, it is up to the individual to think about the events, about their impact on his life, about the world that surrounds him, and opportunities. That is, the individual has to observe the world in a different way. It is possible to find many events in life that should initiate a change of mindset, only if we respond proactively to life. However, the events themselves are not sufficient. It is necessary to develop the willingness and the constant need to create soil in which thrives best. Sometimes we need to stop, to rest and take advantage of that peace for concentration and meditation. It is essential to analyze the own path, in particular:

1. Which restrictions are imposed on us by the environment, which circumstances and other?

2. The extent to which we understand that it is necessary to respect yourself and to respect others, because we are entitled to a good and beautiful life, and quality time for yourself;

3. How to solve things independently and not to expect anything from others, not even from our family, or those who love us?

4. How much are we aware that our life is unique, as is every other?

5. Do we actually know that we can do so many things successfully?

Changing mindsets is not a one time event. Our commitment must be reviewed many times. Simply put, it is a Renaissance of an individual which should last through lifetime. And when we pull ourselves out of a routine, out of imitation of life and various dependencies - we must persist.

Daily Contribution

Some people talk so sweetly that you are immediately ready to give them the highest position in your company or in another organization, until you realize that their only talent is sweet talking! Impressive education does not always mean the ability to work productively. It is not enough to have ideas, imaginary goals and plans. They are worthless if not exploited, and if they do not yield results. The result is a specific product, whether material or spiritual. Experience teaches us that we should pay attention to what people do, not just what they say. You can not expect to be respected if you have not earned that. Consider this: What are your personal contributions? To the

family? To the organization? To the company? Do you work with a full or with a half-working power? Do you just work off, hoping that others will not notice? Many people say they just 'work off' their job because their position does not bring challenge, hope, nor promotion. This is a dead end. There are many such cases. Obviously, in that situation can not be any contributions.

Our focus on providing the contribution is a key to the effectiveness of own work - in its content, level, standards, and in its impact in relation to the family, the organization where we work, and society. What is our focus? What contribution we want and can give, and when? – these questions we must often ask, and we must stick to them. These questions are directing us towards the outside world, towards the results, and not towards the efforts in ourselves, within an organization or community. Many people are usually focused on the efforts and their authority in relation to the people "below" them, whereby totally ignore the result. Appropriate orientation is the focus on the contribution and taking responsibility for the results. In this way, attention is drawn to the outside world, where results actually exist. Such orientation leads us to the situation that we think - as customers, clients or patients - what is the ultimate reason of what we have to give?

Asking yourself: *What contribution can I give?*, means to seek unused opportunities in the family, in the society, in the workplace. Because, what is considered excellent work in quite a number of jobs, often is only a faint image of real potential that can be achieved in order to give a real contribution. **Contribution** can mean different things. Everyone needs direct results, self-build and self-improvement. If we have no result, then we are probably facing with the problem, because the results are the condition for our well-being. Where there is no result, degradation occurs. These results must not be brilliant. Life is built of small things, just like a river made of its creeks.

Direct results, as a rule, are clearly visible and stimulating. This is how Tolstoy saw the role of these results: *Do you work? Write to me, for God's sake. Do not laugh at the word: work. The work is smart, useful, it is for good, it is great, but to work even a little something, carving a stick or something - that is the first condition for beautiful moral life and, therefore, for happiness. For example, today I worked, my conscience is clear, I feel humble, not arrogant, I feel satisfaction because I'm good.* According to Tolstoy, the work is a condition of happy life: *The only salvation in every*

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life, and especially the city life, is work, work and only work. I hear you say: All this is not comforting. But the thing, I am not that looking for comfort, but to go forward, willy-nilly, you're going somewhere, and the thing is to be marcher droit (to go ahead). And when you go the right way, it will be very comfortable and pleasant. I say this from experience. I feel that way right now. I live very nicely. I do not see anyone but Aleksander Petrovic, whose abilities are very limited, and if I believed in happiness, that is, if I thought that it is necessary to seek and desire, I would say that I'm happy. I do not notice how the days pass, I do not think what will be out of my work, but I believe that I do what I need to do, which requires of me what I was left to live.

We must not ignore the daily activities, daily routine, systematic and perseverance. One should have a vision, which is realized with time. One should not forget that very important in life are little things! Life is a collection of little things, rather than global visions and plans. For example, CEO of Airline Company can have brilliant ideas, but if he has clumsy flight attendants all goes down the hill! Why? Because you and I and passengers – the consumers – do not communicate with managers, but the flight attendants.

7. TECHNOLOGY AND THE POWER OF KNOWLEDGE

Throughout the history, technological improvements (innovations) led to a number of events that have changed and determined the directions of human progress. This was not a common, everyday progress, but a set of key events that enabled the growth of the human race. Those are simply occurred and sudden "explosions" of energy, released from these great and amazing technological achievements. When such achievements happen, no matter how revolutionary at the time, they afterwards merge in a cumulative human progress. For example, the invention of wheel was the revolutionary progress at the time. However, people today do not even think about it although that invention has deeply changed the industry and all the other spheres of life. Similar was with invention of a steam engine, an AC motor and the others... A wide range of new products, and old improved products, has become accessible to a far greater number of people. Particularly improved was the third dimension of the economy - trade with an increased performance speed of transactions and the reduction of product prices.

As of now, the last revolutionary technological progress has been made in data transmission, the materials through which data circulates, and the formats where data is stored. Far greater amounts of data can be downloaded, stored, processed and made available for use than ever before. Also, data can be quickly and effectively transferred. The most significant feature of this revolution is its global reach and reduce of the gap between technological innovations and users. The explosive growth of information and communication technology has laid the foundation for the global economy in two ways: 1. The effectiveness on the money market, and 2. The changes of the market concept, and the types of relationships between business entities. The market extends to endless virtual space.

Simply put: today's technology is mostly determined by the space in which we live in. It has always been on a frontal wave of changes, particularly nowadays. Technological progress has its price, like everything

else. This is the reason to continue a fierce debate about technological impact on our lives. These debates last for ages.

Chinese wise man **Chuang Tzu**, who lived in the 4th century BC, left the following story about technology:

- Tzu traveled along the south bank of the river Han, when he saw an old man preparing his fields for planting. He had hollowed out an opening by which he entered the well and from which he emerged, lugging a pitcher, which he carried out to water the fields. Grunting and puffing, he used up a great deal of energy and produced very little result. *„There is a machine for this sort of thing,“* said Tzu. *„In one day it can water a hundred fields, demanding very little effort and producing excellent results. Wouldn't you like one?“* The gardener raised his head and looked at Tzu. *„How does it work?“* *„It's a contraption made by shaping a piece of wood. The back end is heavy and the front end is light and it raises the water as though it were pouring it out, so fast that it seems to boil right over! It's called a well sweep.“* The gardener flushed with anger and then said with a laugh, *„I've heard my teacher say, where there are machines, there are bound to be machine worries; where there are machine worries, there are bound to be machine hearts. With a machine heart in your breast, you've spoiled what was pure and simple; and without the pure and simple, the life of the spirit knows no rest. Where the life of the spirit knows no rest, the Way will cease to buoy you up. It's not that I don't know about your machine – I would be ashamed to use it!“*

And what is happening today? Machines now affect almost every aspect of our existence. They have enormously increased our productive capacity. Furthermore, they shape almost every aspect of our lives. The problem of the previous story is still interpreted: according to some, the mechanization has brought many benefits to a man, and allowed him to become the master of nature; according to others, the price of progress is high, because it has brought the rationalism into the human spirit. No matter what attitude we possess, the influence of the machines on the work, imagination, thinking, feeling, etc., is huge, and long-lasting. This influence is manifested through a mechanical interpretation of the world, even through mechanistic explanations of the human brain and human behavior. In addition, the world is modeled after the principles of mechanics: many social institutions are based on these principles, just as the many organizations are formed by these principles (both productive and service).

People come to work at a certain time, they perform a routine set of activities, they take a break at a certain time, and then they continue to operate until the end of the working day. In many organizations, one shift of workers replaces another at the same schedule, so that the work can be continuous for twenty-four hours each day during the year. Usually, the work is mechanical and repetitive. Organizations are designed like machines, expecting from their employees to behave and work as if they were parts of these mechanisms.

The economy was explained by mechanic principles until the 20th century. After invention of machine and expansion of its use, especially during the Industrial Revolution in Europe and North America, the concept of organization has become mechanistic. The use of machinery, especially in industry, required that the organization accommodate to the needs of machines. Factory owners and their engineers realized that the efficient operation of their new machines required major changes in the design and the work control. The division of labor, promoted by the Scottish economist **Adam Smith** in his book *Wealth of Nations* (1776), led to the specialization, and supported the mechanistic concept. An organization that has used the machine, more and more became a machine itself.

During the 19th century, there were many attempts to establish and promote the idea that could lead to the efficient organization and management of work. In 1801, **Eli Whitney** presented a public demonstration of mass production, showing how firearms could be assembled from replaceable parts. He was a pioneer in the conveyor belts application in the industry, enabling reduced costs and time savings compared to the preceding craft production. **Charles Babbage**, the inventor of the early type of mechanical computer, has published a study on the scientific approach to organization and management, where he pointed out the importance of planning and the appropriate division of labor. However, these ideas have systematized into a comprehensive theory of organization and management no sooner than at the beginning of the 20th century.

Spiritual work is increasingly adapted to the powerful industrial activity without the tradition and taste. When using machines, the joy and calmness disappear. The same applies to the management of time. Most of the time it is swallowed by the machine, because losing one hour, one day or one week is a huge loss, and the machine can not tolerate delays. The West has torn the time on small pieces, and each receives a value of the dollar. So

the industry stopped suffocating the personality of employees. Forgetting a personality is a failure of mechanism. Personality is a condition of existence, as the air is essential for breathing. We all need to feel free to live and develop, to be aware of our strength, and to build our innate laws so the being and its activity could be in a worthwhile relationship. Solution to this problem is not the capitalist materialism nor the cold Newtonian mechanics!

The technology has seriously stepped out of the mechanism's frame. Discussion on the technology can not obscure the truth that the technological development in the post-industrial world has the greatest impact in the field of information and communication. The information revolution, with its American roots, has spread over the globe. Millions of people around the world are computer literate. Europe has outpaced the United States in 2001 in the number of Internet users. Internet opens up a new, enormous potential of knowledge and information, providing fresh perspectives on the world. Huge communication networks make our world and its leaders more transparent. Thanks to the Internet and the other media, more and more people have access to an increasing amount of information on every topics. However, accessing data is easy, but the ability to do something with it is not. The power passes from the hands of those who controlled the information to those who now control the knowledge!

Finally, despite a bitter discussion on the technology, it should be noted that the decisions are not made using technology only, but through people with the help of technology! The technology is in the hands of man, and therefore, the question is: Is an individual for or against the soul, the humanity and the development? Today, more than ever, technology determines the fate of the individual.

Technological evolution, although spectacular, has no power to significantly improve the life of a man in the decades to come. Even a recent innovation (mobile telephone and Internet), which undermined the way of operation and consumption (removing intermediaries in commerce, culture, changing the company's management and administration, stimulating exchanges ...), did not benefit man's life more than the steam engine, or an electric motor.

Moreover, technical progress enables socially and politically negative effects: countless robots replacing numerous workers; Internet facilities and large amounts of data empowering public and private control in monitoring lives of each individual. In addition, networked facilities,

nanotechnology, biotechnology, neuroscience, artificial heart, artificial uterus, cloning and creating artificial organisms, have aroused the irreversible evolution of nature and mankind.

In addition, technical progress has not contributed to preventing the spread of weapons, nor helped to keep the increase in the average temperature of the Earth (three degree till the end of the century); glaciers do not cease to shrink causing the sea level to rise almost 1 meter, threatening to undermine the 136 coastal metropolis (e.g. New York), and other highly populated areas, such as land along the riverbanks of Ganges and the Brahmaputra...

On the other hand, technical progress also has effects which are not negative. On the contrary! Technology particularly helps people to better manage their lives, individually, to successfully cure ourselves, to learn faster, to practice healthy diets; it allows us to have comfortable accommodation, to shop more than ever, to save a huge amount of energy, controlling carbon dioxide emissions and the greenhouse effect, to reduce heavy and boring work, to make products cheaper and a number of services more efficient, to improve health education, to increase the security of justice, to extend human life (i.e. those born after 2050 could live no less than 120 years). Many diseases will definitely be exterminated (leprosy, filariasis, etc.). By 2050, tuberculosis and AIDS may disappear, as well as the fever caused by Ebola... New discoveries in the field of neuroscience may provide better medicines to neurodegenerative diseases, and better use of teaching methods according to the needs of each individual... Learning may become more democratic. On-line training courses will make the best professors available to students all around the globe. Web semantics may enable the automatization and improvement of a large number of consulting services. Cloud computerization should enable numerous applications, especially the sharing of teaching content. Virtual labs with remote control may enable access to expensive experiments and experiences for students and professors in the field of science. The software solution with the 3D effect is available to everyone at affordable prices, with many facilities, bringing a huge explosion of creativity in the design of new products, opening new ways for individuals to express and liberate themselves. Transport may become more intelligent, more convenient, more economical; means of transport - cars, trains, airplanes - may have autopilot system, which would reduce the traffic jams. New buildings may produce more

energy than they consume, transferring the excess energy into decentralized and intelligent network, and may become self-sufficient in the production of the organic food...

The Growth of Creative Powers

The last 500 years are the time of the unseen and incomparable growth of human race. In 1500 the world population was around 500 million people, and today is 7 billion! The total value of goods and services produced by the humans in 1500 was estimated at 250 billion dollars today, while the annual value in the modern age is close to 60 trillion dollars. The human population has increased 14 times, and production 240 times. In 1500, only few cities had more than 100,000 inhabitants.

Until the first decades of the 16th century, no one had not yet sailed around the world. Only when **Magellan**'s ships returned to Spain, in 1522, sailors were able to talk about their trip, long 72,000 kilometers. The journey took three years, costing the lives of many, including Magellan's. In 1873, **Jules Verne** finally created Phileas Fogg, agile, British adventurer, who tried to travel around the world in 80 days! It was a science fiction then! Today, everyone with decent income can easily and safely travel around the world in less than 48 hours! Imagine if we could transfer the modern battleship to the Columbus's era: it would undoubtedly conquer the entire world fleet of the time, without a single scratch! Only five of all modern freighters could transfer the cargo of all commercial fleet at that time. Modern computer could easily store all the books and documents from each medieval library individually, and still would have been enough space. Any sizeable bank holds more money than all pre-modern kingdom had together...

In 1500, people were exclusively related to the surface of Earth, but 469 years later (on July 20th 1969), the man landed on the Moon! Only in 1674, people discovered microorganisms - **Antonie van Leeuwenhoek** peered into his handmade microscope and was shocked when he saw a whole world of tiny creatures twinkling in a drop of water! Thanks to studying the microorganisms, we managed to win most of the deadliest infectious diseases, putting microorganisms at the service of medicine and industry. Today we use bacteria in pharmacology, and also in making biofuels, and killing other parasites.

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The first atomic bomb was detonated on July 16th 1945 in 05:29:45h, in Alamogordo, New Mexico. This American experiment was the most important and the most crucial moment in the last 500 years because mankind gained an ability not only to change the flow of history, but also to end it.

This historical process in the last 500 years was known as the *Scientific Revolution*. The basis of Scientific Revolution is the investment in scientific research. The reason for that is the belief that it could increase the medical, military, and economic power of a mankind. Naturally, the investments grew with scientific results. We would have never been able to walk the moon, or fly planes, or to split atoms, if there was no such investments. The US government, for example, recently approved billion dollars for studying nuclear physics.

This is a time of upheaval in the tradition of knowledge and skills. Premodern tradition of knowledge (Islam, Christianity, Buddhism and Confucianism), claimed to know everything that is important to know about everything. In the past times, several deities one almighty God, or wise men, "possessed" the overall wisdom, which served as a basis for acquiring knowledge for all. It is incomprehensible that Bible, Quran, or Vedas missed some vital secret of the universe - a secret that could reveal a creature of flesh and blood. Therefore, the knowledge about everything already existed, and humans only have to respond to the requests of the authorities!

Despite this understanding of knowledge, even in the most conservative, God-fearing era, there were people who talked about more important things which, however, were still unknown. Such "blasphemers" were usually expelled or persecuted - or they established the new traditions by claiming that they were the ones who knew everything there was to know. For example, Prophet Muhammad, who founded a new religion, claiming he knew the divine truth and that there was no other truth about it except what he already knew.

Modern science differs from all previous tradition of knowledge in three key reasons:

- *Willingness to accept ignorance*. Modern science is based on the Latin proverb - *ignoramus* (we do not know), which means that everything is still unknown to us. However, thinking that what we know may turn out to be wrong when we acquire more

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knowledge, is also accepted. Idea or theory are not holy, and not subject to change.

- *Central role of observations in mathematics.* Accepting ignorance, modern science tends to gain a new knowledge. This leads to collecting results of observations and using mathematical apparatus for connecting these observations into meaningful theory.
- *Acquisition of new power.* Modern science is not content with creating theories. It uses theories to acquire a new power, and especially to develop new technologies.

An example of a new scientific method is to present the General theory of motion and change. **Isaac Newton** published it in his *Mathematical Principles of Natural Philosophy*, probably the most important book of modern time. The importance of Newton's theory was in its ability to explain and to predict the movement of all celestial bodies in the universe, from falling apple to the shooting stars, using three simple mathematical laws:

$$1. \sum \ddot{\vec{F}} = 0$$

$$2. \sum \ddot{\vec{F}} = m \ddot{\vec{a}}$$

$$3. \vec{F}_{1,2} = -\vec{F}_{2,1}$$

Today, a giant step in the scientific progress we embrace with so much enthusiasm! Take the example of the scientific phases of electricity, in the 19th and 20th century: **Bell** and his invention of voice transmission over long distances; **Edison** and lighting using incandescent fibers; **Brush**, the great pioneer of arc lighting; Thompson, who gave us the first practical machine for welding, contributing exceptionally to the development of

several branches of science and the economy; **Westin**, the first designer of dynamo-machine; **Sprague**, and the success of the practical electric railways; **Acheson, Hall, Wilson**, and all others who brought a revolution in the industries... The work of these talented people is not over. Now many others work on exploring new areas and discovering the powerful and promising fields of science.

The ray of creation, inflamed in ancient times by the noble reformers and philosophers, has awoken the philanthropic spirit. The spirit that leads people from all classes and positions, not to do it just for material benefits or compensation - although their common sense may require - but for the love of success and benefit of all other people. Collecting and disseminating knowledge is their superior motivation, because the authentic creator is only the one that inspires other higher and noble feelings, and sees far above earthly things.

The link between the scientific revolution and the economy, among all branches of research, many sectors of the economy, old and new, we can see most clearly in the field of energy. If we want to break free from poverty, if we want every individual to have what he deserves, what everyone should have for a safe and pleasant existence, we need more machines, more power. But resources of coal and oil are not infinite. On the contrary, the Earth's resources are increasingly depleted, and demand for energy is growing. Scientists are seeking for new sources of energy, and ways to use water and energy of the Sun, the energy of splitting atoms, and their new quests never cease.

Taming the Energy of Nature

One of the greatest inventions in the history of civilization is the creation of energy. It took a long time to realize the real potential of heat in creating energy, although converting heat into energy was before man's eyes for centuries - the simple use of a fire in the kitchen. Partial breakthrough of converting heat into motion has enabled the invention of gunpowder in the 9th century in China. Sixty years later, the gunpowder was used in artillery, to launch missiles. Even then, the idea of converting heat into motion remained far from common sense. Three centuries later, people have designed a new machine that used heat to move bodies.

What might be called the first well-known steam turbine was made by **Heron of Alexandria** in 120 BC. It was a small ball-shaped tank with

two nozzles that turned the device around its axis while heated. The second one, which had the practical application, was made by pharmacist **Giovanni De Branka** in 1629, which was moved by the pharmacy mill. The emergence and development of thermodynamics has enabled the scientific development of contemporary heat pumps. The modern steam turbine was invented in the late 19th century, when several inventors and experts left a trail. English engineer Sir **Charles Parsons** has patented the first reaction turbine in 1884, in which the steam was processed in several steps. During the 1880s, the Swedish engineer **Gustaf de Laval** patented a large number of impulse steam turbines that operated with 40.000 rpm, with accelerators for high speeds in convergent-divergent nozzles. Around 1900, the largest installed power of steam turbine was 1200 kW, while ten years later it was 30.000 kW! Today's conventional blocks of high power operate with 600 MW, while the blocks of maximum power reach 1.500 MW.

The new technology of the steam engine was created in British coal mines in the 19th century. As the British population grew, their forests were increasingly cut down, because the wood was the raw material for a growing economy. True, and the expansion of agricultural land has often been the cause of deforestation. Soon, Britain was faced with lack of wood, which was used for heating and other purposes, so people began to use coal as an alternative. Large coal deposits were located in areas saturated with water, but floods prevented access to the miners in the lower layers of the mines. In addition, demand for coal was growing, and replacement for manual power miners to increase production was desperately needed. This practical problem required an urgent solution. Luckily, the steam engine appeared around 1700. It was not sufficiently functional but able to convert heat energy into motion and increase coal production.

Steam engine was improved, taken out of mine shafts, and connected to weaving looms and coils. This brought revolution in textile production, allowing production of greater and greater amounts of cheap textiles. Soon, the steam engine was used to upgrade mining wagons, and later the trains.

Since then, people have become obsessed with the idea of using the machine for converting one type of energy to another. Today, any kind of energy could be used for any need, if only we could invent an adequate machine. For example, when physicists discovered that a huge amount of energy was stored within atoms, they immediately began to think how to release that energy and use it for generating electricity, moving powerful

submarines, or even destroying cities. Six hundred years have passed since the moment when the Chinese alchemists discovered gunpowder until the moment when Turkish cannons tear down the walls of Constantinople. Only 40 years have passed since the moment when Einstein proved that any mass can be converted into energy ($E=mc^2$), until the moment when the atomic bomb wiped out Hiroshima and Nagasaki, and nuclear power plants sprang up like mushrooms after rain, all over the world.

Understanding the Strong Influence of Scientific Revolution

The path from scientific discovery to technological and technical inventions, their use, understanding and acceptance, usually is very long. Discovering the laws of quantum physics (free-fall, solar system, speed of sound and quantum theory) was a major step in science, but their understanding and acceptance went very slowly, causing many turmoils in the society and culture. When those discoveries took an important place in human civilization, they were overshadowed by new discoveries, drawing a new attention, and bringing new changes in human consciousness, culture, and life. That was in case of the Theory of relativity, particularly the fission (splitting of atoms) that still provokes fear and problems in modern man and modern society. As previously mentioned, apart from electricity generation or rocket propulsion, the fission has an inhuman dimension - the application of this discovery for the production of devastating nuclear weapons, and creating problems of nuclear waste, is threatening to the environment. The development of nanotechnology (one nanometer is a billionth of a meter) enables a huge field in detecting the small particles and their structure, which will have wide application in the development of modern techniques, especially in computer science and digital equipment. There are also attempts to develop the fusion (bonding atoms, which is opposite to fission) in order to produce energy without devastating consequences. We should mention the changes in biology, medicine, agriculture and so on, caused by the discovery of the genome structure (DNA). Application of this discovery provokes excitement and fear at the same time.

The important question for us is: How much and in what way these scientific discoveries and their application in the form of technological processes and technical achievements, affect a changes in mindset? Certainly a lot, since great scientific discoveries cause changes in the way of looking at society, at ways and depth of reflecting the reality.

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We said that the steam engine, and then electricity, caused the development of industry and transportation, changing the way of life and human consciousness. Let's see how this manifested with the emergence of an entirely new society - *industrial society*? The application of scientific achievements leads to the formation of large industrial facilities, which are able to produce a large number and wide range of products. There is a factory production, created by a large number of workers performing particular operations that lead to the final product. Industrial production has suppressed old craft production in which one or several artisans were making their products in a longer period of time. Now the time shortens on hours and minutes. Industrial production employs a huge number of workers and begins a mass industrial production, which includes trade, transport, and energy.

The development of industrial production brings a complete change in the character and structure of society. The feudal structure of society dissolves, creating conditions for the capitalism, with owners of factories, industrial plants, banks, chain stores and other new forms of ownership that enables massive industrial structure, with rapid urbanization and urban development, rapid decrease in villages and rural areas. Feudal estates become less powerful, and the balance of power moves to the industrial production and financial capital. In social terms, a new class appears - the working class - consisting of peasants and former servants in feudal estates and noble houses. The working class became the largest social category in the exploited and humiliated position. This process was taking place during the 18th and 19th centuries in Western Europe and America, expanding to the rest of the world in the 20th century.

Scientific development and advancement of technology and technical achievements are constantly accelerating in the modern society. There is also a sudden shift from classical industrial production towards IT, digital and robotic methods of work and production. In industrial plants have installed robots and other programmed, digital and digital-organized methods of production, leading to even more massive production, reducing the need for workers; new techniques and technologies relocate men from the factory production process to the commanding position in robotic factories, and workers lose their jobs en masse. Industrial production narrows, but the service economy (trade, transport, insurance, banks and other service sectors) expands. There are talks about the tertiary sector

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economy, a new economy with the focus on financial and banking capital, and where informatics and digital techniques progress. All these operations, including the Internet, bring huge profits. Therefore, this type of society is referred to as the post-industrial society, because it represents a shift of dominance of the industrial mode of production and industrial capital.

Science affects the education, continuously providing new incentives and educational tasks in order to reform, modernize, develop, adapt and technically train, becoming more practical and more applicable. Schools, universities and institutes are constantly improving, and applying scientific and technological discoveries. In the modern society is evident domination of knowledge, information, and skills. And the capital growth follows them. Therefore, the industrial society is inevitably transformed into the knowledge society.

9. WHAT COMES FIRST – AN INDIVIDUAL OR A SOCIETY?

Creation, creativity, innovation, democracy, trade policy, state, etc.. – all these are products of imagination of individuals, or the human capacity for imagination and creation. Imagining unseen (abstraction) is what separates humans from other living beings, but also the creator from other people. It is important to note that subject of imagination, what an individual reveals with the help of imagination – is his own epiphany at the given moment. Michelangelo's *David*, Leonardo's *Mona Lisa* would have not been exceptional by the very nature of their creativity, if they were created by different people at different times! Have you ever seen two *Davids*?

Could this characteristic of creativity be applied to the creative innovations in business? Definitely yes! A new idea in business is always individual! (We are talking about ideas that are successful, that have found its customers). How many people are trying to write or paint? Many of them are gathering, even daily, at the art centers, such as Paris or Rome. However, only gifted individuals succeed because they are talented! Let's look deeper into the layers beneath imagination, below the surface. How it breeds? Just through observing nature? Is the contemplation sufficient? How to "sharpen up" our thoughts? Henry Moore, an anthropologist, believes that human hand is a knife edge of mind. Many agree with his assertion that nature can be understood through a much deeper action, through direct contact, through the creation of the nature in any way. According to this, the hand is more important than the eye, and that is what the effort of Western civilization is based on. European civilization of the Middle Ages and the Far East civilization believed that the world must be **seen and understood**, therefore, the science was taken much more mysteriously. According to the western understanding – an experiment is the dominant scientific method. However, the diversities between these two approaches are not so clear. The prevailing fact is that in the evolution of human, the hand led the evolution of the

brain, not coincidentally. In other words, the creation of tools - which happened through observing the nature and looking for a way to overcome it (which was the technology of that ancient time) – a human brain was developing simultaneously.

A hand that sharpens the mind is our direct connection with nature. It helps us to consolidate our ideas, to perform an experiment, to discover the secrets of nature, which - when introduced – could be used and adapted to our needs, due to our mind process. Through learning and creating, our society was developed in several stages. Today, in the world of technical equipment (computer, phone, car, household techniques ...) the ideas increasingly fade, the creation dies, obstructing creativity, and human mind suffers. People are lulled into comfort. A man of middle class now has a better standard than the king of France had in the 16th century.

Some authors describe the society of recent history as a theater (often burlesque), where people play different roles, carrying all sorts of masks. *Today's era (in the world) fabricates men with human masterpiece and craftiness, such as diamonds are fabricated with its dust. Thus today's man is appreciated like diamond, that is, if a man or diamond has many faces (facies), he is more expensive.* (Njegos)

Clearly, the mind of youth greatly suffers, because it lacks the desire to enter into the depths, into the core of things and phenomena that are hidden below the surface; there is a kind of inertia in life and creations. An ability to imagine and dream is retarded. The fact is that imagination boosts the energy of youth and initiates the creativity. Have you ever considered why is this happening? Why is humanity, that has created houses and bridges and aircrafts, sinking into lethargy? Why is the number of creative individuals decreasing, when there are so many advantages and benefits for research and discoveries? Why is the development slowing down? Why is fortune equalized with money and material things? Why is the spiritual capital not recognized any more? Why is the spiritual capital not accepted as the wealth of which we can live, the wealth that enriches the deeper aspects of our lives? It is the wealth that we gain by relying on our deepest meanings, the highest values, the most fundamental purposes and the highest motives, by finding ways to build all that in our lives and our work.

It is important to identify the constraints that have appeared in the social development and are acting until this day. The aim is to point them out, because this book supports those with entrepreneurial thinking and de-

sire to be different. Because if we think and talk like the most, we will probably never open a new door. Specific restriction is the **state of modern capitalism**, which will be particularly analyzed in this book. There are two great limits of creation, within the individual and within the society: the **lack of knowledge** (theory) and the **rigid social structure** (centralization).

Both limits could be manifested on the example of the once-great empire of the Incas. Interestingly, the Inca civilization did not know the literacy, nor possessed a book until 1500 BC (the time when it was conquered by the Spaniards). The supreme ruler (tzar) of the Incas was illiterate, same as his poor subordinants. Therefore, the lack of theoretical knowledge was obvious, but the Incas were skilled in masonry. They built imposing stone castles, irrigation systems, suspension bridges, and the like. However, they did not build arch bridges, nor they had any knowledge about the wheel. It was a civilization that never wrote anything down, but on the other hand, they lived on solid state structures. Everyone took care of everyone - farmers, craftsmen, soldiers – and everyone served to one man, the supreme Inca. Well-known scheme: the tzar (ruler) takes care of his people, serves them, gives them jobs. The ideal of prosperity! Everything is provided from the top, everything is stable, and each member of the empire is happy and satisfied. The Incas lived on the territory between the Andes and the Pacific Ocean, 5,000 km long. Their reign lasted until 1452, when the Spaniard **Francisco Pizarro** conquered it! An empire with hundreds of thousands of soldiers was beaten by illiterate Spaniard with 62 horsemen and 106 foot soldiers in just a few days!? I started looking for the reasons for such a strange and unusual disappearance of the Inca Empire in my high school days, when I wrote the graduation paper on the discovery of America with my mentor, the great professor Desa Vucinic. It took me a long time to realize that the pillar of every society is science - not only practical, but also theoretical. Maintenance and development of the society requires theoretical and practical knowledge. Development of the Incas was based on the practical knowledge, on the work of hands, but Incas never managed to discover and develop the use of brain. Someone else, who had a different organization, was able to invent the wheel, the arch and the letter. The question that follows is: why the Inca empire did not have theoretical development of science? The answer is, of course, in that other restriction of development: centralization of the empire. Centralization in the society creates a pyramid of hierarchy that eventually loses its flexibility and ability to change. The same

happened to many large hierarchical corporations that have successfully worked for centuries and then disappeared in the 20th century because of the inflexibility. Centralization by its very nature means strong concentration of information at the top of the pyramid, and thus the decision-making and the power. All information start from the top, from the supreme authority. The stability of the pyramid is not in its basis, which would be natural, but everything is subordinated to the central government. So, when working for someone who is above the hierarchy, the behavior and thinking is adapted, consciously or unconsciously, to the one who is above the hierarchy. In case of the Inca emperor, everything was done to his satisfaction. In such system, the behavior and actions are directed towards the expectations of the government. The man does not work for himself but for the others, and his way of thinking is strongly influenced by ideology or politics of the ruler.

The same was with the Aztecs. (It is amazing how the Incas and the Aztecs had little interest for the world around them.) If the Aztecs knew what the Spaniards did to their neighbors, maybe they would have resisted the Spanish conquerors more vigorously and successfully. Before the conquest of those empires, the Spaniards have conquered most of the Caribbean islands and introduced the unscrupulous rulership. The Aztecs did not know anything about it. Spaniards used similar methods with both, the Aztecs and the Incas, in order to win their territory: they noticed that their organization was strictly centralized, so they killed the rulers, causing virtual collapse of the empires.

Centralization of knowledge is only partly possible, but centralization of all knowledge is unsustainable. Just because the knowledge is scattered, and because no center could have sufficient capacity to store it in one place, because there is only one language that knowledge could be expressed and transferred to that center, there is no motivation to move that knowledge towards the control center. In his truly iconic and highly cited work *The Use of Knowledge in Society* (1945), **Hayek** proved the theory of decentralization, which was earlier formulated, and according to which the decisions should be (dis)located in places where there is knowledge, because it is the optimal use of *scattered but non-transferable knowledge in a society*. Hayek analyzes, as a huge social potential and advantage, the possibility to achieve the highest performances in decentralized systems. Due to the non-transferability of knowledge and its inability to concentrate on the chosen points (centralization), Hajek suggests moving decentralized decision-

making points towards the points where the knowledge is located by the nature of things!

In most cases, centralization has the same consequences: dependence on the center and decreased information flow, which reflects negatively on the parts of society and individuals. This stifles initiative; also, the information and knowledge are controlled before they reach individuals, the freedom of choice is lacking, and life goes through the isolation of individuals and feud between them. Are there more consequences of centralization in previously described situation? If you do not think for yourself, if your desires are repressed, if you do something just to please someone else, what happens? The creative germ is killed, the imagination is killed, there is no vision or strategy based on the freedom of choice. Moreover, there would be no pleasure in what we are doing. Creation (science) is the most beautiful human activity. The existence of pleasure, and desire for greater pleasure, is the basis of the art and the scientific method. In feudal societies, science was not flourishing, nor was art. The characteristic of that society is stagnation: there is no power for action that pulls forward. No new ideas. No development. No historical processes. And these processes are run by learning, communication and openness.

Expanding the spiritual horizons, however, heavily depends on the practicality. Clearly, the accumulated knowledge, which is written in the books, is not sufficient for solving the problem. The knowledge in the books is about the past, and we are preparing for the future. Scientific papers and academic literature generally interpret how something has been done, how the knowledge was gained – all that have happened in the past. That valuable knowledge should not be discarded, because certain trends from the past are continuing. They allow us to project the scenario of the future with greater certainty. However, that knowledge does not help us to explain the future. Generalized knowledge about the past, conveyed by impersonal and unimaginative teachers, is a heavy burden that presses the idea and vision. Diagnosing problem returns the particular individual to the present tense - here and now.

Paracelsus said that treating the disease depends on the diagnosis. Therefore, it is crucial to define the problem. Paracelsus was a famous physician in the 16th century, who broke the tradition of "bookish" treatment of the disease. According to him, there can not be a surgeon who is not a doctor (diagnostician). But if a doctor is not a surgeon, then he is merely an

ignorant, hairy monkey. This leads us to the need for situational knowledge. Uniformed knowledge is a little help in solving the new problems that life brings. There are many textbooks full of descriptions, charts, models, figures and various claims, concentrated on the past, and, with each new day are increasingly away from the reality in which we live, and which certainly can not be seen and understood through the prism of ideas of the past. It takes practicality, which is imposed at the moment of solving the problem. Trying to overcome the previous defect using the cases of the best practice is not of much help, because the situation changes, so the former "good practice" does not exist today - therefore the diagnosis of books or texts of former economist can not be applied in solving current problems. Thus, textbook or uniformed knowledge does not contribute to development, because it does not allow the originality, and without originality there is no development. We can hardly speak of a contribution based on reporting about already known, already gathered information. There is no room for personal contribution. We should not underestimate it all, however, but if we remain within that knowledge (already known), we are simply spinning in circles. There is no contribution, no creativity, no invention. What is the pleasure of creation? What is a reflection of our personality? While creating, man creates his own self, because he must have personality, attitude, dignity, thought and character in order to contribute! An idea of a strong personality is a value ownership - different, unconventional, brave. If we join the mass, we lose personality. We lose individuality, we become members of the crowd. Losing personality abolishes the most important value – humanity, with all its characteristics. Consequently, a man becomes just a copy, or pale image of what he could be, or just the face the same uniform – an impersonal being.

Why is there a material poverty of particular nations? Is the spiritual poverty the reason of this condition? Why did the tectonic disturbance happen in the world's economy after 2007? And now - how many almost identical explanations have you heard about the causes of the recent financial crisis? And why? Here's why: they have been learned from the same book or political agenda! For example, how many experts contributed to the information on the causes of that crisis? Even greater problem is that these experts educate young people using methodology "reproducing the reproduced". In this methodology, the past is often portrayed as the future!

Stifling individuality is a problem in any society, organization, company, and family. Stifling individuality is a stifling life. Generally, it is cru-

cial for every society to protect the opinion of minority. Therefore, the role of institutions is important and necessary in the individualization of society and the protection of individuals who do not fit into the majority's perspective. Institutions create democracy, and democracy means tolerance, and a difference in opinion. In the societies built on democratic principles, the people who do not follow the opinion of majority enjoy the equal rights, however, their ideas are applicable in various fields. Have not the Reformation and the Renaissance proved that? The Reformation began in 1517, with the changes adopted by Martin Luther, and according to many, those reforms were larger and more significant than the earlier religious reforms and political movements. They have given new perspectives on nature, life, and universe. Center of that historic movement was Basel. One of democratic institutions of that time is the University of Basel, which allowed diversities among professors, employing people who gave up on uniformed access to education, people with individuality. Nurturing their personality, those professors showed vision, approaching the reality in a completely new way.

Nicholas Copernicus has changed the paradigm on celestial bodies. In his book *The Revolution of the Heavenly Spheres* (1543), he concluded that the Sun was the center of the universe! This is truly a revolutionary discovery, because it fundamentally changed the perception of the solar system. Before that, people for centuries lived in misapprehension, building the development of natural sciences on the mistaken paradigm. All of a sudden came such an enlightenment, changing the old myth that the Earth was the center of the universe, opening new doors in science. These and many other findings emerged on an accelerated pace. Year 1543 is significant because of publishing of the two books: *Anatomical Drawings* by Andrea Vesalius, and the first translation of Archimedean *Mathematics*. This year and the 16th century were groundbreaking era, moving from so-called collective experiences, or from the discovery of the hidden structure of matter obtained during collective practice (e.g. the discoveries of stone tools, metal, fire, domestication of animals, growing plants, etc.). Rotation of the Earth around the Sun could not have been collectively discovered.

In the West, Humanism, Renaissance, and Reformation have put an individual in the focus, and the organization of society, companies, groups, and individuals has favored an individual. Another deep change was achieved due to the transformation in the mindset, and the economic and cultural progress. A fundamental change of mindset that occurred due to the

discovery of Nicolaus Copernicus, coincided with Martin Luther's thought that God is not only the Creator but also a man. Luther raised the faith in the individual on Earth, that is, he lowered the Creator among us. An individual has returned to his essence, the Universe has descended into a microcosm. A strong ecclesiastical bureaucracy failed to stop the tide of the change; not even with prosecution of Nicholas Copernicus, or inquisition and persecution of individuals who believed in newly discovered. This means that religious paradigm was abandoned. West has abandoned the collectivism, finding a gap for individualism.

Societies that have never experienced the Renaissance, continued to ignore science, research, innovation, entrepreneurship, and creativity. They have never realized the necessary transformation, nor understood that knowledge is an individual thing, although the religious paradigm rests on an individual - God. The result is visible: such societies are underdeveloped because they simply have not caught momentum of individualization, remaining largely in the maelstrom of collectivism. After the Renaissance, through the cycles of industrialization, mankind reaches modern capitalism.

Pessimistic Version – State of Modern Capitalism

Modern capitalism, as currently defined, includes only two basic assumptions about the man or humankind: 1) human beings are primarily economic beings which, according to Adam Smith, have a *natural tendency to trade, barter and exchange*; and 2) human beings always act so as to follow their own rational interest or, at least, the hints on what can bring them benefit. At the business level, this is manifested by the principles of the search for profit, for the sake of profit, and the assumption that every business strives to maximize its own interests and profits of its shareholders. These fundamental assumptions are boosted by intellectual trends, such as Newtonian mechanics and its associated technologies, as well as Darwinian *struggle for survival*. The capitalist original laws on competition, profit and capital accumulation, have captured today's capitalism and transformed it, according to **Zohar Danah**, into *a ruthless pursuit of competitive advantage in a world whose resources its own practices are constantly diminishing*. That is over and over the most frequent issue - the sustainability of such a system. The questions on the exhaustion of remaining resources are at the

surface, as well as supporting and threatening consequences inflicted on the environment.

The power of today's governments is decreasing. They are losing control over demographics, technology sector, finance, employment crisis, growing violence, and degradation of the environment. They have fewer financial resources to respond to the multiple challenges. Around the world, countries continue to lose control. The public debt of the world have reached 54,000 billion in July 2014, or 72% of world GDP (the same year). Many governmental sectors are very responsible and dormant due to its sclerotic bureaucracy.

In many democracies, leaders are obsessed with short-term effects of their decision-making, ignoring the long-term consequences of their decisions, and avoiding unpopular decisions. Reaching major state declarations decisions is not possible without the influence of corporations, which prevent everything that does not suit them. Even in the richest countries, the state manipulates a substantial part of the wealth produced each year; increasingly inefficient and indifferent to the future. Indicator weakening democracy data on public debt shows a constant increase: the public debt in the United States was 100% of GDP, 96% of the euro zone, 89.5% in the European Union (2014).

Member countries of the European Union are trying to use many means of action, and some of them even the currency, or monetary policy, although they lack the vital functions at the state level. In France, the executive authority has lost numerous means of controlling the country's fate due to the maintenance of European standardization, privatization and decentralization. Many other European countries sell their public infrastructure (Greece, Portugal, Spain and Italy). For example, Greece sells 38 airports, 700 km of highways, 12 ports and a single company that produces two-thirds of the national electricity! In Spain, the government excludes the health system, and organizes the privatization of 46 airports. Such approaches can not bring any improvement, but continue to reduce state budget.

In a number of countries on other continents the state is even more powerless in dealing with issues of the future, unable to provide public service, to maintain the infrastructure, to pay its officials, politicians and soldiers, and even to fight epidemics, trafficking, mafia, terrorism ... In

addition, the state can not even help its citizens to choose freely their lifestyles.

In countries where the state is particularly weak, as in Somalia, the Democratic Republic of Congo and South Sudan, the situation is chaotic, often "in the name democracy". Argentinian authorities have announced inability to perform their duties. Mexico, with 9 out of 50 the most dangerous cities in the world, is unable to stop the drug trade. In Rio de Janeiro, millions of people live deprived of public services in about 700 suburbs. In India, about 680 million people have no access to health care, education, drinking water... There is no indication of overcoming these difficulties.

Particularly expressed are nepotism and corruption: billions of dollars in bribes are transferred to the government officials every year. In Africa, having 12 of 14 the most corrupt countries in the world, every year 400 billion dollars are diverted abroad, of which 100 billion just from Nigeria. Nothing suggests that this situation could be improved. In the decades to come, strong market growth ends with the weakening of the governments, the market becomes more global, while the state remain (or becomes) local.

After the completion of the US-Soviet bipolar hegemony, there are no coalition forces to take over the strong global coordination. Instruments of the global policy management proved ineffective. No one wants to be the world's gendarme. There is no international institution sufficiently capable to manage the world order and peace. Civil war in Iraq, Syria, Kurdistan, Central Africa, the Israeli-Palestinian conflict, the hunger in Southern Sudan, the failure of the UN in Ukraine, the heart of Europe, indicate that none of these authorities has been able to ensure peace and security in the world, nor to guarantee safe environment.

G7, G8 and G20 are only hypocritical opportunity for photographing and presenting empty promises. For almost twenty years, there was no progress - neither economic, nor political. For example, Kyoto protocol on the control of carbon dioxide emission and greenhouse effects, technically came to force in 2005, but was not implemented due to the refusal of the United States (with 23% emission of FES) to conform all limitations.

Faced with a vacuum between the institutions at national level and international level, companies increasingly take the power over the people's lives - 2000 largest companies in the world have growth at least three times

the size of population, which certainly provides them a planetary hegemony in many sectors: monitoring the health care, changing the education and the other. They now (and in the future will less) rely on the country's fate. Moreover, technologies are relentlessly given to the market, even in the prerogative countries, forbidding the right to choose language, to approved diploma, to authorizes drugs, to set standards, or even to command the army.

Although some companies have long-term plans, although some of them deal – due to its own interest – with planetary issues and generations to come, most of them are obsessed with the need for current financing, profit of shareholders and the general issues that affect them. Their capital and employees are becoming less and less attached to the nation-state, their seats are repositioned where the laws are more favorable, where the taxes are lower, and this, logically, destroys the country. Unemployment, the main enemy of democracy, is growing.

Generally speaking, the market is unable to substitute state at the global level. Companies and the state, the market and democracy, are threatened by disagreements, secessionism, terrorist groups, and criminal gangs. Separatist movements, peaceful or violent, are strengthening in Ecosse, Catalonia, India, China, Ukraine, Russia, Africa and the Middle East. The limits set out in the 19th and 20th century are no longer respected. Terrorist groups, used for camouflaging the criminal activities of politicians, are profiting by multiplied connections with international exchange.

Illegal economy and crime all are making people's life difficult. The rule of law is questioned, especially the property rights. Counterfeiting is becoming more widespread. This has contributed to the explosion of commercialization of women, children, and human organs. Trade of illegal substances, human organs and people, is getting more terrible and ubiquitous. Every year, cyber crime takes 750 billion from enterprises who are victims, and that number is growing.

The world increasingly resembles Somalia at the end of 1991, when the country lost all means of applying the rule of law and, in particular, when, after a failed attempt (1995) US-UN forces to re-establish order, the government of Somalia fled to Kenya, leaving the country to the hands of warlords, mafia bosses, religious fundamentalists, and terrorists of all kinds, on land and sea. Unfortunately, there is no pilot on the plane, nor in the cockpit! A fortress of evil must be conquered. The people should weep or revolt!

Where Is the Source of Optimism?

Good idea movements stimulate the need (demand) for free forms. Quite a number of individuals began to show initiative, choosing their own path. They do not let others to dictate them how to live their lives. Also, there is a lot of those who do not want to be subjects of service or accessories to the politics. This is not the first positive evolution: in the 15th and 16th century, in Europe, princes and bishops, emperors and popes, were controlling the body and soul of people; the population of each province suffered the terror of lords and their armies. The Pope and the Roman-Germanic emperors competed for Caesar's legacy. France, Castile, England, territorially closer than they are today, were fighting without mercy. Conflicts, epidemics, and violence were multiplied. Intolerance was the rule, and religious wars were horrible. Incurable diseases were raging; Black plague destroyed the population of Europe, province by province. Many writers of that time gave a pessimistic vision of the future. Everyone thought that the future will be even worse, similar to the prognosis at the beginning of this century. But at the same time, other authors (such as Petrarch, Boccaccio, Thomas Aquinas, Jean Bodin et al.), recognized the first, still visible signs of positive future. Apart from feudalism, which dominated during that period, in Lombardy, Venice, Flanders happened the awakening of: the intellect, the desire for wealth, the idea of movement, the liberation of the body, the return of Greek, Jewish and Arab thought, renewing the lessons of the Gospel, information technology (publishing houses, accounting), etc.. All that was accompanied by the discovery of continents, and the emergence of other social actors: entrepreneurs, traders, financiers, inventors, shipowners, cartographers, poets, musicians, painters, philosophers, scholars ... It was a life-changing movement of people. Renaissance today, which would have the characteristics of a long and persistent Renaissance of that time, is possible!

Much is expected of the policy. However, experience shows that individuals who make the nation are always in a position to seek their own "salvation". Better policy can, however, facilitate and improve the general situation in which, once again, individuals seek individual salvation, but their success depends on institutional environment. Institutions are the key to the progress and economic development. Good institutions should allow equal opportunities for every individual in order to improve their lives, not

just for those who are coping better in turbulent times that befell many societies, including our own.

Real changes can offer and ensure only people who are authorized to make important decisions, and those are politicians. However, major decisions in order to overcome economic turmoil are the matter of interest and preferences of voters in a democratic political system, and then the elected politicians should transform those interests and preferences into reality. Ultimately, improving the quality of political decisions depends on the critical thinking of individuals, as well as the knowledge and skills in considering and appreciating the alternatives. Hence, the knowledge is individual.

Thus, optimism should be based primarily on the development of individuals and institutions. The economic history of the world, presented in the relevant works (such as *The Wealth and Poverty of Nations*, **David Landes**; Stubovi kulture, 2004) shows that institutional order was crucial for the early stages of capitalism: relatively safe ownership, efficient judiciary system, secured contractual relations, early liberation of society from the authoritarian royal power, etc.. Due to the stimulating institutions, in these early stages of development, that environment was of paramount importance for technical progress. (This was effectively emphasized by **Ljubomir Madzar** in his book *Antiliberalism in 22 pictures*; Sluzbeni glasnik, 2012). As Landis explains, England has created the institutional climate, characterized by openness, enabling the enormous use of productive knowledge and proliferation of scientific revolution. (Development of England is analyzed in the Chapter on trade order.)

In my opinion, the level of institutional development is one of the main reasons for the contrasts in the development of Europe and Asia, as well as North and South America. These are obvious examples that clearly demonstrate the institutional dependence on the economic development. *Again is proved that the development does not require resources but institutions and rules, which, by determining the information basis and motivation, determine what to do with these resources, and how.* (Madzar).

Institutions are not easy to build. The West have been building them for decades, even for centuries in some elements. Let's repeat: evolution has its laws, history has its regularities, but major discontinuities are an exception, not the rule. Although the process of creating institutions is slow, it should be expected to gradually improve the legal system, and stimulative

The ray of creation

but fair rules of the game, in order to protect property, contracts, and personal freedoms and rights. Certainly, individuals remain responsible for their own destiny and the improvement of their well-being. The optimism is real for those who study, work, invest, save money, and engage in entrepreneurial ventures. The world, however, is not arranged by the formulas, but some people are lucky because we live in the stochastic world, where even coincidence has a role.

10. DISCOVERING INTERDEPENDENCE OF THE WORLD

We have discovered the fire of creation in us, and we have perceived the limitations of creating, and imperfections of the world. Is it enough to change our way of working and thinking? We have also realized the depth of our nature: people are creative beings. It is a big step, but not sufficient enough. We need to nurture our entrepreneurial being. That means creating and inspiring the passion for our endeavors. Creativity can be maintained through a constant discovering of the world and nature, through a process of learning and gaining knowledge. This way, our inner, creative, often dormant force is heating up. Simply put: each person has certain creative abilities; according to these abilities we perform some work, we achieve our revenue, and we survive. However, this is not about daily survival, this is about the transformation in our lives. **How to make our life more enjoyable, financially and spiritually richer?** This would be a real invention! Let us simplify it, again on the example of fire, as a metaphor of life. In the nature, the fire has helped to reveal the hidden structures: metal, mercury, copper, bronze... Thanks to the fire, the new elements have been discovered, including steel, which enabled making tools and weapons through long-time creative efforts. Fire has always been used for heating, cooking, and the other basic needs in everyday life. We should not ignore the importance of fire (lighting, heating and cooking ...). Because, when people "tamed" fire, they put it under control of a (not)obedient boundless power. They used it for forging metal and generating energy. It is our goal, such as fire being used for processing metal taken from the hidden structures of nature, to develop the ability of discovering and reviving the entrepreneurial ideas out from the spark. This is not a fundamental transformation in our life, it is a much deeper transformation - a change of attitude. It changes our mindset and the alchemy of our soul. This path of search also applies to other people, because it has a universal value. It is an

eternal quest for the essence and the beauty of discovery, which initiate the development of human thought. Hence, it is the discovery of our own tendencies to discover, the curiosity of our nature, and the need to create. Spiritual wealth is what enriches all people as the foundation of civilizations. It is the cognitive revolution that carries with it the spread of spiritual wealth. The spread of spiritual sight is constantly directing us to the new discoveries and actions. Since the cognitive revolution took place, man lives in a dual reality: the objective reality (rivers, trees, meadows...) on the one hand, and the conceptual reality (culture, religions, myths...) on the other. Behavior changes rapidly in line with emerging needs. Nothing is done unintentionally. The need push us towards the action, because the problem provokes the thought to solve the problem. We all have needs and problems which are constantly changing. Our preferences are not the same today or as they were yesterday or a year ago. In the past, people did not have possibilities for Internet surfing or going out to the café. Today, Internet technology is widely used. Before the recent economic crisis people have had fewer problems in their personal finances. The question is: how did a cognitive revolution help mankind improve?

What happened was that in the modern world, a cognitive revolution somehow led to the uniformity of knowledge and textbooks. Seems like an invisible transfer of the past, without training for applying thoughtfulness in solving unique and new situations. Twenty First century has brought some new dramas:

1. *Passive repetition.* This kind of passivity can be illustrated by the words of Nikola Tesla: *I don't care that they stole my idea... I care that they don't have any of their own.*
2. *New illiteracy.* The neglect of conversation, reading and handwriting are the sign of abandoning the traditional, and entering the new culture, where people generally interact via technical devices and where manuscript is replaced by the computer. *A large and complex, delicate and high culture is put at risk. (Bela Hamvas)*
3. *Fundamental ignorance.* Interpretation of other people's thoughts, precipitation of the knowledge already known (i.e. textbooks and practices that already existed), certainly are not much, and not sufficient. The question is: *What is my contribution apart from the knowledge already known?* Unfortunately, time characterized with a

lack of spirit brings sloppy, careless and quick action; ignorance rapidly grows, associated with boundless arrogance, unwarranted self-confidence and self-importance. The knowledge already known is also shallow, and even shallower is the knowledge that is used in order to create and improve. *Some knowledge is not required, but some is the shame not to know.* (Susnjic)

4. *Memorizing without thinking.* Education is not a process of memorizing data, it is the development of a critical thinking and imagination! This includes the development of personality, dignity and character in order to provide something new.
5. *Not understanding the new paradigm of knowledge.* The key resource in economy is no longer a labor force, nor are the natural resources. If the workforce was the decisive resource in the economy, the Chinese nation would be the richest in the world, and they are not. If natural resources were the decisive factor in the wealth of nations, Japan would be the poorest country in the world, and it is among the richest. **The knowledge is the value creator**, therefore, societies are not obliged to carry the quantities of natural resources into the brighter future, just the amount of knowledge and information in their possession. Information is today the most valuable commodity.

Are we aware of that new problems can not be solved in the old-fashioned way? Have we lost the sense of interdependence, which is a precondition for understanding the reality?

A Sence of Interdependence

I have already said that the nature is an open book from which we learn about the world. In nature coexist connections, interdependence and interdependence. The appearance and the essence of things do not coincide, so there is a need to find the essence behind that phenomena. The first who has discovered this interdependence was **Pythagoras**, a brilliant mathematician and philosopher (he lived on an island of Samos, 3 km from the Asian border, today's Turkey). This great mystic and saint had his own followers and they worshiped especially two of his discoveries - harmony

and symmetry – of sounds and numbers, of space and numbers. Everybody knows *Pythagorean theorem*: $c^2 = a^2 + b^2$, but why is it so? Can we reconstruct the thinking that led Pythagoras to discover the symmetry in space, and the square of the hypotenuse theorem? How did he spot the right angle, obtained by connecting the gravity which is vertical and the horizon that stands at right angles to it? These are two assumptions underlying our visual world. And how has he contrived the **right angle**? Angle, that has become a key element in the construction industry, and also in economic calculations together with Euclidean geometry? Pythagoras has conveyed the practical use of the right angle to the empirical science. His discovery is much deeper than it appears at first sight. He noted the concurrence between nature and numbers. He was convinced that this concurrence was general and that it was not just about arranging sounds in constellation with numbers, but also that all of its characteristic numbers express harmony. Thus, Pythagoras had found a connection between the nature and mathematics. Symbols for numbers have been discovered thanks to this connection. Bronowski explains it as follows: *A strained wire vibrates and produces the basic tone. Tones that sound harmonically with that basic tone are produced by dividing the wire into equal parts (two, three, five ...). If the stationary part of the wire, the stronghold, does not coincide with one of those correct parts, the sound is disharmonious.* Pythagoras discovered that the sounds corresponding to the ear, also correspond to the divisions on the wire in whole numbers. Pythagoras went even further and claimed that the movement of celestial bodies can be calculated if connected with musical intervals. Since all the regularities in nature are related, thus the movement of celestial bodies has its rules, such as music. Today we know that the planets that orbit around the Sun also *make music*. Mercury, with the highest rotation speed, *sings* ascending and descending scale of piccolo flute. Jupiter, the slowest, produces a deep powerful rumble. Venus changes the tone from major to minor six, and the Earth plays another beautiful minor tune. Pythagoras claimed and proved that every form of nature (the crystal, the wave, the human body...) has its own numbered structure. He translated the nature to the world of numbers. First, he proved the connection of sound and numbers (music) – arithmetics. Discovering the right angle and its rotation, he proved that the numbers also make up the structure of the seen – geometry. His explanation of the Universe by vibrating music helped the great scientist Nikola Tesla to construct his famous electric resonator, an

ingenious invention (yet practically unrealized) based on the wireless transfer of energy.

Pythagorean discovery demonstrates the existence of interdependence in nature. He laid the foundation of mathematics as a science, and **Euclid** later systematized the mathematical knowledge and raised mathematics as a science. But not only mathematics. Mathematical knowledge have contributed the development of engineering, construction and economics. Euclid showed that human knowledge was not an isolated category, and that was already an important change in the mindset. The entrepreneurial philosophy (favored in this book) is based on different ideas and holistic view of the world and society. It assumes that everything has its pre core, which is fundamental and allows an understanding of essence, simple or complex. This is the philosophy on which develops the whole science of the West, based on the Pythagorean ideas, on the ideas of a new knowledge and seeking for knowledge, both in theory and practice. In my view, different ideas and knowledge from different scientific disciplines have created the economy and enabled its growth and development. Geometry, for example, is applied in calculating the acreage of land parcels for which tenants pay rent or tax, depending on its size. The economic problem has inspired man's thought to solve it. People were interested in the spiritual and material development, staying aware of the connection between them. The best proof of this is a fact that Euclid's *Elementary Geometry* and the *Bible* have been the most frequently translated book! Obviously, the importance of these books in the conceptual world and the material sphere of life, has created the market. Euclid's Geometry was Einstein's first reading when he was twelve years old. It was his *holy book*, and probably contributed to his decision to do the science. In this book Einstein discovered the realm of a pure thought. Without expensive laboratories or equipment, he was able to analyze universal truth, limited only by the power of a clear mind. Ideas that are the basis of human knowledge have different origin, but they all have their embryo, which can be seen as a basic element of the scientific structure. In economics, that embryo is the exchange transaction, because economy starts with the transaction, which is economic atom, even today! Imagine the world without exchange, where all subjects of economy produce only what they need! Economy in practice starts with the exchange. Billions of economic transactions are performed at this moment. But there is always the interdependence between these

transactions, production and consumption. The ancient Greeks thought that something can not appear out of nothing. Therefore, with the discoveries of the interdependence between the participants in the economy, begun the discoveries in this science. The essential role of transactions in the economy is often neglected, because it is taken for granted. Freedom of market transactions is the basis all freedoms. We have good reasons to buy and sell, to understand and demand, but all of that can be developed only on the transaction basis. To deny this freedom, generally, would be a failure of the society. Freedom implies the existence of the rules of behavior. Economy was build on those grounds.

It is logical to seek the interdependence of economic phenomena in terms of markets, where economic life is taking place. The normal functioning of the market meets the interests of many people. However, there are groups whose established interests are threatened by such operating. If such groups are influential and politically strong, they may try to limit an adequate market space, which is the best filled in the free market. This can be a particularly serious problem when monopolistic production units are multiplied - despite the inefficiency and inability of different types - thanks to the isolation of competition, whether it's foreign or domestic. High price or low quality of the products, which follow thus artificially supported production, may impose greater suffering for the entire population, in addition to organized and politically influential groups of "industrialists", who carefully protect their profits. Here emerge politics, and political influences, in search of economic benefits, and that is *a very real phenomenon in the world today*, according to Nobel Prize-winning economist **Amartya Sen**. Contrary to the limitation of market competition, establishing the rules, benefits and prospects of the market requires different types of institutions. In understanding the economic phenomena must be take into account the existing types of institutions and their functioning. The market mechanism, which causes many discussions pro and con, is a fundamental arrangement by which people can interact and undertake mutually beneficial activities. In its pure functioning forms, which enable the free transactions, it is difficult to find a reasonable critic who is against the market mechanism. The problems that arise mainly originate from other sources - inadequate preparedness for the use of market transactions, unlimited processing of information or irregular use of activities, which allows capitalization of asymmetric advantage for the powerful elite.

Clearly, *the overall achievements of the market is deeply contingent on political and social arrangements* (Sen). The market mechanism has achieved great success thanks to the conditions in which their benefits can be reasonably shared. Hence, everybody should be looking for new ideas that emerge from the phenomenon of interdependence, which sometimes at first sight seem completely opposite. That is how the discovery begins in every science.

Pythagoras and Euclid have linked all symmetries and harmonies of space with two dimensions. The paradigm of their thinking is two-dimensional. For example, an explanation of economy was a maximization of manufacture, until the conclusion that production depends on the market. This gives a new paradigm for economy. Does the introduction of exchange in the economy complicates the situation? Does the market economy include the third dimension - the exchange? We buy from the others, we sell to the others. Hence, our business takes place in a multidimensional space: production, exchange, and consumption. The same is in nature, with three dominating dimensions: length, width, and height.

Ricardian economics begun to realize the multidimensionality in the 17th century, claiming to understand the main cause-effect changes in economy. There are systematic cause-effect changes or systematic causality. There is also a system in economic phenomena. However, economy seems chaotic to many people, because they do not see a clear cause-effect connection in the economy, or the law of cause and effect that controls all the actions. Economists have been long arguing that this is a misconception. According to them, systematic changes of cause-effect results can be clearly demonstrated, understood, and identified. That was a great contribution to the classical school of economics. This view was wrong, but the concept was dominant. Discovering a causal relationship of economic activities was fruitful during the economic history. Ricardian, classical economists, believed that the basis of that causation of economic phenomena was a physical reality. Man lives in the world of a powerful system of causes and effects, and that makes the economic reality. The classical economy has developed starting from a simple physical law of diminishing returns and the fundamental understanding that physical resources, labor and capital determined the cause-effect relation in economy.

It was a very respectable and powerful set of ideas that regulated economy of **Adam Smith, Ricardo and Mill** until 1870. Then has begun so-

called Marginal Utility Theory Revolution, widely seen as a revolution in the theory of value. Classical (Ricardian) Economics believes in the pricing theory of value. It is, in other words, the belief that the value is determined by scarce resources. However, that is just a fragment of an overall picture, which they had set up in the economy. All the cause-effect changes should be attributed to the physical reality. Marginal Utility Theory Revolution has indicated the wishes of consumers, the complexity of these wishes, and the law of diminishing utility. This has fundamentally changed the paradigm of economic mindset – identifying the basic facts such as the marginal utility. Consumers play a major role in determining the value. In 1871, **Carl Menger** has published his *Principles of Economics*, with far more fundamental views. That fundamental truth will be explained in this book. First, on top of a clean sheet of paper write the word: RESOURCES, and at the bottom: CONSUMER SATISFACTION, and in the middle: MANUFACTURERS.

The manufacturers turn the resources into the consumer satisfaction. This is the basic structure of economy. You start with a piece of land, you dig out ore and make metal, you manufacture automobiles and other products that satisfy consumers. All the time you move from the resources towards the consumers, and in that movement you make many steps, you achieve many stages. According to the classical school of economics, causality is the direction from resources towards consumption. Resources determine the production and market prices. This is a general perspective of the classical school, and within it is generated the working theory of value. In 1871 Carl Menger had a view which was completely opposite, revolutionary! Causality of the changes is dictated by the opposite side, from the bottom, or from the customer satisfaction towards the resources. This is an absolute revolution! The theory of labor value is replaced by the marginal utility theory. The theory of marginal value is part of a broader perspective, which Carl Menger has illuminated with great clarity, confirming the main attitude of the Austrian School of Economics and its main contribution.

The Culture of Curiosity

Looking for solutions to a problem gives rises to inventions and theories, not only in the economy. This means that only an intense life can find solutions! Significant factor is the character of culture, because without the culture of curiosity there is no discovery, no new products and no

services. Why Americans have not discovered the Old World (Europe) but it was the other way around? Surely, this was not caused by a force majeure. In the world exists the law of causality. Therefore, an explanation for the previous question must be found in reality and historical events timeline. Obviously, the old world had a greater tendency for research, and thus more curiosity. Ancient Greeks and other nations around the Mediterranean Sea had a strong culture of curiosity, adding systematics to it, and linking an Empire (daily) with reason (thinking). The spirit of curiosity that created change, and change that created the need, have led to the discoveries much faster in the Old than in the New World. From that need (curiosity) of the European people to expand geographical aspects, astrology has developed. The expansion of communication and openness, astrology, and economic power of the Old World, enabled the discovery of America. The technical discoveries have been the powerful driving force of economic development. The discoveries were especially numerous among nations who made progress in the rational knowledge - understanding of the phenomenon around them, which was not the case among nations with passive attitude toward the world. Thus, the Old world acted proactively, and the New World acted quite opposite – very passive. In the New World the thought was dogmatic, there was no culture of curiosity and research, only the mindset controlled by the management. Many peoples with such culture have disappeared (Mayans, Aztecs, Indians).

Between 1500 and 1950, the Far East and the Islamic world have not come even close to the level of Newtonian physics and Darwinian biology. Does this mean that Europeans have a unique gene for science? Clearly not. The key reason was the difference in mindset. Europeans tended to firmly connect science and economy. The same thing that botanist did in search of plant species, or the naval officer looking for the colonies, because they both shared the similar mindset. Both the scientist and the conqueror started with the recognition of ignorance - they both had the same attitude: I do not know what is out there. But they both wanted to go out and to discover. And they both hoped that new acquired knowledge will make them the masters of the world. The conquest of knowledge was interwoven with the winning territory. In the 18th and 19th century, almost all the major military expeditions, sent from Europe to the Far East, had scientists on ships, not to fight but to come up with scientific discoveries. When Napoleon invaded Egypt in 1798, he had 165 scientists with him! Among other things, they

have designed a new scientific discipline, Egyptology, giving an important contribution to the study of religion, linguistics and botany. In 1831 the Royal Navy sent the ship HMS Beagle to draw the map along the coasts of South America, Falkland Islands and Galapagos. Navy needed that kind of knowledge to be better prepared in case of war. The captain of the ship, amateur scientist, decided to join the expedition of geologists to study the geological formations that could be found during the voyage. After several professional geologists rejected his call, the captain offered a job 22-year-old Cambridge graduate, **Charles Darwin**. Darwin accepted and the rest is history. On this trip, Darwin has collected empirical facts and formulated insights that will eventually become the theory of evolution.

The discovery of America was an amazing event, which encouraged Europeans to seek new skills with breakneck speed. These European expeditions – explore and conquer – are too familiar to be critically discussed. However, they were the basis for the creation of a new economy, new trade routes, new wealth and resources.

I emphasize: things, events and processes should not be taken for granted! How many things, events and actions seem completely natural - but we never doubt them. Such an attitude does not lead to the rise and development. This probably applies for every individual. We must not judge on appearances and the first image of people, things and events. The question "Why is it so?" drives our spirit, idea and action (dynamism, change, movement). This ability raised many civilizations. On the other hand, civilizations that hampered the dynamics of human thought, by using control and regulation, have faced problems in the development process. They have simply lost their lever of economic and overall development. This has influenced the control of thought and research. Think about losing the primacy of the Mediterranean, then the Roman Empire: could that be understood as a natural event or it has some deeper causes?

The question **Why?** is the key dynamics of our soul, and our understanding of the world around us. Even on simple matters were created major theories and discoveries. At the age of 16, Einstein has performed a thought experiment known as "Albert Einstein's mirror". Staring into the mirror, he tried to fathom what would happen to his mirror-image if he started to move at the speed of light. His conclusion was that the speed of light was independent of the speed of the observer (the speed of its source), which, among other things, was initiated by this thinking, and was to

become one of the two postulates of special relativity. Einstein was constantly thinking on these simple images. Turning to the mirror-image, at one point he imagined himself running parallelly with the ray of light, and asked the key question: how would then look the ray of light? Such as Newton imagined throwing a stone until it starts, like the Moon, revolving around the Earth. He posited a theory of gravity. Einstein's attempt to imagine that ray of light will lead to far-reaching and surprising discoveries. Njegos has created his great work, *The Ray of Microcosm*, on a comparison of the soul with the light! Is the secret of a man linked to the secret of light? A microcosm of an individual occurs on the creation of the concept, the image, the vision that exist in his soul - it is the philosophy of every individual. This philosophy is an origination of the real created world. It is the key or fate of individuals and civilizations. It allows the perception, understanding and discovering the reality, both the society and nature. People behave according to their philosophy, which is the basis of their opinions, in accordance with images in their heads. These images form a paradigm of thought, and individual conception of the world, and the spiritual world. The paradigm of thinking determines our mindset, behavior and actions. Discovering a new theory in relation to the old logic changes our images (performances) of reality, and our conceptual world. This change of image and performance in our heads under the influence of scientific discoveries is called scientific revolution. Naturally, an individual changes his conceptual world through the new knowledge – it is a personal revolution or evolution, depending on the size of the idea and the change. The most complex change is the transition – a change of theory and practice. This change of paradigm is gradual, and within the microcosm of the world is conveyed from one generation to another.

There are two paradigms of mindset: the regulated world as a collection of events in the absolute temporal and spatial context, and the world of relativity, which depends on the relationship between events and phenomena. We know that the creator of the second worldview is Einstein. He puts a man in the foreground, so the understanding of the world depends on his attitude towards it. Great discoveries have occurred in Europe, on the shoulders of the giants that we have selected in this book as leading creators. They are the bearers of human groundbreaking thought in time. They have, as individuals, created the history. What drives the society forward is

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precisely this holy spirit of creativity that has been conveyed from one genius to another throughout history.

Why Europe?

Northern Europe has been deserted and barbaric for a long time, almost until the 15th century. British Isles and Western Europe as a whole were completely uninteresting. Culture and trade were flourishing in the Mediterranean. Even the Roman Empire, the only important pre-modern European empire, was focused on Africa, Middle East, and Balkans. Only at the end of the 15th century, Europe has indeed become the focal point of major military, political, economic, and cultural development. Between 1500 and 1750 Western Europe has experienced a remarkable change, and has become the master of both American continents and oceans.

Why Europe? Why at that period? The questions are difficult, especially considering that Europe was nothing in particular compared to the great powers of Asia. Namely, in 1775 Asia had 80% of the world economy. The combined economies of India and China represented two-thirds of the world production! The early modern era was the prosperity period in the Ottoman Empire in the Mediterranean, the Safavid empire in Persia, the Mughal Empire in India, and China's dynasties Ming and Qing. In comparison with them, Europe was an economic dwarf.

Yet, the Europeans managed to conquer America and achieve superiority at sea! Basically, it was the tendency of Europeans to discover and explore the new world. However, Asian peoples did not have those aspirations. Asia was not interested in the new world.

A world center of power moves to Europe between 1750 and 1850, when Europeans beat Asian forces in a series of wars, and conquer a large part of Asia. By 1900, Europeans firmly control of the world economy and most of its territory. Under the influence of Europe a new global culture have been developing, until today.

How did this happen? We said that the incredible curiosity of Europeans helped to explain. Furthermore, It has encouraged the innovation. Technological inventions have inspired Europeans to seek new paths, new countries, new products, and new profits. European scientists are now creating new technological inventions: weapons, medicine, and machinery for their imperial masters. Military-industrial complex thrives in Europe.

The question is: why was it so hard for the Chinese and the Ottomans to invent the steam engine, railway tracks, or other devices? There

are two complex answers: modern science and capitalism. The change in European mindset is essential. Europeans are accustomed to think and act on scientific and capitalist way before they gained any technological advantage. At the beginning of technological golden age, Europeans could have used it far better than anyone else. For this reason, it is not a coincidence that science and capitalism are the most important achievement that European imperialism had conveyed to the post-European world of the 21st century. Europe and Europeans have lost the absolute power, for exactly the same reasons that had brought them on top of world's power.

New ideas, new mind, the look to the future, people's obsession with philosophy and desire to explain the world around them, all this was an environment that northern Europe had been developing in the 17th and 18th century. Increasing freedom of the people was the basis of the new mindset. The ship was the center of attention and study, because it was the most appropriate vehicle for the dissemination of new thinking. Logically, there was an interest to use the boat as much as possible, therefore it was the subject of attention. They sought the answers to the questions: How to enable the ship for long voyages? How to direct and determine the position of the ship on the ocean? How to determine the duration of sailing between ports? These were all important issues in the era without airplanes, cars or anything modern world now knows. These issues were especially important when the center of economic development moved from the Mediterranean to northern Europe, or when the Mediterranean lost its primacy and the center of economic development moved to the Atlantic Coast. This transition was a major breakthrough and huge challenge to human intellect. Because: 1) the logic of tightness (Mediterranean) was overdated, and 2) the practice has imposed the theoretical issues. The challenge of the ship improvement imposed a direct need for exchanging goods, now at the global market (17th century). Solving the practical problems of maritime transport resulted in the discovery of the flute ships and caravels, as well as the major advances of the first globalization. This logic applies to each individual. Whether to stay in the hometown, in an environment of certainty and familiarity, or to give it a try in a global space with plenty of suspense and the unknown, but also plenty of options. This commitment to exploring the unknown world, and accepting the challenges of uncertainty, pulls us forward, developing our imagination, energy and skills. Again, it is important to understand that the history of this behavior was caused (encouraged) by the need, both material

Discovering interdependence of the world

and spiritual. This means more goods, and more goods mean more trade, and trade requires more production, that is, more material and spiritual capital. The development of both influenced the social mindset. In certain circumstances, the ship was a dominant need, predominantly influencing the mindset, as it was a center of interest at the time. Practical problems of overseas ships, which became floating factories, needed answers to many questions. For example, how to obtain orientation in the open sea (how to determine the position, the speed, the distance to the nearest port). A series of practical and complex issues of that time. Searching for answers to these questions led to the two dominant technological achievements - the telescope and the clock - and the two dominant theoretical discoveries - Newton's law of gravity and Einstein's theory of relativity. Practical problems of navigating the ship in time space encouraged wider thinking about time and space. The movement of the ship was associated with the movement of celestial bodies. Can the movement of the ship be explained by the movement of the stars, and vice versa? This connection has become the focus for discovering the telescope. The ship as a moving object has initiated the reflection on the relativity of time. The clock was a connection with the theory of gravity. The theory of gravity could be practically used only by improving the clock. Earth revolves around its axis in 24 hours, each of the 360 degrees of geographic coordinates takes 4 minutes (24 hours times 60 minutes equals 1440 minutes, 1440 minutes by 360 equals 4 minutes). Captain compares noon on his ship (the sun is at its highest point) with the noon on the clock (set by Greenwich). Every 4 minutes of the differences indicate that the ship is 1 degree away from Greenwich (simplified explanation).

The universe comes to the focus of scientific research and becomes a major factor in upcoming scientific revolution.

11. THE NEW PARADIGM OF THE WORLD

Since the dawn of civilization we have been trying to practice some kind of science, imposing our mental model to the natural world. Initially, those were religious forms. For example, sunrise and sunset, or a sudden appearance of lightning, fit in the scheme of explanation that God drives a car the across the sky or that He is irritated by human behavior and takes care of things with lot of noise. But the ancient Greeks, starting from Thales, who lived between 624 and 546 BC, established another model of thinking about the world.

Later, the Greek philosopher Aristotle stated that Thales was the first philosopher who requested the material causes. Aristotle named Thales and his followers physikai or physicists, to distinguish them from theologou or theologians. However, what the Greek philosophers practiced was not the doctrine in the modern sense, since they did not care much about the experiment and observation, but were looking for patterns in the physical world, believing that they did not depend on gods.

A good example are two ancient Greeks philosopher' theories on the constituents of all substances. Before the Greeks, a thing represented just a thing. Water was made of water. Fire was made of fire, etc. Pretty undefined! But the Greeks introduced two new possible patterns. The first was by Empedocles (philosopher, 5th century BC) – everything is made of four main elements: earth, air, fire, and water. Previous physicists believed that everything was made of one substance - the prime matter. Empedocles developed his idea about the elements using practical experience. When a piece of wood is burned, then the fire releases hot air (sometimes even water), and the ashes remains as a soil.

Different types of observations have created another theory. Namely, two Empedocles's contemporaries: Leucippus and his pupil Democritus, have been working on dividing the substance into smaller and smaller pieces, until the last, indivisible part. That element, which is no longer divisible, is

atom, and everything is made out of it. According to these two theorists, atoms deduct (combine) in space, until their combinations create various forms/things, found in nature.

Unusual and interesting is that the first theory was wrong, but also very similar to the real scientific theory. Empedocles and Democritus presented their hypotheses, trying to make them defensible, in the style of ancient Greece, and to prove it with arguments (theoretically), without experiments that could confirm or refute them. However, the theory of the atom does not tell us much about the matter. In its original version, all atoms are composed of the same prime matter, but have different forms. Thus, depending on the shape they may be atoms of cheese or atoms of water or atoms of human flesh. This explanation did not enable an understanding of the matter concept, and problem is its excessive simplicity.

Comparison of the theory of four elements with the previous one, although it is not equivalent, leads to understandable images and pattern which clearly suggests four components. Their combination can produce any substance. This is a good example of implementing the pattern for simplification and understanding of reality.

With Renaissance, the mindset created by the Greeks gets a new dimension. The classical approach was still strong in universities: less science and more belief. But the approaches, led by Galilei, have revised the wisdom of ancient authorities and set up new hypotheses based on observation and experimentation. Galileo was not only theorizing, but he also performed experiments. Admittedly, he has probably never thrown his famous balls from the Leaning Tower of Pisa. That story was apparently connected with the assistant in his old age - or, perhaps he has been conducting numerous observations. Soon after his era, a leader of brand new thought comes at the scientific stage, a brilliant thinker - Isaac Newton.

Forces of the Sun and the Moon

Newtonian physics have done much more than what laws of motion were suppose to, which can predict what will happen, or can indicate how white light is created from the colors of rainbow. This has enabled the whole new level of patterns due to better understanding of the universe as a controlled system. This especially became significant with the development of mathematics, which explains everything - from the planet orbit, to the

movement of the tiniest speck of dust. Newton has rejected the need for God's power in explaining the world. Instead of the world pushed into orbit by an angel and managed by God, Newton has given us a kind of universe that works like a clock, where everything stems mechanically, predictably, and where nothing happens by accident.

Ironically, Newton's mathematics has distanced us from the need to understand the supernatural intervention in the functioning of the universe. However, at least one of his theories was accused to be occultistic. In the flourish of his mathematical genius, Newton wrote a book *Mathematical Principles of Natural Philosophy* (*Philosophiae Naturalis Principia Mathematica*) – huge work, containing his laws of motion and gravity. This book is not very legible in terms of the modern reader (it has a complicated geometry for what could be solved with simple algebra), but its contribution is in providing a new theory for predicting the ways in which objects move in space. One thing that Newton has failed to explain was gravity, although he has explained how gravity affects the distance. His opponents accused him for using the term "attraction", which indicates the force, for example the one that keeps the Earth in orbit around the Sun.

Today, this seems perfectly normal - attractive force of gravity is a part of our everyday apprehension. But at that time, the word "attraction" did not have scientific meaning. This term referred more to the attraction between men and women, or the human reaction, rather than the force of nature. His critics thought that Newton's Earth and Sun (and, similarly, Moon and Earth) "attract" each other. Newton's interpretation of gravity was criticized by his bitter rivals - the Dutch scientist Christiaan Huygens, and the German mathematician Gottfried Wilhelm Leibniz.

Huygens, who had a habit of criticizing Newton's ideas, thought that the idea of attracting celestial bodies was absurd. Leibniz, a great mathematician, thought that the Newtonian concept was retrograde. (Newton and Leibniz argued over who first invented calculus). Leibniz rejected the suggestion that the two celestial bodies attract, saying that it was a return to occult qualities and, even worse, to inexplicable ones. They did not really think that this theory was occult because it implied the use of black magic, only in terms of excessive mystical connection. Leibniz knew that for the occurrence of an event something must be transferred from point A to point B. In another words: to hear someone talking in a room, compressed wave must be transferred through the air, from the vocal chords of the

speaker to the eardrums of the listener. Newton stated that stars (somehow) influence each other at a distance, and that nothing corresponds between them!?

Neither Newton himself was not clear about it. Despite the claim that he did not "hypothesize" about how gravity works, he actually had an idea that there is some kind of invisible particle flow that was constantly taking place between solid bodies, allowing the existence of gravity. Before Einstein, the best theory of gravity causes was that gravity is a mechanical relationship between the bodies. According to Newton, there is no current specific gravity of particles flowing in space. Since heavy celestial body reduces the number of particles when the second body is nearby, the result is that this body is affected with fewer particles, thus, the pressure keeps it moving towards the heavier body. That is attraction. This theory contains details that may adapt – for example: Why gravity depends on a mass but not on a size - however, a dose of occult still remains.

In the end, Newton's theory was applicable. It correctly predicted the behavior of moving objects and bodies in an orbit. It gave a mechanical image of the world, very applicable in a vast reality. Obviously, there was a reason for attraction between the bodies, and that was understood to some extent. For many pragmatic people this was acceptable - it does not matter why it works, because it works and can be applied.

Although Newton was aware that his explanation of movement and gravity could explain the functioning of the universe without the help of other forces, he was a very religious man. He believed that the role of God was to keep the mechanics of reality on the right track. That was His role in the stability of the universe! The problem was that the simple application of Newton's mathematics could cause the collapse of the universe. Newton firstly imagined what the universe would be like if it was definite. If the status of stars and planets was taken from the edge of this finite universe, then there should have been a stronger attraction within the center of the universe, because it contains more bodies. Therefore, the universe could experience the collapse from the forces within!

Newton has come to this presumably inevitable collapse of everything, starting from the assumption that the universe is still indefinite (controversial concept at the time). Hence, regardless of its position in the space, a massive body attracts other bodies from all sides. However, Newton still had a problem: the universe could be stable only if everything located in

exactly corresponding positions - as being set by God. If any body even slightly shifted from its position, the collapse of the universe would have been inevitable.

According to Newton, the only way to maintain the stability of the universe is constant presence of God, which ensures that everything is in the right position, keeping from the collapse. For Laplace, the great mathematician and physicist and Newton's opponent, God is unnecessary component of the universe, because there is no space for redirecting the celestial bodies from their fixed orbits. Mechanical perfection of the universe allows the stability of all movements. According to an anecdote, when Napoleon asked Laplace why he did not mention God in his philosophy, Laplace replied: Sir, I have no need of that hypothesis. According to Laplace there is no room in the universe for coincidence and random deviations from the body movement. What will happen today or in a hundred years had been determined during the formation of the universe, when everything had an initial state, setting all the movement routes of celestial bodies. There was no change, nor accidental impact, nor distortion of the magnificent project. The only obvious avoidance of this system was the concept that Laplace had taken from Rene Descartes, a French philosopher of the 17th century. The very concept dates back to ancient Greece. This idea, known as dualism, assumes that a man is composed of two independent components: material and thought (mind), being supernatural or supermaterial. (Supernatural in the sense that he is out of the nature, out of the matter).

If there is such separation of mind and body, then it is possible that the physical aspects of the universe correspond with Newton's necessity, or the thinking part - human mind. Such exists separately from the physical world and probably it is able to direct the physical world, or to influence the change of the initial order in universe, which functions as a clock mechanism. To avoid this, and to take control over physical world, human body and mind need to be connected. This is the weakest part of this theory, because it requires the connection between nature, supernature, physical, and intangible. Descartes has doubted that pineal gland in the brain provides the connection of these two parts of human being. Today, we are pretty sure that it is not true.

The starting point in attempting to make the mechanistic movement calculation of the universe is an analysis of the Earth and the Sun

relationship. The next step is, naturally, the inclusion of clearly visible celestial body, the Moon. That is the analysis of three bodies: the Earth revolving around the Sun, and the Moon orbiting the Earth. This is a simplification of the real Solar system, but it is more complex than the behavior of the two bodies. Newton was the first to recognize that it was not as trivial as it was believed at the time. Clearly, the Earth and the Sun influence the movement of the Moon. A simple calculation presumes that larger celestial bodies are influenced by the Moon, however, they are, thanks to the gravitational attraction. The existence of gravity of the Moon indicates its influence on the movement of the Earth and the Sun.

If there are two bodies, then it is quite easy to calculate their effect on each other; with the third body, interferences that effect the orbits usually produce chaotic randomness, which interferes the accurate prediction of their motion. Newton worked on this in his Principles, but he did not take into account all the elements, only the calculations of the Sun's influence on the Moon, and not vice versa.

In practice, it was discovered very early that in solving problems of the three bodies, there are results that are impossible to predict. Indeed, there are so many different conditions that can arise from the same starting point. Instead of precise calculations in solving the problem of three bodies (and the Solar system as a whole), mathematicians had to use approximations. With a lot of computation, those approximations were very good. The Apollo mission was sent to the Moon using the basics of Newtonian physics with enough good approximations to operate the flight, taking into account the influence of the Sun, the Earth, the Moon and the other planets, especially the massive Jupiter. It was sufficient to dispatch a robot to the Moon, to take samples from its surface, and to return to the Earth. Laplace's perfect prediction and Newton's mathematics were quite implemental in the short-term approximations.

Things get more complicated when relativity is taken into account. This idea dates back to Galileo, who claimed: For describing motion, any „frame of reference“ is as good as any other. Thus, if you are sitting in a chair and reading this, you are in relation with the seat, you are not in motion; or, the chair would be in motion in relation with the Earth, if you were sitting on an airplane, for example. Or, the Earth rotates in relation to the Sun and the other planets in the universe, and so on. Galileo gave us the

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concept of motion, which takes into account the reference relationship: whereby the motion is observed.

In 1905, Einstein went one step further in developing the concept of special relativity. Thanks to the work of Scottish physicist James Clerk Maxwell, it was found that the light is a reciprocity of electricity and magnetism. The movement of electricity produces magnetism; the movement of magnetism produces electricity.

Einstein imagined motion (flying) on a ray of sunshine. In such correlation, according to relativity relations, a ray of sunshine would not be in motion. This means that the air does not exist because it does not move at a desired pace that creates electricity, which creates magnetism, nor it would create electricity, etc. In fact, whenever someone moves in such way, all the light around him disappears - which sounds bizarre.

This paradox has inspired Einstein to make new steps. What if, he thought, the light is unlike anything else in the universe? What if the light is always moving at the same speed, and you are moving towards the light or away from it? The light would ignore the relativity and keep on moving. That way, whether you are in motion or not, whatever is your frame of reference, the light would be moving independently.

This motion has the desired effect: the light exists in our relativistic universe. Apparently, there is a price - very high. If you put the behavior of light in the basic equations of motion and energy, derived from Newton's work, the moving object is transformed. This happens whenever things are moving. Initially, this occurrence increases the mass of moving objects. This may take place at any speed, but is hard to notice until it reaches the speed of light. However, the mass also increases, striving to infinity as the speed approaches the speed of light. This is presented by the most famous equation in the history of mankind:

$$e = m \cdot c^2$$

Increasing mass is one of the reasons why it is impossible to fly faster, up to reaching the speed of light – more energy is needed for such a flight, since the energy is proportional to the mass. It would require an endless amount of energy to pass through the barrier of the light speed (even though theoretically it is possible).

Let us go back to the three-body issue. The bodies are mobile – that is the main point. Due to their motion, every body will "see" that other

The new paradigm of the world

bodies increase the mass and the speed. This seems rather insignificant for the speed of the Sun, the Moon and the Earth - but the situation obviously becomes complicated if the bodies approach the speed of light. Taking relativity into account, the only feasible approach is an approximation, because it is possible to obtain the precise approximative values. Seemingly, the approximation could be at the pretty good level of accuracy, almost to the final step, however the final result is not achievable arrival to the exact value.

12. SKY IS THE LIMIT

Previous discussion shows that science, as element of a civilization, is the series of gradual progression, based on a previous (a priori) knowledge. In this progression, a big step is the evolution of our ideas about the sky - from a revolutionary theory of Nicolaus Copernicus - that the Earth revolves around the Sun, to an equally revolutionary theory of Albert Einstein - that space and time are curved under the influence of mass and energy. These are fascinating stories of creation, which can not go unnoticed in this book.

Before **Nicolaus Copernicus** came to the scene, people believed that the Sun is just another planet. By placing the Sun at the center of the planetary system began the Copernican revolution. After moving the Earth from the center of the universe, Copernicus was forced to work on the theory of gravity. Before him, it was believed that gravity had only one center (the Earth), but Copernicus gave the theory that every celestial body had its own gravity, and that all heavy objects gravitate towards their own centers. This has eventually led to developing the theory of universal gravitation. However, the significance of this idea was not visible then.

His ideas were relatively little known for almost hundred years, but the 17th century gave us people like G. Galilei, **Johannes Kepler** and Isaac Newton. Guided by the Copernican heliocentric theory of the Universe, they have completely disproved Aristotle's ideas. Many authors have written about the humble Polish priest, who has improved the human perception of the Universe, however, the most eloquent was a German author and scientist **Johann Wolfgang von Goethe**, writing about Copernicus's contribution to world science: *Yet among all discoveries and convictions none may have produced a greater effect on the human spirit than the doctrine of Copernicus. Hardly had the world been acknowledged as spherical and closed in itself when it should abandon the enormous prerogative to be the centre of the universe. Perhaps never a greater challenge has been imposed*

on mankind; for what of innocence, poetry and piety, the testimony of the senses, the conviction of a poetic-religious belief; no wonder that they did not want to let go of all this, that they opposed such a doctrine in all manners, which entitled and summoned him, who accepted it, to a hitherto unknown, yea unimagined freedom of thought and greatness of views.

Even as a child, I watched the stars on a night sky and it was a magic picture. I often wondered did that starry sky have any connection with our life, what was behind these stars, why we could not see them during the day, why the moon seemed so close? In my imagination, questions swarmed like those glittering dots on a blue night sky. Later I found out that the science that studied the universe was called astrology. Is astrology formed out of curiosity or practicality? The most convincing answer was the practical problem that needed to be solved. Astrology, or the study of the stars, was observed in all civilizations. Mayans were seeking a link between the occurrence and movement of stars and time in order to design the calendar. Some civilizations have studied the sky for safer journey, using stars for orientation on the open sea, and later on the ocean. How come Christopher Columbus never got lost in his sea adventures? - was another of my childhood questions, while I listened to the lessons of the discovery of America. Then, I did not connected that with the stars as signposts. The movement of the stars across the night sky may have guided the passenger at sea, who had no other landmarks. Have you ever thought about the curiosity of ancient Greeks and other nations on the Mediterranean Sea, which inspired them to do the research, as a form of human behavior, thus influencing the cultural patterns and temperament. It was connecting the Empire (daily) with reason (mindset). This model of behavior led them to the New World. The same model applies to everyone: the development of each individual is enabled through exploring the world, and searching for the answer to the question: Why? Very often the answer is not easy. One of the difficult questions is why the renaissance of the society (releasing the former paradigm emitted by the church) happened in the 14th and 15th century? It gave revolutionary inventions, including what the most essential - the Copernican system of the universe. In this book, I have tried to present the following ideas: nothing is given by itself, everything has roots, we have to get into the way of thinking, into paradigm (understanding of the world) of the analyzed epoch. We pointed out the interdependence of the world in which we live. For example, Copernicus studied law and medicine in Italy!

He worked as an adviser in the Cabinet for Economic Development (the monetary issues), and the Pope asked for his help during the calendar reform. Isn't it a little strange that a lawyer and a doctor is also a financial advisor and famous astrologer? Unfortunately, it is strange from the point of today's isolation of sciences. We should ask ourselves how Copernicus, knowing law, medicine and astrology, had more opportunities to reach the abstraction that can only be obtained by uniting separate knowledge (the laws of society, the laws of nature, human organism, the universe). How much have it helped him to significantly contribute changing the world paradigm that Church had been emitting for fifteen centuries?

Nicolaus Copernicus

Copernicus was born on February 19, 1473 in Thorn, Poland, in a family of merchants and clerks, devoted to education. Copernicus' uncle, Lucas Watzenrode, Prince-Bishop of Ermland, made sure that his nephew got the best academic education in Poland. In 1492 Copernicus enrolled at the university in Krakow, attending four-year general studies. He then went to Italy to study law and medicine, which was common practice for the Polish elite at that time. While studying at the University of Bologna (where he later became professor of astronomy), Copernicus lived in the home of Domenico Maria de Novara, a famous mathematician who will eventually become his tutor. Novara was a great critic of Ptolemy, and skeptical of his astronomy. In November 1500, Copernicus was in Rome during lunar eclipse. Although the next few years he spent in Italy, studying medicine, his fascination with astronomy never faded. Day after day he was diligently learning in the Vatican Library. Gradually he mastered the entire science of Ptolemaic system, which he had already studied in Krakow with his teacher Brudzewski. However, in the Greek original file, he found more than he had previously known. Ptolemy's *Syntax* attracted his particular attention. In the seventh chapter of the first book, Ptolemy explains the basic assumption of his system that the Earth is not moving, he also mentions philosophers who thought that the starry sky was motionless, and that the Earth moves and turns. Copernicus found that this assumption, which was contrary to Ptolemy's, should not be dismissed. Therefore, he analyzed the opinion of Ptolemy's opponents: Hicetas of Syracuse, Aristarchus, Archimedes, Ecphantus the Pythagorean, and Heraclides Ponticus.

After obtaining the title of Doctor of Canon Law, Copernicus was also studying medicine in Halzburg, where his uncle lived at the time. Members of the royal family and church leaders required his skills in treating illnesses, but Copernicus spent most of his time helping the poor. In 1503 he returned to Poland and moved into his uncle's episcopal palace. There he dealt with administrative matters of diathesis, and worked for his uncle as an advisor. After his uncle's death, Copernicus permanently moved to Frauenburg where he spent the rest of his life working as a priest. He was erudite, who knew mathematics, medicine and theology. In 1513 Copernicus built his observation tower, starting the mission that would make him famous. He used astronomical instruments such as quadrants, astrolabes parallaxes in order to observe the Sun, the Moon and the stars. The following year he wrote a brief *Commentariolus on the movements of celestial bodies based on their schedule*, but he did not publish the manuscript. He distributed it to his best friends. *Commentariolus* was actually the first attempt to spread the astronomical theory that the Earth moved, and that the Sun was stationed. Copernicus became dissatisfied with Aristotelian-Ptolemaic astronomic system, which dominated the West for centuries. He thought that the center of the Earth was not the center of the Universe, but only the center of the Moon's orbit. Over time, he began to believe that the observed changes in planet's motion were the result of Earth's rotation around its axis and along its orbit. We revolve around the Sun like any other planet, he wrote in his *Commentariolus*. Copernicus was afraid of being exposed to despise of the people and the Church. Therefore, he secretly worked for years on correcting and extending his *Commentariolus*. The result was *The Revolutions of the Heavenly Bodies*. The work was completed in 1530, but he waited thirteen years to publish it.

The main reason for this delay was the fear that his revolutionary ideas would undermine the authority of the Catholic Church. It took a lot of courage to come out with the view completely opposite to the Church's. In 1616, by the decision of the Church, Copernicus's work was declared improper, and was revoked in 1822.

Ideas of Galileo Galilei (1564-1642)

In 1633, ninety years after death of Nicolaus Copernicus, an Italian astronomer and mathematician Galileo Galilei was accused of heresy and taken to Rome to trial before the Inquisition. The reason for prosecution was the publication of Galileo's *Dialogue Concerning The Two Chief World Systems - Ptolemaic and Copernican*. In this book, despite the proclamation of 1616, Galileo strongly argued against the spread of Copernican doctrine, claiming that the heliocentric system was not only a hypothesis, but also truth. There was no doubt in the outcome of the trial. Galileo admitted that he might have gone too far in arguments in favor of the Copernican system, though the Roman Catholic Church had already warned him. He was sentenced to imprisonment for life.

Galileo was also forced to write a confession in which he publicly renounced his views. On his knees with his hands on the Bible, he said the following words in Latin:

I, Galileo Galilei, son of the late Vincenzo Galilei of Florence, aged 70 years, being brought personally to judgment, and, kneeling before you, Most Eminent and Most Reverend Lords Cardinals, General Inquisitors of the universal Christian republic against heretical depravity, having before my eyes the Holy Gosels, which I touch with my own hands, swear, that I have always believed, and now believe, and with the help of God will in future believe, every article which the Holy Catholic and Apostolic Church of Rome holds, teaches, and preaches.

But because I had been enjoined by this Holy Office alltogether to abandon the false opinion which maintains that the sun is the centre and immoveable, and that the earth is not the centre and moveable, Willing, therefore, to remove from the minds of Your Eminences, and of every Catholic Christian, this vehement suspicion rightfully entertained towards me, with a sincere heart and unfeigned faith, I abjure, curse and detest the said errors and sect contrary to the said Holy Church; and I swear, that I will never more in future say or assert anything verbally, or in writing, which may give rise to a similar suspicion of me: but if I shall know any heretic, or any one suspected of heresy, that I will denounce him to this holy Office, or to the Inquisitor and Ordinary of the place in which I may be.

I swear, moreover, and promise, that I will fulfil, and observe fully, all the penances which have been, or shall be laid on me by this Holy Office.

But if it shall happen that I violate any of my said promises, oaths, and protestations, (which God averts!) I subject myself to all the pains and punishments, which have been decreed and promulgated by the sacred canons, and other general and particular constitutions, against delinquents of this description.

So may god help me, and his Holy Gospel, which I touch with my own hands.

I, the above-named Galileo Galilei, have abjured, sworn, promised, and found myself, as above, and in witness thereof with my own hand have subscribed this present writing of my objurataion, which I have recited word for word.

At Rome in the Convent of Minerva, 22nd June, 1633. I, Galileo Galilei, have abjured as above with my own hand.

Legend says that Galilei, after he got up, he muttered under his breath: *Eppur si muove!* (It does move though!), which expresses Galileo's character and commitment to scientific truth.

Born in Pisa on 18 February 1564, Galileo Galilei was the son of Vincenzo Galilei, a musician and mathematician. His family moved to Florence when Galileo was young and his education begun in a monastery. Although already in young age Galileo showed his talent for mathematics and mechanics, his father was adamant - his son should do "useful things". Hence, in 1581, Galileo enrolled at the University of Pisa, in order to study medicine and philosophy of Aristotle. However, his rebellion begun in Pisa. He was not much interested in medicine, therefore he started passionately to study mathematics. It is believed that Galileo discovered isochronism of the pendulum while observing oscillations of a hanging lamp in the cathedral of Pisa. The period of swing of a pendulum is independent of its amplitude - which Galileo would apply half a century later in creating the astronomical clock.

Galileo was convinced his father to allow him to leave the university before graduation, so he returned to Florence to study and teach mathematics. In 1586, he began to question Aristotle's teachings and philosophy. He preferred works of the great mathematician Archimedes, who was known for the discovery and development of methods for calculating area and volume. Archimedes was also famous for the invention of many machines, which would eventually be used as a tool of war - such as giant catapults for backfilling enemy armies with rocks, and large cranes

for sinking the ships. Galileo was mostly inspired by the mathematical genius of Archimedes, but he was also driven with the spirit of inventiveness, thus he designed hydrostatic equilibrium for determining the density of the measured object in the water.

In 1589, Galileo became a professor of mathematics at the University of Pisa, where he was asked to teach Ptolemaic astronomy – according to which the Sun and other planets revolve around the Earth. In Pisa, at the age of 20, Galileo perfected his knowledge of astronomy and despised the teachings of Aristotle and Ptolemy. Notes from his lectures show that Galileo accepted the Archimedean teachings - the density of the existing body, not the weight as Aristotle argued, is in the proportion to the speed of falling. Galileo demonstrated the theory by throwing objects of different weight, but the same density, from top of the Pisa tower. He also wrote the *Movement*, a book that contradicted Aristotelian theories of movement, which established Galileo as a scientific leader of the Reformation.

In 1597 Galileo invented the proportional compass, which proved to be useful for mechanical engineers and soldiers. He started the family, continuing various experiments. In the early 17th century, Galileo conducted experiments with a pendulum, linked to the natural acceleration phenomenon. He also began working on a mathematical model describing motion of falling body, measuring the time of rolling balls down the sloping slabs on different distances. In 1603, a supernova that appeared in the sky above Padua, again encouraged the scientific issues related to the Aristotelian model of immutable heavens. Galileo eagerly threw himself into the debate and held several provocative lectures, but he hesitated to publish his theory. In October 1608, a Dutchman **Hans Lippershey** patented the telescope, able to zoom in on distant objects. When Galileo heard of the invention, he immediately began improving it. Soon, he designed a telescope three times stronger than Lippershey's, but within a year it was ten times stronger. In January 1610, when he installed it, the heavens literally opened to humanity! The moon was no longer a perfectly smooth disk, proving to have mountains and craters. With his telescope, Galileo found that the Milky Way was actually a huge collection of individual stars. Most importantly, he noticed four moons around Jupiter, which was the discovery of incredible implications for many geocentrics, who believed that all heavenly bodies revolve solely around the Earth! Same year, Galileo

Skay is the limit

published his findings in *The Starry Messenger*, raising himself to the top of astronomy of an era.

Isaac Newton's Contribution to the Ray of Creation

Let's go back to one of the greatest minds in the evolution of mankind - Isaac Newton (1642 - 1727), according to some, even the greatest. English poet Alexander Pope, touched by Newton's achievements, has written the famous epitaph:

*Nature and nature's laws lay hid in night:
God said "Let Newton be!" and all was light.*

Isaac Newton is considered the father of infinitesimal calculus, mechanics, theory of planetary motion, and theories of the world and color. However, he secured his place in the history by formulating the gravitational force, defining the laws of motion and attraction in his monumental work *The Mathematical Principles of Natural Philosophy*, known as *The Principia*, where Newton collected scientific contributions of Copernicus, Galileo, Kepler and the others into a dynamic new symphony. The *Principia*, the first book of theoretical physics, is considered to be most comprehensive work in the history of science and the scientific basis of the modern world.

Newton has written three books of *Principia* in only eighteen months, despite his severe mental breakdowns. Even as a boy, Newton often asked himself questions that have deeply confused the entire humanity, and then he found answers to many of them. It was the beginning of a life full of discoveries, despite some painful initial steps. Isaac Newton was born in Woolsthorpe, England, an industrial town in the county of Lincolnshire, on a Christmas Day 1642 - the same year that Galileo died. His mother did not expect that the child will live long, because he was born prematurely; later, Newton noted that he was so small as an infant, that he could fit in the bowl. He was only three months old when he lost his father. Newton had a difficult childhood, but from the early days he showed curiosity, which will define all of his life achievements. He was very interested in the mechanical models and architectural drawings; he spent countless hours making clocks, dragons, sundials, and miniature mills (run by mice), and drawing complex sketches of animals and ships. In elementary school he was one of the worst students, and teachers often described him as impractical and idle. Despite his curiosity and passion for learning, Newton was unable to devote himself to school. He even dropped out of elementary school since due to poor

learning performance. Instead, he was given to run family company and estate, but he also gave poor results. He went back to school and begun preparing for university. During his studies at Trinity University he focused on mechanics and mathematics. When the university was closed in 1665 because of the black plague, Newton retreated to Lincolnshire, to the family estate of Newtons. For eighteen months, while the plague raged, he devoted himself to mechanics and mathematics, optics and gravitation. That period, the *anus mirabilis*, as Newton has named it, was one of the most productive and the most prolific periods of his life.

In all the doctrines at that time, the ancient Greeks have been exceeded. In mathematics there were numeric signs, symbolic codes for mathematical operations, and the use of letters for general numbers, a developed mathematical language of extraordinary abilities. Analytic Geometry, founded by Descartes, has created a link between arithmetics and geometry, enabling solving the geometric problems by computation. That has infinitely expanded the field of geometry. While the Greeks knew only a limited number of geometric *curves*, now every arbitrary equation between the coordinates b and a represented a single curve, by which their number has become unlimited. It started with examining these curves, determining their tangents, asymptotes, inflection and extreme points, calculating their length, and even their area between the setpoints. For solving these problems, different individual methods have been established. However, various curves required different methods, not having the character of a general method that could be applied to every curve. In the field of mechanics the Greeks have been exceeded, particularly due to Galileo's contribution.

In 1665 or 1666, young Newton started solving above-mentioned geometric problems, considering geometry an integral part of mechanics. He realized that solving the problem of tangent was actually calculation of a quotient, which we today call the differential coefficient with a significance of a speed at which a non-permanent value changes. Starting from these assumption, Newton found a general method for determining the quotient - he called *fluxion* - and thus he solved all tasks related to the tangent problem! With this work he laid the foundations of infinitesimal calculus. A note where Newton wrote a basic idea of that fluxion is dated November 16th 1665, when he was 23 years old. In his insights, even then, he went a lot further than all his contemporaries who dealt with the same problem.

After solving fluxions, Newton devoted himself to other issues, particularly the nature of light and the movement of celestial bodies.

According to anecdote, at about that time, an apple fell at Newton's head. It awakened him from his sleep under a tree, and inspired him to define the law of gravity. No matter how many suspected that story, Newton claimed that an apple "encouraged" his thinking about gravity. It is believed that he then performed his experiments with the pendulum. *I was in the prime of my age for inventions*, Newton later recalled, *and I was thinking about mathematics and philosophy more than ever before.*

When he returned to Cambridge, Newton studied the philosophy of Aristotle and Descartes, as well as the teachings of Thomas Hobbes and Robert Boyle. He was also consumed with the mechanics of Copernicus and Galileo's astronomy, and Kepler's optics. At that time, Newton began with experiments related to prism and refraction and dispersion of light, most probably in his room at Trinity or in his house in Vulstropu.

Thanks to the recommendation of Isaac Brown, a professor at Cambridge, Newton became a professor at the same university, studying optics and mathematics. In 1666, he began creating a theory of movement, but he was not able to adequately explain the mechanics of circular motion. Relying on Kepler's laws of motion, Newton has set the so-called inverse square law, where the gravitational force between two bodies is inversely proportional to the square of the distance between their centers. Newton has begun to comprehend that gravity was universal – the same force causes the apple to fall to the ground, and the Moon to orbit the Earth. He continued to work despite all the obstacles and opponents.

While Galileo indicated that the bodies were "attracted" towards the center of the ground, Newton proved that this same force, the gravity, affected the orbits of the planets. He was also acquainted with Galileo's study on the motion of cannon shots, claiming that the Moon's orbit around the Earth respected the same principles. Newton showed that gravity explained and predicted the movement of the Moon, as well as the tide shifts on Earth. The Principia, Volume I, contains three Newton's laws of motion:

1. Every object in a state of uniform motion tends to remain in that state of motion unless an external force is applied to it.
2. The change of motion is proportional to the driving force, and is created at the straight line in relation to this force;

3. For every action there is always opposite and equal reaction; or, the mutual actions of two bodies are always equal and directed in opposite directions.

With a set of laws Newton has united the Earth with all that was seen in the sky. In the first two "rules of inference", Volume III, Newton has written: *No more causes of natural things should be admitted than are both are true and sufficient to explain their phenomena. Therefore, the causes assigned to natural effects of the same kind must be, so far as possible, the same.*

As mentioned earlier, Newton has written three books of Principia in just 18 months – enduring heavy mental health problems. He had many opponents in life, and among the greatest of his enemies was Robert Hook, also known as the scientist who has studied similar areas. It is known that the slightest criticism of Newton's work, even if wrapped in praise, often drove him into a dark depression that lasted for months, even years. This characteristic has appeared early in his life and has led some people to wonder which questions would have Newton answered if he has not been dealing with his personal animosities.

Although his life was marked by petty debates and great arrogance, Isaac Newton had modestly spoke of his achievements: *I do not know what I may appear to the world, but to myself I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me.*

Thus Newton's laws, the most magnificent ideas that mortal man could ever fathom, proved to be the general laws of nature, which conquered the entire universe. Newton's genius has spread far, far away.

Newton's first law is not exactly a commonplace or everyday occurrence, because if you initiate something here on Earth (if you hit the ball, for example), after a while it will, due to friction, stop moving. Newton's insight was in conceiving the way objects behaved when they were not under the influence of friction – such as celestial bodies or atoms that vibrated inside the container filled with gas.

Newton's second law easier corresponds to an experience and common thinking – massive objects are harder to move. And Newton's third

The ray of creation

law has clear logic: from it follows that, as the Earth's gravity affects the Moon, the same or opposite directed force of the Moon affects the Earth.

Three Newton's Laws are applicable to the cosmic phenomena (e.g. the motion of the planets), also in everyday life (e.g. the motion on a slope or objects in collision). Since these general laws are applicable to the movement of atoms and molecules, soon emerged structural mechanics, which further developed for two hundred years after Newton's death, as well as the modern kinetic theory, which will be discussed in this book.

13. GLOBAL SCENE

The final result of man's ascent is a global world that became a reality. The main change that has led humanity to the global world happened in the early 19th century. It has brought the progress of communication technology, which has fundamentally changed the dimensions of the world. Until then, the transport speed has not changed for millennia, and then a change has allowed journey around our planet in just a few weeks, not several years, as it was before. The messages were transmitted much faster. Numerous technical innovations, no matter where from, have brought profit to only one country: the United Kingdom. We have learned that London became the main shopping center of that era.

In 1803, **Robert Fulton**, an American engineer and inventor, has put into use the first steam ship. The first motor-boat was launched in 1809, sailing from Philadelphia to New York. The first steam locomotive was used in 1814 in the UK. The first train with passengers traveled in 1825, and since then the circulation of people, goods and, more importantly, the ideas has accelerated. In 1833, the optical telegraph was replaced with electrical, and Germany established the first operational connection using the new telegraph. Telegraph lines were installed along the railways in the UK, Germany, Netherlands, Austria-Hungary, Russia, Italy, France. **Samuel Morse**, an American painter, has sent on 24th of May 1844 the first message between Washington and Baltimore, using a single-wire telegraph and his Morse code. In 1850, a submarine telegraph cable has linked England and France, and eight years later, England and North America.

Electric telegraph has improved conditions for transferring information, enabling nearly instant messaging across the globe. After this invention, information were being exchanged almost in a real time.

London, as a center of trade and economic development at that time, used all these advanced techniques in banking and finance to create profits.

This was the impetus to expand markets beyond national borders, and to unite the world. Great Britain has become the first force in the world thanks to the irresistible superiority of technique and science. It has produced machinery for processing cotton, water pumps, barometers and more. In 1870, Great Britain produced 40% of industrial products the world market, whilst 40% of UK production was exported.

Jules Verne, a famous writer and futurist, in his novel *Around the World in Eighty Days* (1872), clearly expressed the aspirations of connectivity around the world. The hero of the novel is a rich Englishman, in honor of the mighty England, - Phileas Fogg (his name was inspired by the Greek geographer from the 5th century who had described a trip around the Mediterranean). Phileas accepts a wager for £20,000 (equal to about £1.6 million today) from his fellow club members, which he will receive if he makes it around the world in 80 days. The first part of the journey is by train across Europe, through the Suez Canal. The second part of the journey is by boat across the Red Sea to Bombay. Then by ship to Shanghai, Hong Kong and San Francisco. The next part of the journey is by train from San Francisco to New York, then back by boat to Queenstown and Liverpool, then by train to London, where Phileas arrives on time and wins the bet. Today we travel around the world by plane for a few hours or days with stops at all the places visited by the hero of Verne's novel.

Economic competition was flaring up, and the United States of America became the biggest rival to the United Kingdom. London seemed to be weary of domination; a country with numerous advantages due to the speed of transport by rail. In 1865, the *Locomotive Act* has reduced permissible speeds on public roads to 2 miles per hour within cities and 4 miles per hour in rural areas. However, there were more serious issues: resources used by the British have become more expensive - in America, after the Civil War, black people freed from slavery, causing the increase of cotton prices; London, as the financial center of the world until 1890, was threatened by the emergence of new, American banks; industrial production of the USA in 1875 exceeded the industrial production of Great Britain ...

In the competition for world domination were also Germany and France, but more conditions for taking over the world power had the United States of America. In the early 20th century the United States consolidated their power and, like England before, were now in a position to create a world order in their favor. However, the United States, unlike their predecessor, wanted to dominate the power of their weapons, industry, diplomacy, establishing the institutional architecture, which was the proof of

their strength and contributed to peace. Descendants of those who, like Jefferson, saw America as a *realm of freedom* at the end of 18th century, tended to the planetary generalization of democracy, because democracy guaranteed a management system that perfectly suited their own interests.

Awareness of the Global Scene

The fact is that in the 20th century, the world has become very interdependent, more than ever before. The share of cross-border economic exchange exceeds a quarter of world production; the share of underdeveloped countries in world trade has increased from one-quarter to one-third. The world financial markets are increasingly integrated.

Production chains are also integrated at the global level. The iPhone, for example, is not "made in China", but is truly "made in the world." For American jeans, cotton is harvested in Uzbekistan, spun and woven in India, and other parts (buttons, straps, labels) are made in China, South Korea and Thailand. Finally, all these parts are put together in Bangladesh. It is similar with many other products.

Interdependence of the people also increases each day, reducing the cost of information transfer, and learning about events around the globe. Internet has particularly facilitated the interdependence since its introduction in the late 80s of the 20th century – today, there are 5 billion mobile phones, 2 billion Internet users, more than 155 million bloggers, 500 million active Facebook users, 100 million on MySpace, 100 million on LinkedIn, and over 70 million on Twitter. Thanks to Skype, Viber, WhatsApp, and the other applications we can communicate for free with anyone on the planet. Everyone knows about what is happening in the world. Dictatorship of any kind can no longer hide its activities. This technological change is also a tool for the promoting individualism, an outstanding accelerator of transparency, democracy and feelings of unity in the world.

Because of all this, humanity still has no serious quantitative measures for everything that is happening in the world, whether it's advanced or destructive. Therefore, it is extremely difficult to establish a comparable balance, at least approximate. Let's try to analyze 2011.

Population of the world was 7 billion, of which 4% lived in large cities with over one million inhabitants. Average life expectancy was 68.9 years (66.9 for men, 71 for women). Younger than 15 years was 27.4% of the world's population (1.8 billion people). More than 200 million people

lived outside their country of birth; 3 million students were studying abroad; one billion tourists traveled in 2010, and 500,000 people were on airplanes at any time ...

About 155,000 patents are registered annually throughout the world. Almost 1% percent of gross domestic product is allocated for the research purposes. Although half of the world population is literate, 75 million adults are completely illiterate.

About half of the world population live in democracies; 87 countries are free (45% of all the countries or 43% of the entire world population); 60% are partially free countries (31% of the countries or 22% of the world population); 47 countries are not free (24% of the countries or 35% of the world population); 2.5 billion people still live in dictatorships ...

About 800 million pieces of small arms circulate the world, of which two thirds are in the hands of civilians. There are 22,000 nuclear weapons, of which 4,500 are operational nuclear warheads and 2,000 are for the purpose of warning; \$1.500 billion is allocated for the army expenses ...

The gross national product, not including criminal (gray) economy, is about \$70 trillion dollars (i.e. \$10,000 per capita). Financial assets are \$150 trillion; 70% is used to finance loans, which is twice the value of global annual production.

Daily consumption of food is 900 calories per person. That requires daily production of 2 billion tons of wheat, 250 million tons of meat, and 110 million tons of fish. Around 800 million cars circulate the planet. Annual world consumption of energy is equivalent to 11.6 billion tons of gasoline, of which 40% in the industry. More than 95% are the fossil fuels, and the world's known reserves contain about 1.200 billion barrels (in 43 years of constant consumption). There are 442 active nuclear power plants, which produce 17% of the world electricity. The natural gas reserves are 180 trillion m³ (in 63 years of constant consumption). Every year, the atmosphere emits 30 billion tons of carbon dioxide. Iron, copper, and aluminum are the most used metals. Critical materials are: antimony, thorium, beryllium, cobalt, fluorine, gallium, germanium, indium, graphite, magnesium, niobium, platinum, tantalum, tungsten ...

The forests cover 4 billion hectares; 13 million are disappearing every year. One person uses more than 4,000 km³ fresh water (1,300 m³) per year. More than 70% of this water is used in agriculture, 20% in industry, and 10% in households.

Two billion and three hundred million people (41% of the world population) does not have enough water, living with less than 1,700 m³ of

water per year. Two and a half billion people have no sanitation systems nor devices for water. One billion people live below the extreme poverty threshold, suffering from hunger; poverty is increasing, and the poor become even poorer. Two-thirds of illiterate people are women. Violence against women is increasing.

There are 15,000 private jets around the world, and over thousand of billionaires.

According to some sources, the criminal (gray) economy makes between 5% and 20% of the world economy. There are assumptions that \$1.800 billion circulate in the financial crimes, and as much in medicaments, prostitution, narcotics, etc.

Also, gray economy includes tax evasion, and illegal economy, which operates through "tax havens". About \$10,000 billion is directed to tax havens, 35% of international trade and 35% of the financial flow in transit. One-third of direct investments is executed through these "havens".

There are numerous attempts to systematize all these data. The United Nations have calculated some indicators that measure the level of social development, in order to calculate also the level of health and education. In 2010, the level of social development was 0.68, which means that it has increased compared to 0.48 in 1970.

World Management Index consists of five indicators: **peace and security, rule of law, human rights, sustainable development, and human development**. The results of these indicators for 2008 are: 8.40 for peace and security; 5.30 for the rule of law; 5.71 for human rights; 5.9 for sustainable development, and 6.3 for human development (the maximum score was 10).

It is very difficult to combine such data, and their reliability is questionable. In addition, no one is obligated nor responsible for conducting these global statistics, except the regular reports by National Statistics. Since statistics are imperfect mirrors of entities, their flaws are reflected as deficiencies of the international image of humanity.

Today, the values of the world are mostly preserved in the West. Their outcome has been found, presumably, in the long history of Judeo-Greek period. The values of mankind could be summed up in individualism and everything that comes from that value (rationality, formal democracy, human rights, market economy, private property), which is now almost universally present or pursued.

However, everyone in India, China, Nigeria, Egypt, Tunisia, Saudi Arabia ... wishes to have access to material benefits, which the West has more than fifty years (houses, cars, washing machines, televisions, computers, etc.), and also to have freedom to move, opinion, to criticize the management and conduct the changes. We can talk about the triumph of individualism. Discovery of the Internet and social networks has accelerated this phenomenon, because it enables creating the community of choice and global connectivity.

Faith in the Future

It is not easy to comprehend the true position of an individual in a modern history. It seems that he/she has more faith in the future than ever (despite the pessimism mentioned earlier). This faith encourages the growth, as well as material and spiritual development. Let's show this on an example:

Warren Buffett, a wily financier, has founded a bank in El Dorado, California.

Bill Ravis, hastily trained contractor from El Dorado, finishes his first major work, receives his wage of €1 million in cash, and he deposits the sum in the Warren Buffett's bank. The bank now has a capital of one million dollars.

Meanwhile, Jane McDonat, experienced but poor baker from El Dorado, thinks about opening the bakery in her neighbourhood. But she does not have enough money to buy adequate business space and fill it with ovens, sinks, dishes. She goes to the bank presents her business plan to Warren Buffett, and convinces him that her investment is profitable. The banker gives her a loan of one million euros, crediting her bank account by that amount.

Jane McDonat now hires Bill Ravis, the contractor, to build and equip her bakery. His price is one million euros.

When she pays him with the signed check, which burdens her account, Bill Ravis deposits that money to his account in the Warren Buffett's bank.

So, how much money Bill Ravis has in his bank account? Exactly 2 million!

How much money is there actually in the bank? Yes, 1 million.

This is not the end. As usual, after two months of work, Bill Ravis informs Jane McDonart that, due to unforeseen problems, the costs of the

construction have amounted to €2 million. Jane McDonat is not thrilled, but she can not give up in the middle of construction works. Therefore, she visits the bank again, assuring Warren Buffett to grant her an additional loan, and he deposits another million to her account. She transfers that money back to the constructor's account.

How much money Bill Ravis now has on his account? Yes, 3 million. But how much money is actually in the bank? Still only 1 million. In fact, it is the same one million, which had been in the bank all the time.

The current US banking law allows the bank to repeat this escapade up to seven times. The contractor will eventually have 10 million on his account, even if the bank has only one million. The banks are allowed to borrow \$10 for every dollar that they actually possess, which means that 90% of the money on our bank accounts is not covered by the actual banknotes and securities. If all the owners of the bank accounts suddenly claimed their money, the bank would have immediately collapsed (except in case that government rescue them). The same applies to Atlas Bank, The First Bank or any other bank in the world.

Is this a scam, and thus, is the modern economy a scam? The answer is in the essence of trust – the only stock for most of the money in the world.

In the example of bakery, the discrepancy between the money invested by the contractor, and the actual amount of money is provided by the bakery, which is now built and needs to create new revenue, new money. The money in the bank is transformed into an asset on the basis of trust that will be profitable in the future. Thus, the owner of the bakery expects that in one year will be selling thousands of muffins, biscuits, loaves of bread, and pastry, with a decent daily profit. Repayment of the loan will be done with interest. Warren Buffett will be able to pay in cash. The whole endeavor is based on faith in an imaginary future – both, the entrepreneur and the banker, have confidence in the future business, and the contractor has confidence in the future solvency of the bank.

An entrepreneur can not bake without a bakery. Without baking products she can not earn money. Without money, she can not hire a contractor. Without contractor there would be no bakery. If this chain does not exist, the economy would be frozen. It has been for thousands of years until the advent of a new system based on faith in the future. A special type of money is invented, called "loan". The loan allows us to build the present at the expense of the future. It is based on the assumption that our future

resources will certainly be far more abundant than our current resources. When people began to believe that the future is better than the present, this kind of money began to function. For a long time there has not been economic growth in the world, which means that the cake has been the same size for a long time. The loan is the difference between today's and tomorrow's cake. There were probably some brilliant business ideas, but there was no money for their realization. No new businesses - no economy growth.

Faith in the future came with the scientific revolution and the idea of progress. For more than 500 years, the idea of progress has aroused a greater confidence in the future. This idea has created loan; loan has contributed to real economic growth; growth has increased confidence in the future. This gave rise to the system of capitalism, whose theoretical foundations were laid by Scottish economist **Adam Smith** in *The Wealth of Nations* (1776), probably the most important economic manifesto of all time. He argued that selfish human need to increase personal gain was the basis for collective wealth. According to Smith, becoming richer will do good to everyone. Egotism is altruism! Smith's logic was this: if I am poor, you will be poor, too, because I will not be able to buy your products and services. If I am rich, you will also be rich, because you will be able to sell me something. Smith argued that the profits should be reinvested in production. This would bring even greater profit, which will be reinvested back into production. And so ad infinitum. Investing in production is the most important thing in capitalism.

This is why capitalism is called capitalism! Capitalism distinguishes *capital* from *wealth*. Capital consists of money, goods and resources invested in the production. Wealth, on the other hand, is hidden under the mattress or is wasted on non-productive activities. This is a narrower definition of capitalism. I support a broader view which, apart from material capital, also includes spiritual capital.

Capitalism began as a theory about the economy – offering the analysis on money-making possibilities and promoting the idea that the reinvestment of profits into production leads to rapid economic growth. However, capitalism has become a broader concept than simple economic doctrine, because it has covered all spheres of life. The basic principle of capitalism is that economic growth is the supreme good, because without growth there is no justice, freedom, not even happiness. Capitalism allows the development of science by investing in research projects that increase production and profits and deliver economic growth. The most important is

the link between capitalism and science, because it has enabled: the discovery of America, the internal combustion engine, genetic engineering, etc. All this is supported by the banks and everything is based on a faith in endless economic growth.

Capitalism has not only played a key role in the development of modern science, but also in the development of European imperialism. History of the trading system has already been discussed, now we need to point out that European traders and bankers became the ruling elite in the era of imperialism, especially English imperialism. A decade after decade, Western Europe has witnessed the development of sophisticated financial systems that had been able to draw large amounts of credit funds in the short term and put them at the disposal of private entrepreneurs and governments. Numerous investments had been financed by loans. First, Spain has dictated the capital investments, and then Holland, and England. Holland has particularly contributed to innovations in financing investments by discovery of the stock exchange, and joint stock companies with limited liability. Ventures were financed by several investors, and the risk was shared between them. The development of legal system has provided confidence in the stock market and credit institutions – Holland has established the right of private property.

In the name of the capital, in 15th century started the colonization of Africa, Australia, USA, China, as well as numerous conflicts and wars. A complex economic system has been created, with a belief in the free market.

Faith in the future is based on these values: individualism and democracy give the main tune to today's societies.

Society of Spiritual Capital and Ideas

New demands are shaping life and existence, but the change of ideological sphere does not seem to keep up with reality. This is especially evident in the areas of social sciences, where the shift of mindset paradigm is slow. Most of the world's economists are lulled in ideas of the old economy. The old economy is shaped by the parameters of the industrial era, which had been known then. The main problem of research in economic science was the relationship between supply and demand, and supply and employment. Many economists believe in the causality of economic activities, according to a model that stems from the physical reality. The supply/production grow with changes in interest rates or money supply.

Economists have set the equation, convinced that it reflects the relationship between economic phenomena, particularly employment as the factor of production.

The legacy of the old economy is so rich that many economists today, including Nobel laureates, are still working on topics that their teachers had started in the 17th century. In essence, they are trying to interpret the current economic reality through the prism of the old doctrine, with strenuous modifications and development of mathematical models that can only partly explain the global economy. It is important to point out that the world has changed drastically, even from the time of Maynard Keynes and Friedrich Hayek, the famous and original thinkers of the 20th century. Particular change is that the economy is no longer confined within a single country, nor the world is still a blend of separate and independent nation-state. Instead, the world is made of interdependent national and regional units.

In a world without borders, within the economic sphere, many parameters and many economic entities are in the game, including many challenges for economic science in further research. Suppose that benefits of information technology have significantly reduced the importance of stock. Companies like Toyota, Dell and Inditex have showed that the model *just in time* is successful. Therefore, the old, grand theories relating to this area are no longer adequate. Another complication comes from the fact that the digital-economy is rapidly growing. The cross-border exchange of goods, services and even financial instruments, is taking place in places which are not usual for the economic science. In the interdependent global economy, the money moves without supervision and according to the attractiveness of an area in the world.

Let's recall the ideas of the old economy – they are the product of historical circumstances in which they have incurred. In case of **Adam Smith**, the pin factory was a masterpiece of technical innovation. He was interested in the production, mostly neglecting the service sector, which in the 18th century was indeed negligible compared to the present age. He considered the markets within local boundaries, the foreign trade; he argued that competition may be a result of decreased profits. Adam Smith was the first economist who thought that the market was the most powerful mechanism of resource allocation in the economy.

David Ricardo (1772-1823) lived at a time when industrialization began in England. Most of his thoughts were about issues such as salaries of agricultural workers and land lease. Manufacturing has been in the

background, and he was rather interested in international trade, and known for his concept of comparative advantage. Ricardo was a proponent of unfettered international trade, and a great critic of the so-called Corn laws, that prevented the import of cheaper grain from North America and Eastern Europe. According to Ricardo, the economy was once and forever the national thing. He was among the first who have applied the rigid causal methodology in economics.

Economics of John Maynard Keynes has stemmed from a serious economic crisis 30s of the 20th century. The economic crises are always accompanied with economic disturbances, such as high unemployment and inflation. High unemployment is always accompanied with low market demand, which Keynes solved with injection of demand provided by the government. According to Keynes, the market did not function, as Smit assumed, with the *invisible hand*, because balance between supply and demand could not be achieved in a long term.

Keynes was not only a theorist in the clouds, but also a practitioner, very well acquainted with the world that surrounded him. Like Richard, he earned large sums of money on the financial markets. He found answers in the context of the world of nation-states, whose governments could only solve problems that arised within a closed economic system. The age of imperialism, in which he lived, was replaced with nationalism. In economic terms, the governments of the early 20th century were responsible, apart from the old function of protecting the territory, for many other areas of life, such as education, health and housing. This responsibility has resulted in protectionism, which Keynes did not explicitly advocated. The economic model was a closed economy, based on a reliable input and output variables, mutually interrelated (employment, demand, supply, interest rates, and money supply). The model based on a linear approach and belief that government can not control the economic activities of adapting to one or two factors. The thinking was similar to physics, according to the Newtonian model of conservation of mass (or energy) within a closed system.

Can the models from the late 19th and early 20th century, based on the economy of the nation-state and linear input and output, serve in the global economy? The economic reality in which Smith, Ricardo and Keynes lived, is essentially different from the one that was at the beginning of the 21st century. The emergence of new technologies has caused fundamental

changes in the flow of information and the business world. The dissimilarity is best illustrated by the differences between the technologies used then and now.

The technology for the transmission of information in the 19th century was an optical telegraph. With the advent of optical telegraph - a system of visual messages through the traffic light alphabet (first half of the 19th century) - began an era of the active development of business information exchange. The first optical telegraph was set by the French brothers Claude and Ignace Chappe (1794), between Paris and Lille (225 km). Those "complicated" devices are impossible to imagine nowadays, because they are, to us, today, really complicated! Imagine devices for delivering messages installed on towers. The line of transmission consisted of a chain of towers in a visible distance from one another. The message was transmitted successively - from tower to tower - but it took considerable time to deliver the messages. However, it was a great invention at the time! Compared to today's standards, telegraphic system is extremely slow, but then it was faster than the earlier ways of sending messages. The longest line of the optical telegraph was between St. Petersburg and Warsaw (1200 km), in the period from 1839 to 1854. The signal transmission was traveling 15 minutes from St. Petersburg to Warsaw (and vice versa)! The rapid development of telegraph began using electrical impulses from 1819 to 1937, when Samuel Morse invented a method of transmitting text information as a series of dots and dashes - the so-called Morse code, as a system for quick transmission over long distances. This invention served as an incentive to establish the entire network of telegraph lines, which covered all parts of the globe in the following decades. In the forties of the 19th century, several telegraph lines have crossed the Atlantic Ocean and telecommunication networks have linked all the continents on Earth. Thus, the global telecommunications networks have been established in the second half of the 19th century, enabling the transfer of a significant amount of information, primarily administrative and business. Innovations in the field of information exchange have caused synergistic effect, manifesting in substantial changes to the theory and practice modes for individuals and companies.

Today's business communication is based on the *Internet*. It is a revolutionary innovation and a major step forward in the rise of mankind. It changes the boundaries between organizations, and between people and organizations. It also enables more efficient business organization. Online business allows remote work and collaboration with employees and partners

elsewhere. Internet is a proof that cooperation and freedom of information may contribute more to innovation, much more than market competition and property rights. The creation and development of the Internet is one of the most unusual stories about entrepreneurial ventures. It proves a man's ability to overcome institutional goals and bureaucratic obstacles, and to create a new world, significantly different from the previous one. Production of technology throughout history shapes its content and application in ways that go beyond the limits of the original intent. Clearly, Internet is no exception to this rule. Through its development, Internet has been brought to its present form, a *global network of computer networks*, easy to use through World Wide Web, an application on top of Internet hierarchy.

Today, a document can be sent "to the other side of the world" for as much time as you need to click on the send button on your screen. Wider use of *voice over IP* (VoIP) system allows free communication between friends and family. Technology and deregulation has freed the money from the national economy. Cash flows to the places of the highest profit, wherever they may be. For the money (and its retailers) there is no sentimentality, nor worry about the old notions such as patriotism. The *Keynesian bathtub* teorem is no longer sufficient to explain the supply of money in the macroeconomic model, because in a global economy we can see a steady stream of money, but not its aspiration. Formula for solving deflation through inflation has also shown to be problematic. It is a therapy based on the function developed by **Alferd Marshall** in the late 19th century. The coefficient, known to economists as *Marchall's scissors analysis*, depends on the relationship between the money supply and gross national income. Many economists believe that its value is constant. Since the value is fixed, it is considered that the state with strong deflationary pressures needs to raise the money supply. This should lead to the increase of prices and inflation growth. **Paul Krugman** has prescribed this therapy for Japan's deflation, and that was a recipe that many other economists use. But, no matter how much money was injected in the Japanese economy, the expected inflation has never happened. In other words, the real economy did not absorb money. The industry has not used the capital to invest in equipment or supplies, and the population has been careful and has not rushed shopping in fear of inflation. All these minor and major changes provoke the change on the geopolitical scene, transforming the traditional

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notion of the nation-state in the outdated outcome. Vast technological changes have globalized the life and work of the people.

Connecting the Planet with a Perspective

Globalization is a process which is not controllable. It is a very complex and hardly conceivable resultant, primarily of technological trends, to which all contribute (within their limits), but noone "controls" them, and then unpredictable shifts in major geopolitical and geoeconomic decisions, which are also not fully controlled, nor predicted. (Madzar) In addition, it is impossible to anticipate where globalization actually lead. Globalization can be controlled almost like the climate conditions and their changes. However, the situation is more complex in the case of globalization than in the case of weather changes. At least, the weather changes are forecasted in a short term, quite accurately and confidently predictable; but, it is not the same with the trends of macroeconomic changes. Specifically, meteorology can provide a short term forecast with a high degree of reliability and measure; macroeconomics can not exist in a short term, not even in exceptional situations. Because, the world is very complex, extremely jagged, and infinitely complicated.

The wave of globalization has swept people, companies, and countries. Our goal is to help the process of understanding complex issues of globalization, especially to empower creative individuals. They are the focus of this text and they deserve support while searching for their place under the sun, in this very harsh world.

The development in a global environment is only possible when based on changes. However, changes are not just for the sake of changes. Changes are necessary in order to create something new. Innovations and entrepreneurial activities tear down the old rules, old procedures and policies, and on these ruins are built new rules, new procedures and policies. In this sense, it is possible to understand the concept that Austrian economist J. Schumpeter called "creative destruction": *A bird is born from an egg! An egg is the world! Whoever wants to be born must destroy the world!* The philosophy of this example was similar to thinking about changes, especially in today's global world. Changes have their philosophy of origin and life, destruction and birth of something new, initiative and spontaneity. The initiative is the foundation of spontaneity. Initiative is like lokomotive of the new economy. Without initiative there is no creation of a new. How could a bird get born from an egg, if it's not to break its old world: an egg shell? This example obviously shows that it is not possible to simultaneously

preserve the egg and give birth to a bird! That is an actual characteristic of creative destruction, the essence of its philosophy: the old must be sacrificed! The price must be paid! Hence the changes have their price. And that is the price of development.

Once upon a time we lived in a world which did not accept this philosophy, a socialist world constructed in the framework of dogmatic rules. This world did not give innovations, nor contribute anything new! That was its main failure! Socialism of this type has collapsed through conscious regulations, not accepting spontaneity nor the order of nature, prohibiting spontaneity, and pushing away the invisible hand of development and progress. The new companies were created by the decision of the committee and the public authorities. There was no individuality, nor rules of nature.

Today's worldwide transition takes place through creative destruction. This process is reflected, as we said before, on every individual, every group, every company, and every government. Thus, at micro and macro level, the old (old epoch) is discarded, and the new is accepted and developed – new world, new technologies, new organization, new management... Companies are forced to implement new ways of organization and business management. In addition to the visible changes in structuring the organization of the company, new forms include systems for collecting, storing and allocating resources, and also controlling the behavior of employees and partners in the region. The new model of company organization allows efficient solutions to a very complicated problem of coordinating and motivating large numbers of people. It enables effective functioning of the company on a global level.

Changes are the fate of the companies in the process of globalization. Changes effect the scope of activities, the nature of relations with customers and suppliers, the management levels, the motivation and coordination approach, the method of work at the micro level, adoption of organizational learning. Changes result with a new techno-economic base. This new base has three main features: **1)** due to expensive energy and relatively inexpensive information input, there is a shift toward information-intensive than energy and material-intensive products; **2)** the water changes toward flexible systems that can provide a wide range of products; **3)** greater integration of system functions within the organization, and between suppliers and customers. Organizations must review their goals and operations. This is one of the reasons for the creation of new organizational forms, radically different from the past. *Contrasting the old and the new, we*

find that important in the new is not physical but mental power; ability to intelligently use the information, to create ideas that give value and support the competitiveness (Burnes). Companies are organized to adapt to constant change. This means the systematic abandonment of what has already been firmly established and commonly used, whether it is about products, services or processes, human and social relationships, skills, or organizations themselves.

Organizational innovations through transformation have become the necessity and urgency. If properly implemented, they lead to an improved economic performance. Moreover, they are fundamentally changing the way of doing business. The new economic trends need creative skills.

How to acquire new knowledge? It is one of the main issues in the understanding of transition and development in general. But knowledge is not enough! Action is needed, and the energy that will lead to action. Knowledge, if not used, will not change the reality! So, where is this energy for change and use of knowledge? Primarily in individuals who have the initiative, who can and want to change, who are able to manage change because they have the knowledge. That is the energy of new economy, an economy that uses resources for the improving the new management, new organization, and new institutions. Those are institutions that provide freedom for individuals and organizations, and rules equal for all.

The new economy is primarily an entrepreneurial economy, and that means open, innovative. It is based on the ideas of Adam Smith - the idea of the invisible hand that was suppressed during the 20th century by another idea - equilibrium (balance). It is a known idea, even old-fashioned and outdated. But is it really so? Would the world be any different if this idea was accepted?! Economic growth would be achieved, through implementation of this idea, and thanks to the development of things that no one has planned nor directed in any way! Adam Smit said: *Everyone intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. Nor it is always the worse for the society that it was no part of it.* (Wealth of Nations: 456) The mechanism of the invisible hand could be described as follows: *When the attribute of human nature and the circumstances correlate, they activate the flow of events that occur by themselves, as if regulated by an invisible hand of a master, leading to effective results.*

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This mechanism means that the economy should be based on the interest of individuals which is realized through the market. This interest comes first, that is, an individual will follow the interests of society if he achieves his interests through them. The suppression of this philosophy led the world economy into stagnation and slow development! Only releasing the power of spontaneity through market mechanisms leads to radical changes and turbulent technological development. The same was in the beginning of the industrial era. The same was after leaving the industrial era behind.

The new economy is not linked to the balance and the principle of optimization, nor to the already existing state. It is linked to the future, to the new, to the improved. But the question arises: How much space is needed for the new economy? New Economy accepts Smith's theoretical assumptions, which have been known more than two centuries. Is this market mechanism going to be suppressed again, even in the new economy? No. The new economy is encouraging structures which support the spontaneity, individuality, and development. The development of new structures is a process that is evolutionary, and takes place inside - through expansion of the labor division, through the discovery of new profit opportunities. However, with disturbance of balance.

14. HOLISTIC PARADIGM – CHAOS AND COMPLEXITY

We see that today's world is a very complex system. Clearly, there are many interrelated variables, which provide dynamism and unpredictability. The results are not achieved in a way that we expect. A small change in one variable can make large and unexplained changes elsewhere. Many sciences, such as economics, are still dedicated to the old values. Economic education is still spinning inside the frames of old paradigm. They seem to be helpful, but only in uprising new questions rather than finding answers. Can the thesis of physics help in creating a paradigm of the global economy? Physics gave rise to new ideas after Newton, who has laid its foundations in the 17th century. Of the many new insights after that, none was more important than Einstein's theory of relativity. His radical theory did not exclude Newtonian physics, but enriched it with new knowledge. Maybe we can find a connection between ideas of Newton's physics, and even Einstein's physics, with ideas of the old economy.

If we go back to mechanistic paradigm, we can find an analogy of classical economy with Newton's mechanism of motion in the universe. Consumers represent the Sun and the planets; personal interest may be considered as gravity, and general balance of economic forces, that is, the price, the consumer and the amount can be compared with the movement of the planets in the Solar system. Mechanical approach has become the basis for the economic theory.

New developments in the economy, and the new practice, can not be explained through the prism of classical ideas. This classic prism of ideas has originated from the mechanistic paradigm. Mechanistic paradigm is an understanding of the world that matter, nature, and man himself are functioning as a machine. The basis of that view has been created, as we

have seen, by Descartes, Newton and Bacon, 300 years ago. Newton has proved through mathematical equations, starting from the atom, which initiated the gravitation, that the universe was a machine. According to this view, everything is determined: causal event is predictable, that is, every cause has its precise consequence. The economic life and economic science rested on this perspective of the world. In explaining economic phenomena, according to the economic equilibrium all actors in the production and on the market are completely balanced, devoted to the general conditions of justice, because no one takes from the others, there is no gain at the expense of someone else's loss.

However, conditioned by a new knowledge in various fields of science, especially physics, comes through a new understanding that rejects determinism. Instead of rigid mechanistic relations (machines) used by classical physics, the new knowledge and concepts are in the forms of probability. Understanding of quantum physics (Max Planck, A. Einstein, N. Bohr, et al.) shows that the atoms, which are expected to be small material particles, solid and rigid, consist of a space in which even smaller particles - electrons – orbit the core, and that the subatomic units occur in the form of the double: such as particles or waves. Furthermore, it was proven that the exact position of the subatomic particles in this area is not known. That position is not determined, and the static is not the answer. The answer must be sought through observation, not just subatomic particles, but also the relation between them. These relations are stochastic, but not deterministic; unpredictable or predictable, but only with a certain degree of probability. New understanding has resulted with different interpretation of nature, starting from static observation of things in the dynamic forms and holism. Holism does not consider the universe as a machine with a pattern of cause and effect, but as a dynamic unit characterized by self-organization and complexity. Within this dynamic whole, the matter is still fluid and significant.

New findings have had the far-reaching effects on all aspects of science. In economic consideration of reality, the neoclassical theory of general equilibrium begins to include new elements: information and probability. In addition to the enormous impact on the understanding of economic reality, viewed from the standpoint of business and its management, new understanding of economy particularly emphasizes the importance of intangible resources and networking, as well as a new

organizational structure. In addition to intangible resources, capital, labor and raw materials, there are also resources of information, the time and the space, which become the basis of the new development.

Similarity between quantum physics and global economy probably could be found. However, the question regarding extent of that similarity remains. Quantum physics describes the behavior of quantum chaotic coincidence. There are many variables and complexity. Predicting the future with any certainty of likelihood is impossible.

Another analogy of the global economy and the physics may be drawn with the world of chaos and complexity. The complexity contains many non-standard variables that affect the outcome of the activity.

The concept of chaos was created with early computer programs for weather forecasting. American meteorologist **Edward Lorenz** has made a simple model for monitoring the weather events (simple in terms of modern standards). While using the model, he noticed that small changes in initial values (for example, small differences in several decimal places) make big differences in the results. Lorenz has published academic work *Does the Flap of a Butterfly's Wings in Brazil Set Off a Tornado in Texas?* This so-called *butterfly effect* has caught the public attention. Despite the great discussion, the answer was NO. The effect of flapping butterfly's wings is so small that it is being dumped in the system before it spreads - and tornadoes are relatively localized weather systems - but the basic idea was valid, having a great influence on the science of weather forecasting. It was probably the best attempt to tame the chaotic randomness.

Indeed, weather forecasting is an important activity – but more important is the ability to control the weather. **John von Neumann**, a Hungarian-American mathematician, inventor, physicist, polymath and computer scientist, was delighted with the discovery of delicate balance of time, since he initially had that type of behavior in mind – where a small change in the initial event reflects significantly on the final outcome. He imagined that, if the weather are finally in balance it should be easy to "push" the weather system towards one way or another, in order to get the wanted results.

However, Von Neumann in the beginning did not understand that the time was not so simple. Yes, it would be possible to influence the first final equilibrium result - but it would have launched the entire new series of final balanced outcomes. These outcomes would not be heading in one direction, but in all possible directions.

The Chaos Theory

The theory that describes the unpredictability is the Chaos theory. Many large systems with numerous factors affecting the outcomes have this kind of chaotic behavior – for example, the weather forecasting, the book sale, or events on the stock exchange, etc. Generally, this is the kind of coincidence which is not entirely a coincidence. Because, if we have knowledge about, say, the weather, we could predict how it will behave. But, given that in reality we always work with simplified models, we can not predict the dramatic outcomes of chaotic coincidences. Therefore, the results would always have new twists. In classical Newtonian physics, it is possible to calculate how fast will the leaf fall from the tree, and where will it fall, but under the condition that everything else remains constant. This experiment may be measured, based on the direction of the fall, or the importance of its interactions with the leaf? How fast is the wind? From which direction the blows? What is the shape and the thickness of the leaf, and how all that affects the its movement towards the ground? It's already seen: a simple fall of the leaf has become a complex event, which can be predicted and modeled with great difficulty. It can also be simplified, but the question remains: to what extent the final results will end up being generally distorted?

Such volatility in nature can be expected. We experience it in everyday life. Even the poets have described it in their verses. Each of us is aware of the consequences that small events have on our future. Based on this awareness emerged stories: fairy tales about the good princesses, or fictions about the small pleasantries for the poor people, or modern stories such as the film *Sliding Doors*, with two possible outcomes, depending on whether the main actress (Gwyneth Paltrow) would catch a train or not. We all know that even small decisions have consequences, and we must be aware of what effect they can produce. The consequent outcome of our daily actions, too, the effect of chaos, such as weather forecasting, or the sale of books, or the stock exchange; but, it somehow is comforting that we are not able to predict our own future.

The fact is: if the coincidence creates discomfort to us, the chaos will drive it much further. At least we can predict future results of numerous

coincidences. Still, in case of chaos it is different. Increasing input in chaotic randomness of weather in forecasting the weather, occurs in a time period. For example, the forecast for one or two days can be surprisingly accurate; the forecast for five days is likely to be correct, but a longer period of time reduces the possibility of prediction. Therefore, the models of weather forecasting are moving away from the reality as the time taken for the forecast increases. American economist **Kenneth Arrow** has reached the same conclusion, while dealing with weather report for the US Air Force during the Second World War. A team of meteorologists tried to forecast the weather for one month in advance, which is, as we know, prevented by the chaos. Although forecasts for longer periods of time were not good, Kenneth and his team found that chaos must be taken into account even in the process of weather forecasting. However, the traditional forecasts had never taken chaos and its contribution.

Kenneth has combined several models with different initial conditions (small differences), and the weather forecast was performed as an "ensemble" of models, varying by a small initial differences. For example, if we engage 50 models with small differences in initial conditions, and the probability that each of them will happen, and 30 of them forecast the rain, 20 of them forecast dry weather, we can say that there is a 60% chance for rain. Hence, these models are quite complex and imprecise, but they could be more accurate than the traditional (mechanical) models.

Nowadays, the weather is relatively well understood system, covered with statistics, which helps the prediction. If we look at another chaotic system, for example, the sale of various books, we will meet more difficult scenario for prediction. We need results on how many copies of each book is sold during certain period of time, and that is very little information about the variables to enter the prediction model. Furthermore, it is difficult to specify these variables.

Influences on selling books include marketing, the degree of book visibility in bookstores, the media coverage, disposable income, etc.. It is a very complex system, which includes the book buyers, bookstores and publishers as well as different variables, which make any attempt to predict difficult.

To demonstrate the complexity of predicting the sale of only one book, for example, imagine the e-book whose price is reduced by 9% in order to promote it. And it sells. It may seem that this is simply a result of the relation between the price and the sale, but it is not that simple. Using this kind of promotion may help the increase of sale, more than the change

in the price indicates. Promotion improves the visibility of the book. Now, the book is more visible, but also goes with a special offer. This can increase popularity of the book and make it bestselling, also gaining a larger market in this way. This loop confounds the prediction. To add the overall complexity: imagine all this but with lots of books, in lots of bookstores, including other kinds of public sale. Similar to weather forecasting - small variation of initial variable can make a large difference in the outcome, without even knowing the initial variables essential for selling books. And there are lot of them. Thus, the "ensemble" forecast is inevitable!

With the growth of mathematics of chaos it became clear that it can be applied to more and more situations, including more and more disciplines.

Benoit Mandelbrot was a young mathematician and worked at IBM Research Center in Yorktown Heights, New York. One day he noticed that the distribution of income from the sale of cotton does not fit into a standard statistical schedule. He was shocked to discover the same behavior in distribution of the cotton prices. These prices were ideal for the study because they were documented few years earlier.

Until then, mathematicians and economists assumed that the behavior of the cotton prices in the long run depended on changes in the economy (e.g. new trends in the use of fabrics and the like), while in the short run depended on the market trends, random fluctuations up and down. It was expected that those fluctuations had normal distribution, but it was not the case. There were extreme price jumps. The traditional approach ignored these extreme fluctuations and concentrated on trends. But Mandelbrot realized that such an analysis took him back to the beginning of things, that prediction was not sufficient, because it did not provide knowledge to predict the movement of prices. That was later identified as chaotic behavior, however, there were dramatic deviations from the normal statistical schedule. A normal statistical distribution of the data simply could not explain what was happening, and why did extreme fluctuations occurred.

After studying the data, Mandelbrot discovered strange randomness in those phenomena: there was no regularity, and nothing could be predicted. Basically, it was chaotic randomness. Mandelbrot found that the changes in the price of cotton occurred by chance. Any specific application did not happen by accident, without possibility to be predicted. However, when the data were analyzed, not daily but weekly or monthly, there was a

certain regularity. Thus, if we look at changes over weeks or months, there is a pattern of changes that varies up or down. This does not facilitate the prediction of individual pricing, but allows the assessment of what should be happening in the long run.

Why is the Chaos Theory Important?

Where chaos begins, classical doctrine ends. Tendency towards reductionism prevails in the classical science, but the Chaos theory sets trend for observing the bigger picture. Chaos eliminates Laplacean fantasy of deterministic predictability. The final question is - how is create order in a universe that is affected by the power of entropy, which in turn slides into disarray?! However, questions about life seek equal answers.

It all started with **Alan Turing**, the great mathematician who has offered the basics of artificial intelligence – and the famous test: *Can machine think?* In 1952, he published a paper on morphogenesis. According to him, a mathematical formula defines the development of a living through self-organization. The equation is very simple, but gives rise to complexity. It is worth to note the *Butterfly Effect*.

It has long been known that little things can cause big problems through series of events. Here is how it has been described an English medieval poem:

*For want of a nail the shoe was lost.
For want of a shoe the horse was lost.
For want of a horse the rider was lost.
For want of a rider the message weas lost.
For want of a message the battle was lost.
For want of a battle the kingdom was lost.
And all for the want of a horseshoe nail.*

It is necessary to clarify that the chaos and instability are two different things. A chaotic system can be stable if its specific irregularity remains within the small limits of tolerance. Robust but strange.

Interestingly, development of the Chaos theory is fundamentally tied to the growing computing machines, whose creation Turing contributed, among others. Development of Computing gave hope that it may be possible to accurately predict the time. The Chaos theory will show that these hopes were forlorn.

Further studies of chaos lead to the new insights of the Chaos theory. Particularly dominant in this field was a researcher Robert May. He has indicated the importance of new knowledge: *Not only in research, but also in the everyday world of politics and economics, we would all be better off if more people realize that simple non-linear systems do not necessarily possess simple dynamic properties.*

The greatest contribution to the Chaos theory gave the man who discovered fractals and the strangest diagram that math has ever seen - **Benoit Mandelbrot** (who was mentioned before). Unlike the most mathematicians, he approached the problems through intuitive insight in patterns and shapes. He did not have much confidence in the analysis. According to him, every single change is random and unpredictable. But the way of changing thread is the same for large and small intervals. That's why we say that *Chaos is an essence of Order*. The variability of the cotton prices was constant during the world wars and the economic crisis. The same principle applies to noise in communications, water level and other problems. They could be presented in strange forms to already known mathematicians - such as *Cantor dust*.

Mandelbrot asked a question: How long were the shores of Britain? He answered that it depended on the length of a meter used in the measurement - theoretically it could be infinitely long. So he came to the strange idea of dimensions in fractions, but not the same as those dimensions were perceived previously - 0,1,2,3 ... In the winter of 1975, while flipping through his son's textbook he found the Latin name for this phenomenon - fractal. The idea that the numerical result depends on the attitude of the observer towards the observed object was fully in the spirit of XX century physics. Similar repeating is symmetric, but not in relation to the axis of symmetry, but in relation to the change of scale. Such symmetry means to go back to basis, to re-emerge within the same form ...

Nature operates that way. Fractal nature is in the alveoli in the lungs, in urinary system, or the fibers in the heart that transmit impulses.

Such architecture is complicated only from the perspective of Euclidean geometry. The description is very simple - pure simplicity. A few bytes of information are sufficient - a line of code! Clearly, DNA does not contain huge amounts of information to describe each alveoli, bronchi, capillaries... But it contains information on how to perform the process of bifurcation and development. The so-called strange attractor is one of the

most powerful inventions of modern science. It exists in a phase space similar to an orbit, which attracts other close trajectories of system development. In the past, the chaos concept was related to the physical systems with a large number of variables - the level of freedom. Now we see how the chaos conquers even simple non-linear systems.

Conclusion: The system is deterministic, but its next move can not be predicted! It is a spontaneous emergence of a self-organization. An unpredictability. Increasing entropy. And the creation of information where there was no information. Really strange, but that's the way it is! How is it possible that aimless energy flows bring life and intelligence to the world?! Evolution is the chaos with the feedback. The universe is a huge randomness tumbling to the full and final disarray. But, the randomness which is directed can cause an astonishing new complexity.

In the early years of understanding the chaos theory, there was an idea that the new mathematicians could transform the way we see the world around us. This theory certainly influenced the change of patterns in the mindset of a man and a nature. A step further in understanding the universe is the theory of relativity and quantum theory.

Chaotic Randomness and Uncertainty

Generally speaking, there are two types of randomness: the classic randomness and chaotic randomness. In the first case, with Newton's help, we can accurately predict the outcomes. In theory, it is possible to imagine the model of chaotic randomness for the real world. But in practice it is difficult due to complexity of the data themselves. For example, it is practically impossible to model some kind of system that will support the decision which book will be a bestseller, and which will not. It includes collecting of data, and testing such a complex model. The real world continues to amaze us with the depth of its randomness. Physics of the 20th century reveals that there is a randomness in the heart of reality.

Max Planck realized that the light and other electromagnetic waves were emitted in discrete packets of energy, which Einstein later called "quanta". He was 42 years old when he suggested this theory (1900). It was contrary to Newton's, but Planck was not satisfied with it. Einstein used this theory to explain the photoelectric effect and did not care about keeping the old idea. The photoelectric effect was explained by the fact that light has quantum nature. Planck's and Einstein's work was the beginning of fundamental physics, something that has changed opinion on the universe in

its core. The next step was done by Danish physicist **Neil Bohr**. He has turned Einstein's idea upside-down, and used it to explain the structure of an atom. Bohr wondered: *Why atom only absorbs the light and reflects it in "pieces"?*

Bohr's idea was that electrons "buzz" in the outer orbits of atoms. At first it seemed like a tiny atom of the solar system, in which electrons are like planets orbiting around the Sun. Bohr realized that if electrons move like planets, circling in the orbits of atoms, the electrons of any atom would lose energy, which would cause their "fall" into the nucleus of an atom, and that would lead to an end of all things.

Bohr has solved this using the idea that electrons can move in fixed orbits or paths. The electrons suddenly leap from one track to another, and thereby release the light, a photon. This has helped understanding the phenomena that each atom emits a specific color. Bohr's ideas have made a revolution in physics - a small concept has evolved into a whole new science on how small particles, the size of atoms, photons and electrons, actually exist. It has been discovered that the light itself could look like particles, but also the components of the whole could behave the same way. The research of quantum resulted with **Heisenberg's uncertainty principle**. Heisenberg's uncertainty principle gives in the form of precise inequality that certain pairs of physical properties, like position and momentum, can not be simultaneously measured with arbitrarily high precision. The more precisely one of the quantities is measured, the less precisely the other is known. In order to predict the future position and velocity of a particle, it is necessary to accurately measure its present position and velocity. The obvious way to do this is to highlight the particle. It will reflect a portion of light waves, which will indicate its position. However, the position of a particle can not be more precisely determined than the amount of space between two wave crests, thus it needs to use the light of short wavelengths in order to precisely determine the position of the particle. According to the Planck quantum hypothesis, arbitrarily small amount of light can not be used; at least one quantum is required. This quantum will disturb the particle and change its speed in a way that can not be predicted. Hence, the more precise is the measurement, the shorter wavelengths of light are used, and the energy of one quantum is higher. Thus, the velocity of the particle will be disturbed to a greater extent. In another words: the more precisely you try to measure the position of the particle, the less accurately you can measure its speed,

and vice versa. Heisenberg showed that the product of uncertainty of the particle position, the ambiguity of the particle velocity, and the particle mass can be smaller than a certain size, which is known as Planck's constant. This restriction does not apply to on the way you try to measure the position or the speed of the particles, nor the particle type. The principle of Heisenberg's uncertainty is a fundamental, inevitable feature of the world.

The uncertainty principle has impacted our view of the world. Even now, many philosophers have not yet become aware of this influence, so it is still the subject of serious controversy. The uncertainty principle has marked the end of a dream of the theory of science, of a model of the universe that would be completely deterministic: evidently, future events can not be accurately predicted if the current state of the universe can not even accurately measured! Thanks to a new view at the real world, during the twenties of the 20th century, Heisenberg, **Erwin Schrödinger** and **Paul Dirac** have reformulated a new theory which became known as quantum mechanics and was based on the uncertainty principle. According to this theory, the particles are no longer separate, and they do not have very specific positions and impossible-to-monitor speed. Instead, they have a quantum state, which is a combination of position and velocity. In fact, the particles are no longer just particles, and the waves are not just the waves. Quantum theory has introduced dual nature of the matter where every particle attributes a wave of a certain frequency, and to each wave is attributed the corresponding corpuscular structure.

Newtonian physics was guided by the axiom that if you knew the position and velocity of every atom in the universe, using Newton's laws, you could absolutely determine the precise evolution of the universe. However, the uncertainty principle has denied it all, arguing that the future of the universe was impossible to predict. For example, we can not determine the exact moment of decay of uranium atoms, only the probability.

Many great physicists have not accepted the quantum theory and the uncertainty principle. The great thinker Albert Einstein is among them. It was unacceptable for him that reality had a probability in its essence.

Albert Einstein's Ideas of Relativity (1879-1955)

It's not often that a genius is immediately recognized. Albert Einstein was the biggest theoretical physicist of all time. While he was in elementary school, his teacher said to his father: *Nothing will become of him.* When

Einstein was in his mid-twenties, he could not even find a decent teaching job, although he had graduated at the Federal Polytechnic Institute in Zurich. He quit and stopped hoping that one day he would get an university engagement, and applied for a temporary job in Bern. With the help of his colleague's father, Einstein managed to obtain clerical position at the Swiss Patent Office. He worked six days a week, earning \$600 a year, while preparing a PhD in Physics at the University of Zurich.

During his early years in the Swiss Patent Office, Einstein spent most of his free time studying theoretical physics. He put together a series of four scientific papers that have prompted some of the most important ideas in the long historical quest for understanding the Universe. The place and the time will never be perceived the same way again. Einstein's work has initiated the founding of the Nobel Prize for Physics in 1921.

While Einstein was contemplating the Universe, he would occasionally get flashes of wonderfully deep understanding of things. *Thoughts did not come in any verbal formulation*, he once said. *I rarely think in words at all. A thought comes, and I may try to express it in words.* Until his death in 1955, Einstein searched for a unified theory that would, in one set of equations, link the phenomenon of gravitation and electromagnetism.

Albert Einstein was born in Ulm, former German state of Wurttemberg, on 14th of March 1879, and grew up in Munich. He was the son of Herman Einstein and Pauline Koch. Einstein's father and uncle were owners of an electrical factory. Family thought that young Einstein was "slow", because he had speech difficulties (probably dyslexia).

Einstein was good at school. He did not like restraint and he suffered because he was one of the few Jewish children in a Catholic school. This feeling of exclusion he will often experience throughout his life. Science was one of Einstein's early love. He remembered how his father had showed him his pocket compass. He was only five years old, amazed by the needle permanently pointing north, even when the box was turned. *Something deeply hidden had to be behind things*, Einstein remarked.

In 1895, he dropped out of high school, one year and a half before the final exams, not saying anything to his parents, assuring the school administration would let him go due to a medical certificate obtained from a friendly doctor. He went to the entrance exam in the Federal Polytechnic School in Zurich, where he hoped to become an engineer of electronics. He

wrote about his ambitions: *If I were to have the good fortune to pass my examinations, I would go to Zurich. I would stay there for four years in order to study mathematics and physics. I imagine myself becoming a teacher in the branches of the natural sciences, choosing the theoretical part of them. Here are the reasons which lead me to this plan. Above all, it is my isposition for abstract and mathematical thought, and my lack of imagination and practical ability.* Einstein failed the artistic part of the entrance exam and never got enrolled. The family sent him to a lower school in Aarau, Switzerland, hoping that it would give him another chance to enroll in Zurich school. So it was, and Einstein graduated at the Polytechnic School in 1900.

Year 1905 marked wonderful time of his life. That year he published four epochal scientific works – even without the resources that would provide him an academic appointment. In the spring of the same year, Einstein submitted three papers to the German magazine *Annals of Physics*. All three papers have suddenly appeared in the 17th issue. Einstein described the first paper as revolutionary. It dealt with the phenomenon of quantum (fundamental particles of energy), discovered by Max Planck. Einstein explained the electric-photo effect: during the liberation of each electron some amount of energy is released. That is a quantum effect: the energy is transmitted in fixed amounts that can be expressed only as integers. This theory formed the basis for a larger part of quantum mechanics. Einstein postulated that light consisted of a set of independent energy particles, but he did not provide experimental data.

Physicists were initially reluctant to accept Einstein's theory, which greatly deviated from accepted scientific ideas of the time, and even more from Planck's discovery. Einstein's first work entitled *On Heuristic Viewpoint Concerning the Production and Transformation of Light*, won him the Nobel Prize in Physics, not his work on relativity.

In the second paper - *A New Determination of Molecular Dimensions*, which Einstein wrote as his doctoral dissertation, and the third - *On the Movement of Small Particles Suspended in a Stationary Liquids Required by the Molecular-Kinetic Theory of Heat*, Einstein gave a method of determining the size and movement of atoms. He also explained brownian movement, a phenomenon described by the British botanist Robert Brown during the study of erratic movement of very fine pollen particles suspended in water. Einstein concluded that this movement caused collisions between atoms and molecules. At that time, the very existence of atoms was the subject of scientific debate, so the importance of these two

works could not be stressed enough. Einstein delivered proof for the atomic theory of matter.

In his final works from the same year, entitled *On the Electrodynamics of Moving Bodies*, Einstein introduced what would become known as the *Special Theory of Relativity*. This work was more of an essay than a scientific communication. It was entirely theoretical and did not contain any notes, nor bibliographic citations. Einstein wrote this extensive paper in only five weeks, but historians of science considered it as revolutionary as Newton's *Principia*.

What Newton did for our understanding of gravity, Einstein did for our perception of time and space. Apropos, he managed to refute Newton's conception of time. Newton wrote: *Absolute, true and mathematical time, of itself, and from its own nature, flows equally without relation to anything external*. Einstein claimed that all the measurements should be the same, regardless of the speed. He also asserted that the mass was not immutable, but that it increased with its acceleration. Later experiments confirmed that small particles of matter, when accelerating to 86 percent of the speed of light, had twice the mass than in a static mode.

Another consequence of relativity was the famous mathematical equation on the relation between energy and mass: $E = mc^2$. This equation – energy equals mass times the speed of light squared – has led physicists to understand how even a smallest quantity of substance potentially can provide a tremendous amount of energy. Total converting of only a few atoms into energy would result in a huge explosion. Thus, Einstein's seemingly modest equation has led scientists to consider the consequences of splitting atoms (nuclear fusion) and, with the encouragement of their governments, to develop an atomic bomb.

Special theory of relativity has radically changed the concept of time and mass. However, *General theory of relativity* has changed our concept of space. Newton wrote: *Absolute space, in its own nature, without regard to anything external, remains always similar and immovable*. Newtonian space is Euclidean, infinite, and unlimited. Its geometric structure is fully independent of the physical matter therein. All bodies in it gravitate toward each other without effects on the structure of space. By contrast, Einstein's General theory of relativity says that the gravitational mass of the body affect not only other bodies, but also the structure of space. If the body is

The ray of creation

massive enough, it encourages the space to bend around it. In that environment it seems that the light bends.

15. ENERGY OF THE CREATION OUT OF DISCOVERING THE STRUCTURE OF NATURE

Similarly to physics, the industrial revolution provokes new ways of thinking about the creation and the other sciences, often revolutionary. Darwin, for example, came on the scientific scene with a theory which refuted a conventional wisdom that God created the world. Darwin started the process of discovering the origins of life on Earth. We can only imagine how much courage was needed to reveal his conclusions. Therefore, we are convinced that Darwin's *The Origin of Species* has changed human understanding, mindset and perspective. Can we say that this discovery has to do with the secrets of the Universe, especially Newton's, or the overall environment caused by Industrial Revolution, opening the book of nature, and turning it into a laboratory for learning? Probably both, because the teachings and the life are always connected. That was impressive and obvious at the time of a serious hunger for knowledge. Logically, the cognitive power of man was expanding due to the expansion of the imagination about the world and life in general. New issues brought up new questions about the Universe, the nature and the man - on the theoretical and practical level. This has created some new interests. Under the influence of new preferences were discovered new resources, new types of cultivated plants – a need for greater understanding of the world.

Along with Darwin's mission to unriddle so many diverse species on Earth, **Alfred Wallace**, much younger than Darwin, worked on solving the same problem. However, their motives were different: Darwin did it from a scientific curiosity, because he was a wealthy man and secured (undergraduate medical doctor and a member of the British Royal Society). Wallace embarked into the world of naturalists in order to capture plant and animal species into collections, and sell them for good money! Both have

long lived in South Africa and the Far East. Darwin was already back from his first trip with the conviction that the species developed in different directions only when they lived separately. He was looking for an explanation which he found around 1840. The manuscript in which he explained the origin of species was put aside and untouched for 20 years. He lacked the courage or simply wanted to work in peace and quiet. However, when he read Wallace's paper, which he had sent him "to review", Darwin was stunned to realize that he and Wallace came to the same conclusion. After that, Darwin published his work as soon as possible, and managed to pick up the glory of the great discoveries.

His discovery was known as the theory of evolution. According to the Bronowski, it was undoubtedly the greatest invention of the 19th century. Although criticized at first, The Theory of Evolution was later generally accepted. It has changed the perception of the world and the further course of development. We could say that this theory has renewed the questions about the Universe, the man, and everything that interconnects and separates them.

The Ray of Creation has lit the torch of creation. According to the Bible, God created the world in seven days. And everything He created was created for good. There was no return after that. No dialectic! God has all set! However, it turned out that it was possible for physical world, but not for biological. As well. And, was there perhaps an evolution in the physical world, too? A whole series of new questions has emerged, setting a different vision of creation. All this contributed to the development of man's imagination. What connects organic and inorganic world? Is it chemistry? Are these chemical processes? Answers were somewhere in the structure of a matter, and human mind in turn creates visions of the relationship between a life and a matter. We return to the questions that ancient Greeks had asked long time ago.

The idea of origin and gradual development of different species has not just sparked in Darwin's brain - the other scientists had similar ideas long before him. And he decided, consciously, conscientiously and without prejudice, to examine the accuracy of these ideas and to preferably sustain and prove the accuracy of data and facts. It was a long, laborious, and tedious work. Darwin began by being studying and observing the changes on domestic animals and plants. For example, animals have over time gained a variety of features, and Darwin was very interested why it has happened? During the research he concluded that animals and plants had been were under the influence of natural processes. Nature has created individual

changes in animals and plants, which they conveyed to their offspring. Through the history, a man has been taking from the nature according to his preferences and needs. Often unconscious, this selection has created a variety of useful races (e.g. livestock). Darwin have had to ask himself whether such changes had also occurred in nature, without the help of a man? He assumed that such a changes must have happen by small and practically invisible steps. At the time, scientific starting point was that species have never changed, because the various layers of the Earth's crust proved it very clearly – D'Orbigny, Bernard, Agassiz, Pique, Faokner, and the others share the same point of view. The layers, overlapping each other in different epochs of Earth's past, admittedly in negligible parts of the Earth's crust, have preserved the remains of totally diverse flora and fauna. Between these floors were not found any traces of gradual transformations, but quite clear, insurmountable ceilings. The above mentioned scholars have explained that in each separate formation, the whole organic world must have been real again. But, at the end of an era, it was completely destroyed, probably during some kind of catastrophe, which would afterwards get renewed by creating an entirely new flora and fauna. This seemed strange and incomprehensible to Darwin. Therefore, he rejected the theory of catastrophe.

He came up with an idea of gradual evolution of organisms and their successive generations. In fact, this idea had already been born in the head of his grandfather. But an important, crucial question was waiting for his explanation: Who sets the changes that occur in the living nature, in particular, so to speak, deliberate way, in order to develop a strong tree that blooms the organic life on Earth? Who chooses and controls it? Darwin realised: It is a survival! Nature, magnificent and vigorous, is actually the scene of heavy fighting so that all beings could freely develop and reproduce. Every living creature fights for its survival, animal against animal, plant against plant, and only the strongest survive. If it were not so, the Earth's surface would be too narrow, and too small. Nature is ruled by the principle of natural selection: the slightest change, if useful, serves to maintain an individual. However, choices made by a man are artificial. A giraffe example is a nice illustration of natural selection: once upon a time, giraffe lived in South Africa, and its "species" was in many stages of development; due to climate changes, terrible droughts, there was not enough food to sustain life; giraffes were dying of hunger and thirst; in a desperate fight for survival within the same species remained only those

individuals that nature has particularly endowed – among giraffes survived only those with long necks, able to reach leaves on high trees; survivors had offspring, which inherited their individual strength - long neck! This natural selection was transferred from generation to generation, until giraffe gained the characteristic by which we know them today.

Thus, Darwin has demonstrated in his work that nature have been developing for millions of years, creating today's wildlife with its numerous transitional, and extinct species. Along with an explanation why these species were extinct, and other survived, Darwin and Wallace have founded an idea of the development of living things - from simple to those with more complex structure.

Is this idea related to the ideas of ancient Greeks, or with the other thinkers and creators? Where could be found the connection between these ideas? It seems to that the closest to this idea is the one about the creation of elements in nature, known from Mendeleyev's *Natural System of Elements*. This Russian scientist has applied an evolution on the physical matter and concluded that there was order, even in the creation of elements in nature! However, we have to go back to the development of knowledge on atoms and elements.

Atoms and Elements

Atom has become a focal point or a theme for understanding of the 20th century world. In a series of lectures for students in Caltech, **Richard Feynman** (1963) has nicely said: *If, in some cataclysm, all of scientific knowledge were to be destroyed, and only one sentence passed on to the next generations of creatures, what statement would contain the most information in the fewest words? I believe it is the atomic hypothesis (or the atomic fact, or whatever you wish to call it) that all things are made of atoms – little particles that move around in perpetual motion, attracting each other when they are a little distance apart, but repelling upon being squeezed into one another. In that one sentence, you will see, there is an enormous amount of information about the world, if just a little imagination and thinking are applied.*

The ingenious idea on atoms, the finite, indivisible particles that form a matter - which has already been discussed - emerged in the time of ancient Greeks, in the 5th century BC (Leucippus, Democritus). However, 2,000 years has passed until this idea was considered and accepted. Actual

development of the atomic model started by the end of the 18th century, when chemists began to explore the properties of elements.

The story about elements also came from the ancient Greeks. As indicated before, their idea was that everything in nature (all matter) was made of different types of mixed particles of four elements: air, earth, water, and fire. According to the ancient Greeks, these four elements can not be divided to more simple forms. Serious analysis of elements begun in the mid-17th century, especially in the works of **Robert Boyle**, who has brought some new ideas. Boyle was the first to propose that elements could be merged, and thus create a chemical bonds. But he also believed that elements could not be broken down into simpler matter. For example, water is a compound of hydrogen and oxygen, and it can not be broken down into these two elements. However, hydrogen and oxygen are the elements, since they can not be divided further in the chemical process.

Dalton's atomic model was the next big success in understanding atoms, particularly the way in which atoms amalgamate with each other (beginning of the 19th century). Dalton based his model on the discovery that a chemical compound always contains the same weight of its constituent elements. For example, in the water, the weight ratio of oxygen and hydrogen is always 8:1. The key idea is that a merge of two or more atoms create what is called a molecule. Each molecule of a compound contains the same number of atoms of each elements included in the molecule. The water molecule consists of two hydrogen atoms and one oxygen molecule (H₂O).

One gram of hydrogen has more than six hundred billion trillion of atoms, generally in a gram-equivalent of atomic weight. This is *Avogadro's number*. Using the volume of a gas **Avogadro** explained the difference between gases, liquids, and solids. The gas mostly consist of an empty space, with molecules that run through it and collide with each other. In a liquid environment there is no space, so we can imagine that molecules are touching or in the state of constant motion, orbiting each other in an amorphous mass. There is no such motion in solids and, the molecules are always in the same place, except for proportional convulsion and oscillation, some sort of jumping in place. In 1811, Avogadro published a paper in which he put forward the idea that equal volumes of gas at the same temperature and pressure contain the same number of atoms. This later proved to be a good basis for measuring atomic and molecular masses. If

you can determine a number of molecules in a given volume of gas at a given temperature and pressure (standard conditions are usually zero degrees Celsius and normal atmospheric pressure), then you know the number of molecules of gas in these conditions. To determine the weight of each molecule, you only need to measure the gas and divide with the number of molecules. This means that we need to know Avogadro's number, and the most accurate value is slightly above six hundred billion trillion. In 1866, Loshmit gave the first estimation of this number, but Albert Einstein gave even more precise in 1911.

Avogadro's work initiated the development of the kinetic theory of gas (John Herapath 1829, John Woterson 1845, James Prescott Joule, mid-19th century, Rudolf Clausius, James Clark Maxwell, 60-ies of the 19th century). Given the fact that this theory is based on the module of average statistical behavior of a large number of particles, which interact like tiny billiard balls in motion, complied with Newton's laws of mechanics, it has become known as a *static mechanics*. Kinetic theory and static mechanics came into focus of scientific thought in the mid 19th century, and thanks to the development of thermodynamics (literally: heat and motion). Because, it was necessary to solve practical issues - however, the Industrial Revolution in Europe was in the sign of the steam power. The principles of thermodynamics can also be summarized in three general laws: the law of energy conservation, the law of entropy (things are used and consumed), and the law of the relationship between heat and entropy.

Success of the kinetic theory and static mechanics has convinced many physicists that atoms were real. It was a remarkable discovery that elements in nature had their own system (order). All doubts were dispelled at the discovery of regularity in the properties of various elements - the regularity of atom's properties has already been fully explained in this chapter

In the twenties of the 19th century, a swedish chemist **Jöns Jacob Berzelius** made the early attempts in classifying elements according to their atomic weight (mass of hydrogen, the lightest element, was taken as a unit value), but his work was not accepted. The following idea was to create a table (list) of elements with similar properties. It was made by the French chemist **Alexandre-Émile Béguyer de Chancourtois** and British chemist **John Newlands**. In the mid-19th century, they independently offered their versions of this idea, but their work went unnoticed. John Newlands put forward his *law of octaves* in 1864. He arranged all of the elements known at the time in order of relative atomic mass. Then he found that each element

was similar to the element eight places further on. Newlands table showed a repeating or periodic pattern of properties.

However, Mendeleev's table is the most important - because its arrangement of the periodic system is the most appropriate. The first version of his periodic table was presented in 1869, similar to that of Newlands. But Mendeleev complied with the law of periodicity: „The properties of elements are the periodic function of their atomic masses.“

In 1871, Mendeleev gave another, reformed version of the periodic table, based on a modification made just by the law of periodicity. Specifically, he noted that the properties of chemical elements, in fact, periodic functions of their regular numbers! The reformed periodic table had their elements divided into vertical rows – groups, containing elements of similar properties, and the horizontal rows - periods, having elements listed in the ascending numerical order, where the features from the previous row were periodically repeated. In the beginning there were 8 groups, of which seven had subgroups, while the eighth was divided into a triad. There was seven periods, and the system did not contain noble gases.

Mendeleev also predicted some properties of elements unknown at the time, expecting to fill the gaps in his periodic table with them. Most of his predictions proved to be correct, later when those elements were discovered. Mendeleev periodic table has since been expanded and improved by the discovery or by implementation of the new elements, and by developing new theoretical models to explain their chemical characteristics. All the elements, from atomic number 1 (hydrogen) to the number 118 (ununoctium) have been discovered or allegedly synthesized, while elements 113, 115, 117 and 118 still must be confirmed. The first 98 elements exist in nature, although some of them can be found only in trace amounts, or have been synthesized in the laboratory before they were found in nature. Elements with atomic numbers from 99 to 118 are only synthesized or they will be synthesized. Preparation of elements with higher atomic numbers represents a real challenge, but the question is how could the periodic table be modified to meet any new additions.

In the Periodic system of elements, the rows in the table are called periods, and the columns are called groups. Some of the columns have a specific name, such as halogen atoms or noble gases. Since the Periodic system is based on repeating elements, each such table can be used to find links between the characteristics of elements and to predict the properties of

new, undiscovered or synthesized elements. Therefore, the Periodic table, whether it is a standard or in some other form, provides a useful framework for analyzing chemical behavior, and is widely used in chemistry, and the other sciences.

For proper representation of the electron cloud of each atom, one must know the number of electrons in a given atom. When arranging electrons by levels and sub-levels, one must consider *the principle of minimum energy*: when atom establishes the most stable condition, or the state with the least amount of energy, its electrons are placed in an orbital with the lowest energy. Thus, the electrons firstly fill the sub-levels whose energy is lower, regardless of the power level.

So: what is the conceptual and practical contribution of Mendeleev? It is imagination of the hidden structure of atoms, entering the atom! The atomic weight differs from element to element. Why? What does this complex particle – the atom – contain? Thought must enter deeper into the atom's structure. Are there structures in the indivisible atom, as it has been considered so far? What happens inside the atom? If the universe is moving, and the atom is stationary, is the physical world changeless? Is there order in changes if they occur in the physical world? Mendeleev indicates the existence of order in the physical world. A big step has been made to its system of elements, and that is an entry into the microcosm of atoms. That is an entry into the interior of atoms!

Energy of Atoms and Creating the World of Atoms

Albert Einstein has also contributed to the research of atoms. Analyzing Brownian motion, among other things, he claimed that blue colour of heaven confirms the existence of atoms. In a study from 1910, he proved that blue heaven actually was the result of the light scattering by air molecules. Avogadro's number could have been derived from those calculations. And based on the Avogadro's number, we can imagine how much molecules is contained in one gram of air. Just one look at bright sky is sufficient to verify the existence of atoms! Einstein has explained it using cumulative effects of light scattering on individual molecules in the atmosphere.

Convinced in the existence of atoms, physicists have begun to explore its interior. The electron was discovered in the laboratory of Cambridge University (1897). The physicist **Joseph Thompson** "broke" the atom and discovered that it was made of even smaller parts. He said that it

was a *startling assumption about the state of matter divided into even smaller pieces than the atomic elements*. Accordingly, the atom contains electrons. Electrons carry electric charge ("power"). Each element of Mendeleev table has its number of electrons. Hydrogen is the first in the table because it has 1 electron in the atom, helium is the second because it has 2 electrons, followed by lithium with 3 electrons, beryllium with 4 ... etc. Place in the table is called the atomic number, and that number actually represents the number of electrons within a particular atom. From the atomic weight it was transferred to the atomic number, or atomic structure.

New knowledge about the structure of atoms appeared in 1911. In the Royal Manchester laboratory, a physics professor **Ernest Rutherford** has designed the new model of atom. Specifically, he found that the atom had a nucleus at the center, where the main mass of the atom was situated, with electrons orbiting the nucleus. Those orbits of electrons were similar to Newton's view of planetary motion around the Sun. Therefore: an atom is a tiny machine that has energy. The question arises: Where does the energy come from? Could it be produced forever? Is this circular motion similar to the motion of the universe? If planets consume energy orbiting, their paths get shorter every year.

If electrons behave like planets, then they also lose their energy. If this is not the case with atoms, then there must be something that prevents electrons lose energy! But what is it? This has become a new field of research, and Niels Bohr gave the biggest contribution to solving the mystery of atom. Bohr studied the research of Max Planck, who in 1900 (ten years before Bohr's research) proved that in a world where matter occurred in solid forms, energy was transmitted in "packets" or quanta. The amount of energy contained in each quantum of radiation is inversely proportional to its wavelength. A quantum corresponding to short wavelengths takes much more energy than a quantum corresponding to long wavelengths. The relationship between the energy carried by a quantum and the appropriate wavelength is the number known as *Planck's constant*. Energy of a quantum is equal to the quotient of the product of Planck's constant and the speed of light and wavelength. Specifically, there is a limit in the atoms: they are "allowed" to release light in packages with a certain amount of energy for each wavelength. Bohr has merged the two ideas into one: Rutherford's atom with a nucleus and electrons, and Planck's quantum. It was a brilliant idea: the interior of atom is indivisible, but there is a window – atom's spectra! A

spectrum? A set of color! How to explain this? According to Bronowski every element has its own spectral emission, which is not continuous (constant) as a Newtonian, obtained from a white light. Every element is characterized by a number of bright lines. For example, hydrogen has three clear lines in its visible spectrum - red, blue, and blue-green. Bohr described them as the release of energy at a time when an electron in a hydrogen atom moves from the outer stationary (fixed) path into one of the interior, towards the nucleus. While an electron in a hydrogen atom moves along a stationary path it does not transmit energy; however, whenever it "leaps" from the outer to the inner path, the difference in energy between the two positions is emitted as a quantum of light. But an electron can not spirally and gradually fall toward the nucleus. It can "jump" to the higher energy level, while absorbing one quantum of energy. The distance between energy levels depends on the value of the Planck's constant.

In 1932, **James Chadwick** discovered neutron. He proved that the nucleus of an atom consisted not only of the positive *protons* but also of neutron particles - *neutrons*. This has opened a new era in exploring the world of atoms. Protons and neutrons are built of quarks - each of them has three quarks. For the explanation of protons and neutrons are sufficient two kinds of quarks. They were given arbitrary names - one type is called the "up" quark, and the second is "down" quark. These names actually mean nothing - we could give them any name.

Each up quark carries a positive charge, whose size is two thirds of the electron's charge. Each down quark carries a negative charge equal to one third of the electron's charge. Proton consists of two up quarks and one down quark, which together make one unit of positive charge ($2/3+2/3-1/3=1$); neutron consists of two down quarks and one up quark, and its total charge is 0 ($2/3-1/3-1/3=0$).

Interestingly, the quarks are never alone. They come either in pairs or triplets. The quark couples (in fact, the quark-antiquark pairs) build particles called *mesons*, and mesons are precisely those that hold the atomic nucleus together, constantly alternating between protons and neutrons in the nucleus. Entering the structure of atoms, the scientific picture of the world has been completed. To understand the world around us, it is necessary to know the behavior of atoms and its parts (protons, neutrons and electrons), as the basic particles, and the forces that affect them - above all, gravity and electromagnetism. These properties make it possible for the atoms to stay together, even in a complex form such as human body. That's probably a secret of the existence of the universe itself.

Entering the atom has led to an increased knowledge of the microcosm. In the early stages of intellectual development, the man knew only a fraction of it. He did not know the wonders of microscopic world, nor was educated about the molecules, the atoms that form molecules, and the ultimate small world of electrons in atoms. The knowledge on nature has enabled the notion that even inorganic matter contains principles of life. Quantum physics has been developed to explain the behavior of atoms, and has led to a change of the entire world and higher forms of organizing the matter, as well as finding the connection between organic and inorganic forms of it. Nikola Tesla bravely talked about that, before the quantum mechanics has been established as a theory of the atom's behavior. Here are his insights on the relationship between the organic and inorganic world: *Thus, everything that exists, organic or inorganic, animated or inert, is susceptible to stimulus from the outside. There is no gap between, no break in continuity, no special and distinguishing vital agent. The momentous question of Spencer, "What is it that causes inorganic matter to run into organic forms?" has been answered. It's the sun's heat and light. Wherever they are, there is life. Only in the boundless wastes of interstellar space, in the eternal darkness and cold, animation is suspended, and, possibly, at the temperature of absolute zero probably all matter may die...*

The discussed knowledge about the universe and the atom has proved to be valuable for other sciences and their development. The discovery of nuclear energy is undoubtedly a huge step, because energy resources, as a foundation for the development of the world, are limited. Discovering the atoms and its elements has caused the information revolution, which has ushered the modern world into the post-industrial society. Also, a new reality, characterized by complexity as a concept, is more suited to the principle of uncertainty than the principle of causality.

From the standpoint of daily life, perhaps all that is going on deep inside the atomic nucleus has no practical significance. However, crucial to the science is an explanation of our existence, which determines the forces of attraction between atoms. It also depends on the structure of electrons in the atom, and what they induce in some atoms, clustered in molecules, including the molecule of life.

Nanotechnology

The knowledge of the atoms has been an enormous breakthrough in the history of mankind. But the development of a nanotechnology based on the structure of atoms was even bigger. What is a nanotechnology? A nanometer is a billionth of a meter 10^{-9} m (width 3-4 atoms)!!! Nanotechnology represents a molecular manufacturing or, more simply, building the things and objects at the atomic level, so that individual atoms or molecules could be moved. The term was once used to describe any technique capable of dealing with sizes smaller than a micron. Today we talk about molecular nanotechnology, which basically means "placing every atom and molecule in the right place." Also used terms are *molecular structure*, *molecular manufacturing*, and the like. Using the well known physical properties of atoms and molecules, nanotechnology proposes construction of devices not bigger than a few nanometers. The trick is to manage individual atoms and place them exactly where needed to produce the desired structure.

Nanotechnology assumes a complete turn in the construction of devices, producing virtually no cost, using atoms individually, similar to the computers using bits of information. Nanotechnology allows automatic construction of goods and devices without traditional human work, such as a printer or a copier producing an unlimited number of copies without retyping the original information.

Nanotechnology has been formed by uniting a number of fields, some of which had the greatest contribution:

- electronics - downsizing in the manufacture of microchips,
- micro-biology - studying the structure of DNA, studying the vital functions of microorganisms,
- chemistry - working on the production of complex compounds.

In 1959, Nobel laureate Richard Feynman was the first to bring forward the possibility of making such a tiny system, saying: *Principles of physics do not speak against the possibility of maneuvering things atom by atom.*

In short, the answer is: *Because it's possible... Just look at how nature does it.* (Quote by K. Eric Drexler): *If you want to know what molecular nanotechnology is, look at yourself in the mirror.*

The manipulation of matter at the atomic level is the inevitable result of continuous progress in the field of producing chips, biology, and chemistry. Every 18 months or less, the size of wires and transistors in

microchips reduces by 50%, while the speed of chips doubles. Conductors are already the size of a micron particle. Insulators and conductors will soon become so thin that the effects of quantum mechanics will come into use. For example, in the chip production, if you can make mechanical parts atom by atom, they can be a thousand times smaller, and million times faster than existing transistors. Competing with faster chips is a fierce struggle, but profit in the market is huge. This competition results in nanotechnology.

Biologists are very familiar with similar tools described by molecular nanotechnology, such as programmable self-replicating machines, which enable construction with atomic precision. After all, biology is an undoubted proof that nanotechnology exists. A plant seed in its DNA contains built genetic instructions for manipulating the atoms and molecules. Based on DNA data, ribosomes produce proteins and collect energy, gathering atoms from the local environment, and possibly making more ribosomes. If we master the programming of DNA, we can use it to make other necessary things.

Biologists are awed with the fact that soon will be possible to create an evolutionary series, from the first "nano-machines", which needed some 3.5 billion years of natural selection to evolve, to the life on Earth as we know it.

Try to imagine three-dimensional puzzle with trillions and trillions of connected parts. The genetic material, which is a self-replicating pattern of its biological life on Earth, was the focus of researchers, resulting in the ability to manipulate these "nano-machines". Biologists are constantly discovering and improving the ways to change these pre-molecular machines, which is a great contribution to the progress of developing the nanotechnology.

Chemists synthesize larger and larger molecules, performing complicated tasks. There are huge investments in "intelligent synthesis," so that the appropriate materials could be synthesized. Nanotechnology allows chemists to control matter at the nanometer level, continuing to increase the refinement.

Nanotechnology opens the astonishing new opportunities for:

- self-assembly of the used goods,
- nano medicine (end of diseases, aging, and perhaps death)
- cessation of pollution, automatic cleaning of existing pollution,
- molecular synthesis of food (end of scarcity and starvation)

The ray of creation

- billion times faster computers,
- extreme new inventions (still unfeasible)
- access to superior education for each person on Earth,
- reconstruction of extinct plants and animals,
- safe and accessible space travel,
- colonization of the solar system...

16. BUSINESS AND CREATION AND THE SEQUEL TO THE STORY OF THOSE WHO HAVE CHOSEN THIS PATH

The Link Between Theoretical Knowledge and Practice

So far we have noticed a direct and strong relationship between the scientific revolution and scientific discoveries - on one hand, and economy and businesses - on the other. New scientific discoveries and new ideas in science have contributed to the bloom of business, and commercialization of scientific and other inventions. Promoters of new ideas in business are individuals – those who believe in themselves and who have decided not to rely on the others. Imagination is the distinctive feature of individuals who bring ideas and bear the costs of the failure of their realization. In everyday life we talk about decisions of governments, corporations and various organizations, mostly neglecting the fact that those decision are also made by individuals. Agents of change in productive markets are individuals who operate in those markets, whom call them entrepreneurs. They invest their funds, they decide what to produce or sell, they gain benefit from it, and they bear the costs of their decisions.

Entrepreneurial behavior is aimed at improving our job situation. This means abandoning the old - through its destruction at the work level of each individual. Creative destruction encourages action and enterprises. Depending on the intensity of entrepreneurial ventures, the economy enters the cycles of development, affecting the companies.

Entrepreneurship can not be understood from the standpoint of statistics in analyzing the behavior in a particular part of the economy. We have to understand this constant storm of creative destruction, without binding to the present, and without looking at the past or the future. The

current economic systems are the result of the past efforts, and could be seen as the result of creation and destruction, or as the result of entrepreneurship.

Enterprise is based on the competition – of new goods, technologies, sources of supply, the new type of organization and new management approaches, including new approaches to work. Therefore, the role of entrepreneurship in economic development is multiple. It does not only increase output and income per capita, but also makes changes in the structure of business and society. This change follows the growth and increased output, which creates more goods and services for participants in the distribution. What stimulates these changes and development?

According to one theory, that is an **innovation**, which is fundamental, not only in the development of new products and services for the market, but also in interest stimulation in investing and creating new businesses. This new investment affects both sides of the growth equation: a new capital expands the capacity of growth (supply), and the corresponding new energy (new usability) expands the demand.

The idea of business is materialized through the product development process. Product development process starts with the knowledge in the basic technology and science, such as electronics, thermodynamics and mechanics. It ends with a product or service available for purchase on the market. The main point in the product development process is the crossroads of knowledge and the recognition of social needs, which initiates the phase of product development. That point, called the **interactive synthesis**, we often fail to achieve, and therefore the product never reaches the customer.

The ideas (innovations) can have different levels of uniqueness. Most new ideas are only the small technological improvements of existing products. Even lesser is the number of innovations with significant technology improvements.

Theoretically, we can talk about two types of entrepreneurship: 1) routine and well-known, and 2) innovative, which did not exist before. They significantly differ in risk and expected profit. In the case of routine and well-known, the risk can be largely predicted, which is not the case in the innovative. However, these two types of entrepreneurships are not easy to separate in the real life. The routine one often have the elements of innovation; for example, pizza stall, which is essentially a routine investment; but, what if we are the first to put the Chinese spices on the pizza? This may be a trivial example of innovation, but what if it makes an enormous impact on sales? On the other hand, Bill Gates and Michael Dell

have been the undisputed innovators. Although there are differences between these two types of entrepreneurship, we will observe entrepreneurs of both kinds - as examples of carriers of change, with the characteristics of both entrepreneurship types.

The Visible and the Invisible in Business

The entrepreneur needs the knowledge of how the business system works, how the economy works, how does people behave; the knowledge on organization, management and much more. In addition to the theory of the business, the entrepreneur also must use the observations, or continuous monitoring of events that happen in the world. Keeping up with the world on a daily basis is one of the ways to get information about the reality we live in. A thread which I have tried to incorporate into this book, is deeper observation of the real world. This is a message: Lift your head and watch the market, look for the opportunities. A true entrepreneur is "hungry" for data about the environment in which his business is taking place. He constantly collects them, which helps him to gain specific knowledge about the impacts and changes affecting his business. However, although important, these observations are merely personal, unsystematised and unsettled. Therefore, the entrepreneur should follow more objective sources of information. Economic statistics provides the information necessary for an objective assessment of reality. Statistical data are codes of reality that should be interpreted and understood. *The reality is much deeper below the surface than it seems at first glance. We live in the world of pseudo-reality (pseudo-concreteness), the world of appearance, prejudice, superficiality, common sense, our own impeccability, the world of arbitrary knowledge, the world outside the real time, the world of short-term, the world of improvisational solutions! The world of intuition has overcome the world of invisibility! And the essence is always invisible, at least to the naked eye! The bottom line is visible mind! "Don't see with your eyes, perceive with your mind." But we also see with our instinct, feeling, intuition! The world of natural and spontaneous is shadowed by the world of structure! The world of balance seems more natural than the world of imbalance!* (Vukotic).

In business, one needs to keep from superficiality and jump into conclusions based on obvious facts. A character in *Saint Joan* by Bernard

Shaw put forward an "obvious fact" when hearing of the Pythagorean theory that the Earth is round and revolves around the Sun: *What an utter fool! Couldnt he use his eyes?* Therefore, this is a warning for many who react to the new things in a similar way. Do not become part of the mass who think that everything is clear, because they can see it! Try to notice your own and other people's misconceptions, because the business can not be successfully led on delusions. As I write this sentence, a friend entrepreneur calls me on the phone to talk about his problems in business. Later I realized that he has made a mistake in contracting few jobs where everything seemed clear. Those jobs jeopardized his business with branches in several countries. Now it is facing bankruptcy. My friend realized where he made a mistake, but it was too late, things could not be repaired. Thus, this book insists on a systematic approach and consideration of the whole phenomena, because there is an interdependence of factors in the universe, nature and human activity. (Analyzed in one of the previous chapters of this book.)

Here we will cite **Henry Hazlitt** who proved that in business and life, everything is not clearly perceived. This is an example of a broken window, from his book *Economics in One Lesson*. Namely, a little hooligan broke the window at the bakery.

The baker angrily ran out, but the boy had escaped. People gathered as it usually happens, with hidden pleasure looking at the broken window and glass shards on the floor, flour, pastry... A few minutes later, someone said: Well, this boy has done a wonderful work. Some glass cutter will get the job! How much is the new glass? €300! So the glass cutter will receive €300 to buy raw materials, which means that his suppliers will also benefit. And his suppliers have their own suppliers - and so on... By breaking glass, the boy actually allowed earnings to more people. Really, what is the problem here? Isn't it obvious? Let's go back to the Hazlitt's window, and look at it from another angle. Indeed, it is true that glass cutter and his suppliers will receive €300. The glass cutter will be happy to hear that the window is broken. He gets the job, he gets the market! Where does €300 come from? From the baker, who must replace the glass. No, it's money from the tailor! The tailor is invisible! In fact, the baker was about to go to the tailor and give him €300 for sewing a new garment. Instead of having both the window and new suit, the baker now has only the window. So, what the glass cutter got, the tailor lost. There was no new job! People in the crowd were thinking only about the transaction between the bakery and the glass cutter. They forgot a third party, a tailor, only because he obviously was not

on the scene. For a day or two they will see a new window. But they will not see a new suit, because it will not be sewn. (H. Hazlitt)

Thus, we only see what is currently available! The fallacy of the broken window was disguised in hundred ways, as the most widespread in the history of economics. What we emphasize in this book is the holism of the world, and a comprehensive view of the phenomenon. Only a holistic view can see the essence of things, and even the essence of a business.

The broader historical perspective suggests that dynamics and competition are essence of the economy, to a lesser or a greater extent. The needs are expanding. There is no static, only a constant change, constant movement. New needs create new interests and motives to be met through the new consumer goods, new methods of production or transportation, new markets, new forms of industrial organization. This way, economic structure is constantly changing from within, always destroying the old and creating the new. This process of innovative changes is the basis of entrepreneurship. It is the mechanism that drives and maintains the economic systems in constant development.

Inspirational Examples of Entrepreneurial Ventures

Setting up a new business is a form of creation. The mechanisms that inspire an individual to independently, and without inheritance, establish a company, probably are unfathomable to others. An individual (as the creator of the business idea) is an atom of businesses. In spite of increased knowledge about the universe, nature and society, the intelligent atom is the greatest secret to himself. What drives him in the business? Sometimes it is a happy coincidence; more often it is a necessity (troubles); it is always a special energy. Generally, it is the need to be his own master, and also the desire to acquire material wealth.

We will return to the recent past, in the 20th century (although the first entrepreneurship processes have started in the 15th century), to examine the man's determination to implement his ideas and desires.

Henry Ford is a famous entrepreneur, and one of the most meritorious for the development of automobile industry, who made the cars to become a reality. He was born in a family of farmers, of an English-Irish descent. At sixteen he left the family home and began working as an apprentice in mechanical engineering. In 1891, he met with Thomas Edison,

who liked Ford's concept of cars. Therefore, Edison allowed him to use his storage facilities in order to manufacture vehicles. Ford was grateful, but he wanted to build his own factory, to manufacture on his own terms. Supported by William Murphy, he founded the *Detroit Automobile Company* (1899). It was short lived, because the produced vehicles lacked quality and precision which Ford wanted for his cars. On top of all, those cars were very expensive and his business almost collapsed. Yet Ford continued working on his ideas. He nearly failed for bankruptcy due to lousy sales and high debts, but he had found new partners and changed the company name in the *Ford Motor Company*. In 1908, the company commercialized the model *Ford T* and sold 15 million copies in the period 1908 - 1927!

In many countries, especially in America, entrepreneurs have reached positions of national power, prestige, wealth, and fame. How impressive is Bill Gates, who started *Microsoft* and achieved a net value of over one billion dollars before his thirtieth birthday!?! There are many examples of such giants - entrepreneurial legends: Stephen Jobs co-founder of *Apple Computer*, Hugh Hefner founder of *Playboy*, Ross Perot who founded *EDS* and sold it to *General Motors* for one billion dollars! However, it is not necessary to compare yourself with those legendary entrepreneurs if you want to succeed in business. There are many other who are very successful entrepreneurs, extremely rich and professionally satisfied, but they have never appeared on the cover of famous business magazines or been a guest at TV stations or TV networks. Some of them will be presented the section below. All of these examples show that an entrepreneur develops an idea and changes the *nerve center of business*.

Mortimer Levitt was born and raised in Brooklyn. Excluded from school during his third year of secondary education, because he failed the exams in Latin, French and Spanish. He lived in the heart of Brooklyn and did not see a reason to learn verb conjugations of languages that he will not be using very often. After dropping out school, he changed several jobs. Levitt was relatively successful trader, and then lost his motivation. He found that it was not really necessary, nor particularly interesting, to stay, live, and die in Brooklyn.

Levitt often asked himself if he could start his own business? One day he remembered Mermelstein, a tailor whose anatomical peculiarity (slender neck) ensured the success in his business.

One day, (April 1937), while thinking about the tailor's shop where he regularly ordered shirts, because standard sizes did suit him, Levitt made

an interesting calculation: a shirt can be sewn for \$1.30, and sold for \$2, which is profitable. (At the time, sewn shirt costed \$6.) The idea to sell shirts at much lower price than the cheapest producer seemed pretty attractive, even too good to be true, but it increasingly amused Levitt.

He talked about his idea to his wife and close friends. Contrary to his enthusiasm, their comments were mostly negative. Levitt was thirty years old, without status and good prospects, practically he had no future. In addition, he did not graduate at high school, and was constantly changing jobs...

In June 1937, amid such suggestions, Levitt decided to start his own business. He had \$1,000 in cash, he borrowed another \$1,000, and opened his first, small shop for sewing shirts, equipped with nine leased sewing machines.

Despite a rather humble start, customers started to arrive, attracted by interesting shop window and low cost.

Fifty years later, Levitt owned fifty-one shops all over America! He was the only owner - without partners, without shareholders, and, believe it or not, without competition!

Arthur Imperatore was one of seven children of the first-generation Italian immigrants in America. In the last decades of the 20th century, his *A-P-A Company* was the third most profitable company for transportation in America! His story begins very modestly: in 1946, after returning from the military service, Artur Imperator found his two older brothers as owners of the used military trucks. Soon after, his other siblings also bought similar trucks. The brothers joined forces, merged assets and established A-T-A company for cargo transport.

Arthur did not follow their footsteps. He took a full-time job as a salesman during the day, and in the evening he attended college. He worked tirelessly both at work and at school, which was probably the reason for the conflict with his brothers - he neglected family business and was irresponsible in the household.

Arthur always wanted to earn money. He opened his first bank account when he was only ten years old, where he deposited the money he earned doing whatever work available to him. He wanted to be rich!

Since the family business went awry, Arthur decided to drop out of evening school, and help his brothers with the company. The brothers recognized his knowledge, abilities and will, so Arthur soon became the

president of the company. He immediately set the first rule of the company: people with the greatest merits in work will have the right to say the most! Due to the fact that he was the smartest in the family, he took over the business, and decided that their company should specialize in transportation.

Competition was fierce, and yet the business grew under Arthur's leadership. He was energetic and persistent in trying to find a steady source of business. He advertised their company by telephone, and from door to door, offering better quality service, cheaper than other. He worked nine or more hours a day...

A particular reason for the Arthur's unique success was a high profit margin. It was based on his scientific approach to the transport, and his relentless energy. Using the studies of time and motion, he analyzed the actual transportation process from order to arrival of the cargo at its destination. Interestingly, he found 224 separate routes. Based on that analysis, he established an optimal level of performance, introducing daily system of the control, in order to see how much every worker produces at an optimal level. Each worker had to be maximally effective to the system.

Besides, the Arthur has computerized the monitoring system, which was very important. The system was receiving information from the device installed in the truck. Thus the management was informed about all the details: time of departure, number of stops, movement speed, etc.. Arthur showed the individual data to each worker who did not perform his duties according to the business plan. A justified excuse for the failure was accepted, only twice at the most.

Today Arthur Imperatore owns 90% of shares in the *A-P-A transportation*. His wealth is estimated around \$200 million.

For most entrepreneurs, the story of A-P-A Company would be the beginning and – the end. But Arthur Imperatore is a visionary. That was obvious in 1981, when he started buying real estate. Only in New York City he bought 366 acres of land, which is now filled with warehouses and terminals, industrial plants and the like.

Joseph Kohler has taken an incomplete idea, which he had learned by accident, and realized it. He saw the possibility of using towers (for lifts) on the ski slopes, as places for advertising signs! He has introduced advertisements on the ski slopes and earned millions.

Joseph Kohler was born and raised in a country with ski slopes, and from early age he spent winters skiing. In high school he worked as a ski instructor. He graduated in hospitality management at the Cornell University in 1971. Very young, he became CEO of Bristol Mountain, and the

President two years after. In 1981, he quit that position in order to establish his own company. Joseph Kohler is an example of a young man who worked hard, and who seized the opportunity to start his own business when the conditions were met. This is the story of his success.

In the spring of 1981, while working in *Bristol Mountain*, Joseph received a phone call from the Canadian company that needed publicity. Specifically, they wanted to put advertising signs on the backs of the ski-lift chairs. Kohler rejected that idea because it simply didn't satisfy his aesthetic vision - it required a lot of advertising signs! However, thinking about the idea, he came up with a conclusion that it can be the foundation for a new business. He just needed to develop some cheaper and aesthetically acceptable variants.

In addition to poor aesthetics, an advert for the Canadian company had this shortage: very few people would see it - only those who ride in ski-lift and those sitting behind the chair with add signs. He came up to an idea to make a much larger signs and set them on the towers that carry cables for ski-lift. There was a significant turning point in the initially rejected idea. Another idea that will make money was born!

The first buyer of this idea was the Eastern Kodak, followed by the others. In the beginning, Kohler was doing everything by himself (writing advertisements, searching for customers, seeking new ski resorts, etc.). When the business had increased, he included partners. Three years later, Kohler and his partners sold the company for \$7.3 million! Kohler's share was \$2.5 million.

After that Kohler started up a new company specialized in making television commercials, believing that it could have a better future than the first business...

Stew Leonard is an excellent manager who combined and created a unique business. He is the founder and owner of five chains of supermarkets in Connecticut and New York.

Leonard's father was a milkman. Leonard idealized his father and wanted to be a milkman, too. He enrolled at the Agricultural Institute of Connecticut (Dairy Management), but was forced to drop out school in 1951, when together with his brother, he took over the family business.

In the period 1951-1959, Leonard and his brother were managing the dairy, with no major changes in the way of doing business. Leonard enjoyed working with people, therefore he decided to attend the famous business

courses of **Dale Carnegie**. He took them quite seriously, and was particularly interested in marketing. Despite a significant marketing campaign, the family business of processing and distribution of milk failed, primarily due to changed circumstances and state interference.

Leonard didn't lose the motivation. He wanted to maintain the inherited family business, so he visited forty-two dairies in the country to see if there were some opportunities for improvement in the dairy industry. The conclusion was inescapable - he could no longer rely on the dairy business.

When he returned home to Connecticut, a friend told him about a man who was selling milk on the farm at a discount price and doing business very successfully. Leonard was intrigued, he went to the man, and asked to study his ways of doing business. He wanted to interview customers and with the owner's permission he did it. After spending three days on a farm, inquiring on why customers chose to buy milk on the farm instead of in supermarkets, the reasons were these: milk on the farm was fresh (customers were able to watch as it was poured into bottles), and the prices were lower.

Leonard decided that he could do the same thing in his hometown, with some modifications. He understood the essence: milk processing before the customer's eyes had an amazing effect!

Leonard picked the farm near the traffic road New York - Boston. He bought three acres of land and built a factory for processing the milk. The factory looked beautifully with large windows that allowed customers to see the whole process of processing and packaging fresh milk. Leonard was selling the same products as in the previous family business: milk, butter, cream, eggs, bread, etc. The whole business was organized with a particular focus on the quality, fun and friendly attitude toward customers. His farm became famous overnight.

Stevie Israel graduated Literature at the University of Bridgeport, and worked for two years as a professor. He then moved to Woodstock, New York, to the famous art colony, where he was employed as a carpenter. It was a strange twist, but Stevie was quite capable of it.

For five years, in his spare time, Steve was independently building a small house in Woodstock, but when he finished it, he realized that he could not afford to live in it. His income could not cover all the expenses and taxes. He sold the house for 65 000 dollars and for the first time in his life he had money in the bank. Then he decided to travel to the Bahamas.

Although he knew nothing about sailing, he planned to buy a boat and sail around the world. However, faced with the reality, he chose a more rational dream. He bought a small farm in Vermont with five cows, four horses and some poultry. He ran the farm alone, and worked as a carpenter for regular source of income.

In those years, Steve's artistic abilities came to the fore, and that gave him an idea to start his own business. He was more than a carpenter. He made various objects of wood and other materials. He was a collector of accidentally discovered architectural remains - unusual pieces, which were thrown as junk demolition of old buildings. Steve hoped that he would benefit from them someday. This proved to be accurate.

The company officially begun working when he rented a room in Woodstock for two weeks with his business partner. During those two weeks, with a modest advertising, he managed to sell architectural antiques worth \$3,500, and gained several important contacts. His first big sale was related to the stained glass for restaurants. Stevie invested all the profit in this job. He found glass in Boston, bought it cheaply and sold for a double price. Despite the withdrawal of his partner and difficulties in finding architectural waste, the business was expanding, so he opened new sales locations. Stevie had over \$100,000 profit per year and growing.

William Bill Raveis has graduated business administration at the University of Dayton and got a job at *Sikorsky Aircraft*. The company paid for his postgraduate studies in the field of computers. After that, he was offered a job at *Westinghouse*, where he led a project that lasted three and a half years. His bosses were delighted by his result - a brand new computer program. Bill's program was presented at an international symposium, but Bill wasn't mentioned as its creator, in fact – he wasn't mentioned at all. Deeply offended, he decided to never work again for another company but for his own.

He was earning \$28,000 per year, which was a real success for the young man in 1974 (he was twenty-seven years old, and has not yet completed a Master's degree). Bill spent six months in the search for some business opportunities. Finally, he decided to work with real estate, even though he had no previous experience. Several factors contributed to opt for this:

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1. He and his wife bought a new house for \$30,000. A real estate agent charged them \$1,800 fee, for which, according to Bill's opinion, the agent did nothing;

2. Opening the real estate office required small assets;

3. Competition almost did not exist.

However, it turned out that the real estate business was a lot harder than Raveis imagined. Although he had a license for the job (which he gained regularly), he was not accepted by the local real estate board. He needed to have minimum one year of experience to open a commercial office.

For three years he had no success, but he endured. Raveis had an inner strength. He knew he could offer better services than other real estate companies. In addition, he wanted to work longer, better, and he made it. He invested in advertising more than others. In 1976 he opened another office. By the end of 1980-ies Raveis had twenty-two offices in Connecticut, with branches in twenty cities. In 1984, his advertising budget amounted \$2.5 million.

But, William Bill Raveis never stopped expanding his business. He opened the mortgage agency, insurance agency, and his own bank. This whole conglomerate he managed without partners, shareholders or franchisees!

John McCormack is a highly successful entrepreneur, the owner of an extremely successful chain of sixteen hair salons called Visible Changes. The company has increased business, profit and success over the years. In 1988, McCormack was ranked the first entrepreneur in America. His example is particularly interesting for our research, because he really started from the scratch. His entrepreneurial journey allows us to focus on the actual model of his achievements, which can be taken as a model of success in entrepreneurship.

McCormack was twenty-four years old when he became a millionaire, with all the benefits that the wealth gives to a man, particularly a young man. But the following year he was out of the business arena, with a quarter of a million dollars in debt, going through dramatic personal situation.

After finishing high school, he became a policeman in New York, earning around 80 dollars per week. Firstly he worked in Brooklyn, then in Harlem - the two notorious districts of New York. If the Harlem bad guys want to kill somebody, they will do so. The idea of law and order to them is a joke. McCormack experienced several dangerous situations with these

guys, which made him seriously to consider another line of work. Christmas holidays were close, and, having two weeks of vacation left, he decided to earn some extra money by selling Christmas trees. His brother was also a New York policeman. Together they managed to collect \$300 and bought a bundle of trees. Only few hours later they faced the first crisis: most New Yorkers were buying Christmas trees after work, when it was already dark, and they did not have any lighting at the place of the trade. They were out of business! But, John had an idea. He bought a lengthy cable, hooked it up to the trailer, and persuaded a lady living nearby to use her electricity. Finally, the business started. Two weeks later, he and his brother were counting profit. John's share was \$300!

He invested that money becoming a Wall Street broker, but things turned upside down. In less than three months he lost everything he had earned, and even was in debt of \$250,000! Brokerage firm where he worked, one of the largest on the Wall Street, went bankrupt. John was in a desperate situation. For the next nine weeks he was taught by his new business mentor Abe.

John realized that one of the most important things in business was to concentrate on the present and the future, not the past. Abe asked him about business: how many businessmen did he know? Had he ever seen the balance sheet? *Sure*, replied John, *that's assets and liabilities! On the liability side, I put down: Owes 250,000, no job. On the asset side I have: high school diploma, officer's candidate school and the police department academy; I do not want to enroll my experience on Wall Street, because I think that this is not an asset. That is all. Very little. Very little* - Abe agreed. *But, thank God, you know nothing about balance sheet. Apply the following as assets: knowledge of English, reading and writing in English, knowledge of currencies, family, friends, knowledge of New York... Well, even a debt of \$250,000 is an indication of how to get into debt. However, such a balance can not be compared with the balance of someone who graduated at Harvard or Yale, but there are many people who have had much worse balance than you, and have become very successful. You must find them and study, you must learn how they did it, and then you will be ready to do it by yourself.*

John realized that such people can be found among immigrants who came to America with no money, no knowledge of English, no friends, no connections, no nothing, and they managed to become great entrepreneurs.

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Abe was one of them. When he came to America, Abe did not speak, read or write English, he was not familiar with the currency, but he has become a successful and wealthy. On three occasions he became a millionaire. Of course, he believed in himself when nobody else did.

After a year of analyzing the experiences of others, John decided to start up his own business. With a detailed business plan, he tried to impress bankers and get a loan of \$250,000. It was a marathon. All banks have refused him. After 265 rejections, he said to his wife that he should give up. His wife told him that Walt and Mickey, company known for cartoons, did not give up until they got the money for starting a business from three hundred third bank! At that moment, John got a promising call from a bank in Dallae. He spent the last money for the first class airplane-ticket, and went for the interview. Don Weckwerth, the director of the small bank, greeted him at the airport. They talked about the loan in the airport cafeteria. After a thirty-minute presentation, Weckwerth said that he had never seen such a mess of numbers, sketches, projections, and assumptions. However, he approved a favorable loan. John was in business!

He started in Houston, where he made the design for the first hairdressing salon in the popular Greenspoint Mall. He actually wanted to try with the best location in Dallas. After a long and persistent pressure on the general manager, John received an exclusive location, though, not in Dallas - but in Houston. Later, the opening of a new salon on such a good locations went much easier ...

Finally, I will conclude this chapter with an example of a broader entrepreneurial venture from the 15th century. In 1484, Christopher Columbus came to the King of Portugal with the proposal that he, the King, finances the fleet which would sail westward to find a new trade route to the Eastern Asia! Such researches were risky and expensive operation. A lot of money was needed to build boats, to get supplies, and to pay sailors and soldiers - and there was no guarantee that the investment will pay off. The King of Portugal rejected the proposal.

Same as today's entrepreneurs beginners, Columbus did not give up. He presented the idea to other possible investors in Italy, France, England, and again in Portugal. He was rejected every single time. He then tried his luck with Ferdinand and Isabella, the rulers of the re-united Spain. He found experienced lobbyists and with their help managed to persuade Queen Isabella to make an investment. As we all know, Izabela pulled a winning combination. Columbus' discoveries enabled Spain to conquer America, to open mines of gold and silver there, as well as plantations of sugar cane,

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tobacco, etc. The Spanish royal family, bankers and traders, became wealthy beyond their dreams...

17. CHOOSING THEIR OWN PATH – ARTISTS

Artists have always been the vanguards of creation; they chose their own destiny, not allowing the others to do that for them. More than anyone else, they were fleeing from a routine and had the courage to choose. Among artists there are some magnificent examples of creation. Unfortunately, some of them remain unknown, for example: the cave painter of Lascaux, or the author of the book of Job, or Homer (if he had ever existed), or the creator of the sublime statue of *Jayavarman VII*.

Some of the known artists were developing under the influences, but they managed to emancipate and create original works.

Antonio Vivaldi was studying music from his father, a violinist and composer, in the milieu of the small traders and entrepreneurs in Venice. Thus, he decided to devote himself to music. In his words, the music became his "absolute necessity"; he sought to ensure his future in music, and succeeded in doing so - he gained the position of master violin at the *Ospitale della Pieta*, and reached his dream. Vivaldi became one of the most important Baroque composers and the greatest violinists of his time.

Blaise Pascal at an early age refused tutoring by his father, who was interested in science and art. His father had planned to teach his son Latin and Greek, and then mathematics. Pascal avoided that and the assistance offered to him from others. He mastered mathematics as a self-taught, and became a famous French mathematician, philosopher and writer. Unlike Blaise, his sister, who admired Pierre Cornelle, was very talented for writing dramas for the theatre. But, under the pressure from her parents, she decided to devote herself to religion.

Wolfgang Amadeus Mozart did not independently decide to become a musician. His father, who was kapellmeister at the court of the Archbishop of Salzburg, was his first teacher. And he greatly influenced the

forming of Mozart as an artist. He organized Mozart's touring across Europe, starting with a concert in 1762 at the court of the Prince of Bavaria in Munich, and then at the Austrian imperial court in Vienna. The wonder of his talent led him to the imperial courts of Paris, London, Hague, and elsewhere. Mozart has learned from his father and the others, and his genius overcame all his teachers.

Gioachino Antonio Rossini also had a father musician, working in the orchestra, and a mother bar-singer. Barely twelve years old he had to work to help his family. Rossini early started learning about music, studying his almost contemporaries Haydn and Mozart. A composer with a rapid success, at the age of eighteen he wrote his first opera, the *Bill of Marriage*, which was performed in Venetian Teatro San Moise – he toured Europe and exercised influence with his style and opera genre. Rossini left music in the age of thirty-seven, dedicating himself to the pleasures of life.

Pablo Picasso, a son of an art professor, at the age of fifteen was admitted at the Royal Academy of San Fernando in Madrid. Although he developed under the influence of his father, he quickly transformed. When he was twenty-six (1907), he introduced his own vision of the world with *Les Demoiselles d'Avignon*. A critic wrote: *Picasso gave a new angle of representing reality ... to put eyes between legs... to displace ...*

Israel Isidore Baline was a Jewish-Russian immigrant under the name of Irving Berlin. He learned about the music from his father, a musician in the synagogue. After moving to the United States and the death of his father, Irving survived by working in bars. He early began to seek for a more respectable music, so he started to compose. At the age of twenty-three he wrote a piece that instantly became hit - *Alexander's Ragtime Band*. Since then, it was performed by the most famous musicians.

Maria Callas (Anna Maria Sofia Cecilia Kalogeropoulos) was born 1923 in New York City, Manhattan. She has been developing her voice under the strong influence of the mother. She was the second of two daughters in the family of Greek immigrants, George and Evangelia, who came to America shortly before her birth. The marriage of her parents was not happy, so in 1937 the mother decided to leave her husband and daughters, and return to Greece. Maria Kalas said that she felt ugly about her childhood, and that her mother forced her to sing. Sometimes she wondered if her mother had any feelings for her daughter when she could have been so cold. When Maria became popular worldwide, she often declared that her

mother was strict as Spartans, and without any sense of motherhood, and especially for art. Out of her misery, she emigrated to the United States, where she often moved, and repeatedly changed schools (five times). Maria discovered music when her mother bought a phonograph; later she explained that singing became like a remedy for her inferiority.

A great number of other artists have done something totally opposite - they have drawn strength from their family universes in order to create their life's journey, to become free, and some of them sacrificed their achievements.

Hildegard of Bingen, Caravaggio, and Giordano Bruno, they all fled from the fate predestined by their origin. Hildegard was the tenth child in a noble family Palatinate. She became a canonist, and then escaped from the life of Pope's advisors and emperor's advisor to become a musician of superior inspiration. Caravaggio was the son of a mason, but he became one of the greatest painters of all time. His models were ordinary people, the role models of values or crime. Caravaggio was persecuted for murder, and became the victim on an Italian beach. Giordano Bruno was a priest by vocation, an excellent writer, an inspirer of Shakespeare, and he was burned in Rome on February 17th 1600, because he argued that the Sun was just one of the galaxies in the universe.

Although Caravaggio became one of the greatest painters of all time, he had no artistic education – he was the son of a local builder, and began as a construction worker, preparing plaster for fresco painting. In 1588, he was learning art from Simon Petercana, little-known student of the famous Titian. In 1592, at the age of 21, Caravaggio moved to Rome.

However, Caravaggio was also a restless and adventurous spirit, as were the times in which he lived. He was not satisfied with his life, earning money in the richest and the brightest Roman salons. He was spending his nights in gloomy Roman taverns, in the company of gamblers, prostitutes, and scum. An established painter by day, he was in constant conflict with the law because of his night adventures. In 1600 (a year when Giordano Bruno was burned), Caravaggio was already known to the police and charged for various crimes. He experienced shipwreck on the journey from Naples to Rome. Few days later, he died of fever. The circumstances of his death remained unclear - it was recorded that Caravaggio died of malaria, and that aroused suspicion.

Denis Diderot was appointed to be a priest, but he refused it and became a great writer. He was an atheist, an enemy of the church, refusing all compromises. He became a prominent figure during the Enlightenment,

co-founder and chief editor of the world-famous *Encyclopedia*. Diderot was persistent and valuable - a remarkable organizer. He created numerous works and several volumes of philosophical and scientific books.

Friedrich Hölderlin was born in 1770 in a bourgeois family. In very early age he was traumatized by the death of his father as well as brothers and sisters. As a tutor in Frankfurt am Mein (1796-1798) he fell in love with Susette Gontar, the wife of his employer. She inspired him to write a novel *Hyperion*, his best work. In 1798, when his love for Susette was discovered by her husband, Hölderlin left Frankfurt and began his long wandering. In 1802 he returned to Germany and learned about Susette's death. Due to the great sorrow, he became mentally ill, and was sent to a clinic in Tubingen (1806). He died in 1843. Hölderlin family had never supported him. Hegel was his close friend.

Joseph-Ferdinand Cheval was born in 1836 in Drome. At the age of thirteen he worked as a baker, then as the agricultural worker, warehouseman, and eventually became a postman. For the next thirty-three years, Cheval picked up stones during his daily mail round and carried them home to build "Palais idéal". Inspired by the death of his wife and children, as well as his exotic dreams, it became the prototype of the "brutal art".

Cheval began to build in April 1879. He noted the following: *I was walking very fast when my foot caught on something that sent me stumbling a few meters away, and I wanted to know the cause. In a dream I had built a palace, a castle or caves, I cannot express it well...I told no one about it for fear of being ridiculed and I felt ridiculous myself. Then fifteen years later, when I had almost forgotten my dream, when I wasn't thinking of it at all, my foot reminded me of it. My foot tripped on a stone that almost made me fall. I wanted to know what it was... It was a stone of such a strange shape so I put it in my pocket to admire it at my ease. The next day, I went back to the same place. I found more stones, even more beautiful, I gathered them together on the spot and was overcome with delight... It's a sandstone shaped by water and hardened by the power of time. It becomes as hard as pebbles. It represents a sculpture so strange that it is impossible for man to imitate, it represents any kind of animal, any kind of caricature.*

...I said to myself. Since Nature is willing to do the sculpture, I will do the masonry and the architecture.

Vincente Van Gogh was born in 1853, in a family of Dutch traders. He discovered art when he worked in his uncle's art gallery for seven years.

Refusing to see art as a trade, he left Pays Bas to study design in London. Since he refused to be a pastor, he was in bad relations with his parents. At the age of thirty he begun to paint. He became one of the greatest post-impressionists, and one of the most respected artists ever. He painted one picture a day.

His works were notable for its rough beauty, emotional honesty, and bold colors, and thanks to that Van Gogh became one of the leading artists in the 20th century. After a long and painful problems with anxiety and frequent mental conditions, he died of gunshot wound at the age of 37. It is widely accepted that he committed suicide, although the gun from which the shots were fired was never found. During his life, his work was known to very few.

Van Gogh began to draw as a child, and continued for years before he decided to become an artist. Many of his most famous works were completed in the last two years of his life. For more than a decade, he has created more than 2,100 works, including 860 oil paintings and more than 1,300 watercolors, drawings, sketches and prints. His work includes self-portraits, landscapes, still lifes, and portraits, with usual motives of cypresses, wheat fields, and sunflowers. He wrote to his brother about one of his paintings: *The room is blood red and dark yellow with a green billiard table in the middle; there are four lemon-yellow lamps with a glow of orange and green. Everywhere there is a clash and contrast of the most alien reds and greens, in the figures of little sleeping hooligans, in the empty dreary room, in violet and blue... I have tried to express the terrible passions of humanity by means of red and green.*

Arthur Rimbaud spent his childhood with his mother in Charleville. She was repulsive and sharp woman, divorced from her husband who had a military career. Little Arthur discovered poetry during the school exercises. At sixteen, after numerous escapes to France and Belgium, he managed to become a journalist in Charleroi. At the age of seventeen, while living in Paris, he met famous french poets of that time: Paul Verlaine, Stéphane Mallarmé and François Coupé. He became one of them and wrote, among others, a verse-poem *The Drunken Boat*. At the age of twenty he left poetry for good.

Arthur Rimbaud was born into a middle-class provincial family in Charleville, in the northeastern France. When he was six years old, his father left the family, and his mother continued to educate her children. Artur grew up strongly influenced by her mother, a strict Catholic, who raised him in a religious spirit. Fearing of bad influences on her sons, Ms.

Rimbaud moved to the province of Orlean. She was teaching them until their ninth year of age, and then they were sent to a local school. Before enrolling at College de Charleville, Arthur was reading only the Bible, but he very much enjoyed fairy tales and stories about adventures. Arthur's tutor, whom his mother had hired in order to prepare her son for successful academic future, managed to wake up Arthur's interest in Greek, Latin and French classics. He was also encouraged to write original verses in French and Latin. The first Rimbaud's poem was *The Orphans' New Year's Gift (Les Etrennes des orphelines)*, published in the edition of the *Revue pour tous's* on the January 2nd 1897. Georges Izambard, who arrived in Charleville immediately after the publication of the poem, became Rimbaud's mentor in literature and his great role model. The first song he showed to Izambard was Ophelia, which would later become a part of anthology, and one of the Rimbaud's best songs. After the outbreak of the Franco-Prussian war and Izambard's departure, Rimbaud was despondent. He fled to Paris, where he was arrested and where he spent several weeks in prison. Thus, he decided to leave the art forever.

Henri Matisse discovered art in his twenties, when his mother - an amateur painter – gave him a box of paints. Later, despite the opposition of his father - a grain trader - Matisse left the law studies and enrolled himself at School of Fine Arts in Paris. In those years he made his first painting, *Still Life with Books*. At the age of twenty-seven he exhibited at the Salon des Cent.

Matisse was 22 when he came to Paris to study painting in Gustave Moreau's studio. Many young painters (Derain, Vlaminck, Braque, Dufy) were gathering there, forming later the movement of *Fauvism*. This generation primarily followed their instincts. The art was transformed from impressionist luminism to the pure colour. The ideas of young artists caused the resentment of critics and wider audience. However, that was the fate of all the innovators of French art.

Matisse acquired world-wide reputation in Germany and America, and especially in Russia. In his later works he was increasingly focused on still life, arranged flowers, and fruit... Matisse has continued the great tradition of French art in a new, modern version. Young French painters and foreigners flocked to Paris, the artistic Mecca. Matisse's thought had a great impact on European and world painting, and has remained until today as such.

Camille Claudel was born in 1864 into a bourgeois family de L'Aisne. In her youth she met sculptor Alfred Boucher who discovered her talent for sculpting. Despite the disapproval of her mother, Camille decided to become a sculptor. She went to Paris, where she met Auguste Rodin in 1882, and became his assistant, his muse, and one of his mistresses. Disappointed in him, and rejected by the public because of her way of representing women, Camille lapsed into paranoia. In 1913 she was admitted to a psychiatric clinic. She died thirty years later without the support of her father, a diplomat and a writer.

Camille was fascinated by the stone even as a child. As a young woman she studied at the Académie Colarossi. In 1882, she has opened a workshop together with other young women.

In early 1903 she exhibited at the parisian Salon des Artistes français, and Salon d'Automne. At the beginning of the 20th century, her original sculptural works have been a great success.

Charles Bukowski was born in 1920, and spent his childhood in the poor neighborhoods of Los Angeles, constantly being harassed by his father. At the age of ten, thanks to a literary section where he had read his esey, Charles decided to become a writer. After argument with his father he ran away from home. He worked as a laborer, warehouse clerk, and then as a writer. He became famous in his fifties.

Bukowski grew up in a time of economic depression that has gripped America between the two world wars. His strict and dominant father often remained out of work, venting his frustration usually on the boy, bullying him, which Bukowski will address in his novel *Ham on Rye*. Adolescent acne that left scars on his face made him feel like a loser and a weirdo. Trying to protect himself from the traumatic reality, Bukowski early turned to alcohol, but also to reading books. As a high school student he read a lot, especially the works of Ernest Hemingway, Sinclair Lewis, D. H. Lawrence. After high school he enrolled at City College in Los Angeles and attended courses in journalism and literature.

In 1941, he left college. After one of quarrels with his father, who threw his son's stuff out of the house after reading some of his stories, Charles left home. Not wanting to join the US Army, during the war years, Bukowski was living almost like a homeless, traveling through America and occasionally getting jobs to earn some money. In 1944 the magazine "Story" published his story. This prompted him to make a living solely out of writing, but he went completely unnoticed. Disappointed, he returned to Los Angeles, almost giving up on writing.

In the sixties, his career finally moved upward. Small "underground" magazines were regularly publishing his poems. Bukowski became famous in informal literary circles, thanks to his first public poetry readings. Since then, his career was on the rise.

Yukio Mishima was born in Tokyo in 1925. Raised by his grandmother, he began writing at the age of fifteen despite the disapproval of his father, who noticed the homosexual inclination of his son, and wanted him to become a finance minister at all costs. At the age of twenty-three, contrary to the wishes of his parents, Yukio announced that he wanted to commit fully to literature. A year later he published a novel *Confessions of a Mask* (*Confession d'un masque*), an autobiographical work dealing mostly with homosexuality, which made him famous. His early childhood was under the domination of his grandmother, who separated him from his family. Several years later Yukio returned to his family and began writing short stories. He was reading a lot, Japanese, European, and other authors, while studying German, French, and English language. Despite his authoritative father, who had forbidden him to write, Yukio continued doing it secretly, with the support and protection of his mother. Learning by day and writing by night, he graduated at Tokyo University in 1947, and got a position at the Ministry of Finance. Before him was a promising career. However, working day and night, Mishima was exhausted. Finally, his father agreed to withdraw Mishima from work and thus he dedicated himself to writing.

John Lennon, known as the leader of *The Beatles*, comes from a working class family. Bad mannered (by his aunt) and brawler, Lennon got the equivalent of a college degree. At the age of 16, with the support of his professor, he opted for beautiful art, where he vegetated without serious loss. And then he went to an Elvis Presley concert. He began imitating Elvis, and soon he was in a rock'n'roll band. After that, nothing else mattered to him.

Jean Michel Basquiat was born in 1960 in Brooklyn, of Haitian father and Puerto Rican mother. At his early age he was drawn to design, influenced by visits to the Museum of Modern Art in New York. At seventeen, he decorated the entire Manhattan wall with graffiti under the pseudonym Samo. Basquiat died at the age of twenty-seven. His fame culminated posthumously, mainly in the exterior design and collages.

Damien Hirst was born in 1965 in England, and nothing has predestined that he would become a famous contemporary artist. A son of a mechanic and a secretary, he grew up in Leeds, and was mostly interested in design. After being repulsed by the Leeds College of Art, he worked for two years as a construction worker in London, then studied at Goldsmiths College of Art. With the support of an art collector, Charles Saatchi, Damien soon became a leader of the Young British Artists.

Mirko Kovac was born in Petrovici, Montenegro, in 1938. He grew up in the midst of poverty and unsettled family life (often absent father and scattered siblings). Soon he fled to Belgrade, where he changed several places of education due to the conflicts with his teachers. As it happened, he studied the Academy for Theater and Film in Belgrade – but he has never graduated because of his novel *Scaffold* (1962), which was declared as ideologically unsuitable. A novel caused political and ideological condemnation due to *the black image of the world*. Kovac has created a remarkable literary works, although he spent his whole life "on the border" of more disputed than praised. Since 1991 he lived in Rovinj, Croatia, where he died on August 19th 2013.

Danilo Kis was born in Subotica in 1935, a son of father Edward Kis, a Hungarian Jew, and mother Milica Dragicevic, a Montenegrin. Until 1942, he lived with her parents in Novi Sad, and since 1944 in Cetinje. In 1954, Kis enrolled at the Faculty of Philosophy in Belgrade. In September 1958, he was the first student to graduate on the Department of General Literature. His early works were published in 1953. Kis spent childhood and youth in poverty and with much difficulties - his father died when Kis was two years old, and his mother died when he was twenty. His life was dedicated to creating unsurpassed work.

At the age of fifteen, Kish decided to become a poet. He was preparing for that call, translating poetry from French, Hungarian, and Russian. However, he turned to prose and very young began to write. He was 25 years old when he wrote his first novel, *Psalm 44*, published in 1955; it was followed by a novel *the Attic*, 1960. Those and other literary works put him in the ranks with the greatest European writers.

Madonna Louise Ciccone was born on August 16th 1958, in Bay City. Her father Sylvio was an American-Italian, and mother Madonna of Canadian origin. She grew up in Pontiac, Michigan. Many think that her name Madonna was her stage name, but she was named after her mother. At the age of 8, during the rite of confirmation, she added name Veronica, after

the woman who, according to the Bible, wiped the face of Jesus on the road to Calvary.

When she was five years old, her mother died of cancer. That was a big blow for her and the sadness over the loss of her mother, and the importance of family relationships, is often interpreted in her work. Her father soon remarried their housekeeper, which Madonna has never fully accepted. She grew up in a strict Catholic environment, and often went to a church. She was a bit of a freak at her school, but she was an excellent student and a regular at piano lessons. After a while she got bored with it, and convinced her father to pay for her dance lessons.

There she met Christopher Flynn, her dance professor, whom she considered the most influential figure in her life. Despite the fact that she received a scholarship at the University of Michigan, she rejected it and went to New York to find a job. She had only \$35 in her pocket. At first she worked as a waitress in Dunkin' Donuts, until she became one of the dancers on the Patrick Hernandez world tour. Later she founded a band Breakfast Club with Dan Gilroy, where she expressed her vocal abilities. When the band broke up, Madonna went to Mark Kamins, a popular New York DJ, who was impressed with their demo recordings. He helped Madonna to score a record deal with Sire Records.

In 1983, Madonna released her debut album, and shortly afterwards the single *Holiday* peaked at number one on the Hot Dance Club Play. The following year, the album *Like a Virgin* was another success, which was the number one on the Top Charts in many countries. The iconic album *Madonna*, that followed, was accompanied by one of the previously unseen marketing strategies, including the fashion footwear and accessories. The album *Virgin* was still at the peak of popularity when Madonna radically changed her image for the next album *True Blue*. And those changes have become her trademark in the following decades. Today, Madonna draws attention with her ability to transform, as well as the fact that she managed to get back into the business after a few commercial failures. Madonna is one of the performers with the most various styles of hair, clothes, behavior, songs, and videos. She is "the true leader of changes."

18. FOSTERING INNOVATION AND CREATIVITY – *STAY HUNGRY, STAY FOOLISH*

Behavior and norms are induced by the environment-shape behavior, attitudes, and mindset of a population. Most people are inert, they do not observe reality, nor the critical environment, accepting the world of others, closing in themselves, not wanting to change anything in their lives. It is assumed that the only important thing is what the majority finds important. In such a world, our time irrevocably passes, and our beings and our souls suffer under the shackles of superficial. Superficiality occurs in relationships with people, in the ways they communicate, in our ordinary thoughts, and in the explanations of the phenomena!

The great problem of modern population is the lack of action, initiative, dynamics, and movement. There is a lack of creation! The absence of creativity destroys the human soul, because it is subdued to unfulfillment. Therefore, it is crucial to discover a new reality that exists somewhere outside the reality which is enforced on us. It is necessary to overcome the constraints that hinder our action. We must use the time productively to direct our energy thoughts and actions on the results that will assess the wider market - not local, but global. Our ambition needs to demonstrate the values outside the local market, where final solution, determinism, and mechanicism don't exist!

Creative thinking has given many solutions that have raised the world to the present level. I hope that I have set the grounds for sowing and nurturing of your creative thinking. Also, don't forget that we, the people, are the innovative species! Slow and weak human beings did not just survive in a favorable environment. They thrived thanks to their innovative nature. Changes, innovation, and creativity are the human qualities that have marked the history, because they drive people toward progress.

Innovation begins in early childhood. Our innovative talent eventually fades because we gradually fit into the established way of thinking. This is affected, above all, by education, socialization, and working routine. Through these negative impacts we lose our identity and become a part of the crowd. After school, we continue to follow the planned route, we continue going with the flow. In fact, society teaches us to adopt rules, to use them, and respect deeply. That is an easier way, because we behave according to the common system of values, as it has been expected from us.

Creativity is related to the new ideas, which arises only when we abandon the usual mindset. If you want to be creative, you have to break some rules. The best example is Albert Einstein. He was free in seeking the grand solutions. No one could manage his inordinate ideas. But it is never easy to think in a new way!

Established opinions and patterns strongly influence our mindset. For example, the most modern trains run the standard tracks, which were adopted many years earlier. This standard has been established in the UK, at a time when the tools for making the wheels were used for building the shaft of precise width. All coaches were using these dimensions to match the width of British roads, which were created after the former Roman routes. Roman chariots had shaped these roads, creating wheel-ruts. Roman chariots were built as it was convenient for a horse-drawn vehicle. Modern transport system does not deviate from what has once suited the carriages in Roman times. Essentially, the same is with our thoughts. They are formed by the old school of thought, which had been developed for generations.

A precondition for creativity is the change of a mindset, which means breaking the established rules. This also means abandoning the existing in order to develop the new.

New organizational forms must have the ability to change constantly. An organization needs to be capable to systematically abandon everything that has been firmly and commonly established, whether it is about products, services or processes, human and social relationships, skills, or organizations themselves. Schumpeter calls this kind of organization a creative destruction. Each such organization must incorporate the management changes into its very structure. This chapter will present some impressive examples of gigantic creativity and innovation.

Bill Gates is the creator of Microsoft, a world giant in information technology. Gates expresses the mission and values of the Microsoft as follows: *Our Mission: At Microsoft, our mission and values are to help people and businesses through the world until they realize their full potential...*

Our Values: As a company, and as individuals, we value integrity, honesty, openness, personal excellence, constructive self-criticism, continual self-improvement, and mutual respect. We are committed to our customers and partners and have a passion for technology. We take on big challenges, and pride ourselves on seeing them through. We hold ourselves accountable to our customers, shareholders, partners, and employees, by honoring our commitments, providing results, and striving for the highest quality.

Those ideas and vision that Microsoft has today started in 1975 with an idea: *A computer on every desk and in every home!* The old mission of Microsoft company (albeit slightly wider) was as follows: *A computer on every desk and in every home, all running Microsoft software.* The initial idea, a dream, covered in this sentence, surely seemed unachievable. However, a clear idea of setting all the elements to turn it into action, has led Microsoft from a small provincial company to the world's giants in the information technology and business.

Louis Gerstner was fascinated by the idea of working for the benefit of customers, so he *viewed the technology through the customer's eyes.* In 1993, this idea has enabled the successful return of IBM on the market. Same year, Gerstner has been appointed a CEO of IBM and he immediately put customers in the first plan. He said: *We start with the customer's business problem, and work back to the right combination of technology and expertise.* He clearly formulated why he become a CEO of IBM. This leads us to think what we want to do and for whom. What is useful for our customers that we can provide to them? Louis Gerstner realized that IBM has forgotten that the customer is in the foreground, and reminded them what is at the core of IBM. *Who says that elephants can't dance?* - is the title of his book, in which Gerstner promotes his ideas - *My people do not work for me, but for the customers.*

Alfred Sloan (1875-1966) was Chief Executive Officer from 1923 to 1946, and Chairman of the Supervisory Board of General Motors (GM) from 1937 to 1956. During these thirty-three years under his leadership, GM has experienced enormous expansion with the continuous growth of market share. From that we can learn that effective decisions are not made quickly –

it is necessary to overcome the conflict of opinions in order to reach a consensus. We need different views on the problem, different assessment of the situation, and intense dialogues. All this provides the basis for better options, and for making the correct and effective decisions. Strategic decisions in GM were preceded by usually big debate. And as being described in one of the cases, the proposal was so well-reasoned that it was immediately accepted by all. It was assumed that Sloan would also support it, but he said: *Gentlemen, I take it we are all in complete agreement on the decision here*, he started, and everyone nodded their heads in agreement. *Then, he went on, I propose we postpone further discussion of this matter until the next meeting to give ourselves some time to develop disagreement, and perhaps gain some understanding of what the decision is all about.* Sloan teaches us that in the decision we reserve the following steps:

- Identifying and defining the problem,
- Determining the request which the decisions should fill,
- Determining what is right,
- Elaboration of the alternative proposal and discussion about it,
- Decision-making with a concrete plan of implementation,
- Collecting data from the results and system control of implementation.

Phil Knight, a co-founder of Nike Inc., has turned an insignificant item into a high-tech product, and his small business into the leading company on the market. No one revolutionized sports marketing in the last forty years as Phil Knight. Just a few managed to significantly mark the world of sport. One cannot overlook the fact that Knight had a key impact on the creation of a completely new lifestyle industry, and he did all that starting from an ordinary sneaker. Better than anyone else, Knight understood and interpreted the market, his existing and potential customers, then the possibilities of technology, development of his own and other industries, changes in the world economy and society in general.

List of the things he did is distinctive from the others. Knight used new materials, efficient production processes, and radically different marketing designs. Thus, for example, before the sneakers became a fashion item, he had the idea to tie *Nike* brand to famous sports personalities. The greatest success in the eighties of the 20th century undoubtedly was his cooperation with Michael Jordan, a great basketball star of the time. He named *Air Jordan* sneakers after him and those were a phenomenal sales hit.

When the growth of the Nike Inc, due to popularity of basketball in the United States, and the general interest in jogging, started to decline at the beginning of the nineties, Phil Knight recognized newly identified trends, and knew how to set the appropriate strategy. His company continued to invest in its products, but in marketing purposes Knight hired new sports stars such as Tiger Woods, Andre Agassi, and Roger Federer.

The key lesson about *Nike* sneakers is that trends evolve, and therefore the strategies must evolve, too. Equally important is that even the best strategies are not worthy if they are not put into practice. *Just do it!* That simply needs action. Strategy is dead until it clarifies exactly what to do, and when. Long time ago, Saint Augustine (354-430 BC) said: *We pray for a miracle, but we work for success.* Similarly, only a little bit more pragmatically has been formulated by Herbert Kelleher, founder of the Southwest Airlines: *"We have a strategic plan! It's called doing things!"*

Michael Dell, a founder and CEO of Dell Computer Corporation, has revolutionized the computer industry. He had only one goal: to create a benefit for the user. At the age of twelve, Michael Dell organized the trade of postal stamps and issued his first catalogue named Dell's Stamps. He early learned to appreciate the direct contact with customers. At sixteen he began direct marketing campaign, selling subscriptions for newspapers to the people who had just moved to the place where he lived. It was quite a lucrative business in which he earned \$18,000 on premiums. At nineteen he founded a computer Dell Computer Corporation which has had an incredibly rapid growth. After only four years, the corporation has appeared on the stock exchange. Several years later, at the age of twenty-seven, Michael Dell became the youngest chairman of the board. His company was listed on the Fortune 500 top companies. Dell Computer Corporation has had the best solutions for the organizational structure related to the strategy. That has enlisted:

- Focusing on a product that customer pays;
- Employees performing what they are paid for;
- Management performing what they are paid for.

Warren Edward Buffett (30. 8. 1930) is an American businessman, CEO of Berkshire Hathaway insurance company, where he holds over 38% shares. According to the Forbes List, Buffett is worth \$62 billion. He is one of the richest people in the world, and the most influential in the United States. His opinions on financial matters have a great reputation. Buffet is also known for his humble lifestyle, and the attitude that inheritance should

be limited, because it discourages economic growth and stifles entrepreneurship.

Warren Buffett is a man who has realized the numerous benefits of efficiency. In making his investment decisions he always paid special attention to the quality of management in a given organization. He positively assessed the management, for example, when purchasing a larger number of McDonald's shares, or when taking over the company GEICO (one of the largest car insurance companies in the United States), or in cases of Coca-Cola, American Express, Gillette, and Net Jet. He often talks about the quality of management and their results in given companies. He supports them to act and think in a way as if they were the owners of those organizations. The annual report of Berkshire Hathaway for 2008 stated that Buffet and his partner **Charlie Munger** delegated so many deals that one could almost assume that the two of them abdicated. Although Berkshire employs around 246,000 workers, the management consist of only twelve people. Thus, it is no wonder that Buffett is involved in only two areas: 1) allocation of capital and, 2) paying attention to his key managers and intensive communication with them.

The most striking example of his consistent orientation towards quality managers Buffett showed in the spring of 2006, when he announced giving away a large part of his wealth as a contribution to the Bill and Milinda Gates Foundation: about thirty billion dollars. In an interview for the Fortune magazine, he answered the question: Does it occur to you that it's somewhat ironic for the second-richest man in the world to be giving untold billions to the richest man? *When you put it that way, it sounds pretty funny. But in truth, I'm giving it through him – and, importantly, through Melinda as well – not to him.*

By handing over his property to one of the most successful people of our time, Buffett wanted to achieve the best result possible.

Klaus Schwab is a man who has dedicated his life to improving the progress of mankind. Only few people can systematically, consistently and, above all, successfully fulfill such a high goal. His engagement is an example of opportunities which emerge when unifying the power of the best. This is something that each of us needs to implement in life.

Klaus Schwab is a founder of the World Economic Forum. He gained respect among the professional audience during the seventies of the last century, when he had organized conferences in Davos. As a young

economics professor, he asked his secretary to phone Giscard d'Estaing. He was referring to Olivier Giscard D'Estaing, the vice-president of the renowned business school INSEAD. Once the connection was established, Schwab heard a deep voice on the other side - and he instantly knew that it was not Olivier Giscard d'Estaing but his brother Valery Giscard d'Estaing, the French president at the time! *I was so scared that I hung up*, Schwab later admitted. His secretary had inadvertently called the Elysee Palace, and indeed she made a direct connection with the president of France ... For Schwab, that was the moment to consider larger engagements. Today, forty years later, Schwab is able to collect the creative power of the best people in the world. Forbes magazine rated him as the most powerful man in the world, and in 2009 Schwab was ranked 66th. Exchanging opinions of experts from various fields and their networking is the approach that has been varified at the World Economic Forum, particularly in a time of great challenge and change.

Coco Chanel (1883-1971) lost her mother when she was 12 years old. As her father didn't want to take her in his custody, she grew up in an orphanage and decided to be financially independent. At the age of twenty-seven, she opened her first fashion salon in the Cambon street, Paris, near the famous Place Vandôme. In 1910, Coco was selling hats she designed. As they were very well accepted in the high society of Paris, she soon expanded her fashion collection. Until 1916 Coco opened new boutiques and employed about 300 people. In the year 1920 she promoted her legendary perfume Chanel No 5. The same year, the tax on her income amounted to ten million francs. By the end of the twenties her company had more than three thousand employees. She introduced a number of innovations in women's fashion serving as an example of an innovative business. Great attention to details, and good sense for the customer needs, opened the chances of her success. Coco Chanel offered what has been beneficial for her customers.

Coco has always hired outstanding personalities as leaders in her company. She was known as a perfectionist. Her guidance in business was financial independence. She also felt that the coincidence had a major share in her success. Once, almost too modestly she said of her career: *What did I know back than about my profession? Nothing. Was I aware of the revolution I would start? Not in the least. One world was dying and another had to be born. I merely happened to be there, when an opportunity came my way, which I duly seized. I was as old as the century. Somehow it became my destiny to develop a new style of attire. Women wanted*

Fostering innovation and creativity – stay hungry, stay foolish.

simplicity, comfort, and clarity. I had always made those things my priority, without having an agenda. True success stories always contain an element of chance. Ups and downs go together. But Chanel lasts: the world stars today wear Chanel.

James Wilson (1805-1860), was the founder of *The Economist* magazine, established in 1843. Wilson, a hat-maker from the small Scottish town of Hawick, believed in free trade, internationalism and minimum interference by government, especially in the affairs of the market. The magazine was published in order to participate in *a severe contest between intelligence, which presses forward, and an unworthy, timid ignorance obstructing our progress*. The protectionist Corn Laws, which by taxing and restricting imports of corn made bread expensive and starvation common, were bad for Britain. Free trade, in Wilson's view, was good for everyone. Although the Corn Laws were abolished in 1846, the *Economist* magazine resumed publication, pledging to support the liberal ideals of its founder. Today, without exaggeration we could say that *The Economist* is a mandatory literature for economists and business people worldwide. For many, this magazine is a source of information for better understanding the economics, business, and finance.

One of the editors once described *The Economist* as: *a Friday newspaper, where the readers, with higher than average incomes, better than average minds but with less than average time, can test their opinions against ours. We try to tell the world about the world, to persuade the expert and to reach the amateur, with an injection of opinion and argument.*

Andrew Stephen (Andy) Grove is a Hungarian immigrant who built Intel with fierce competitive drive. He was born in Budapest (1936) and had a difficult childhood. As a descendant of Jewish merchants he had to hide from fascists under a false identity and with the help of his friends. In 1957, he decided to flee to the United States, since the military intervention of the Soviet Union smashed the Hungarian popular uprising in October 1956. In America, he changed his name (András István Gróf) into Andrew Stephen Grove. Diligent and without help, he learned English and enrolled at the University of Berkeley, where he received his doctorate in 1963. After graduation he got a job at Fairchild Semiconductor, where he met Gordon Moore and Bob Noyce. Together, they established Intel in 1968.

The three of them were an outstanding team. Grove had twenty-seven, and Moore and Noyce have already been in their late thirties. This

trio is one of many examples, showing that it's never too early to team up with the best. Before Fairchild Semiconductor, Noyce and Moore had worked for Shockley William, who won the Nobel Prize in Physics (1956) for the discovery of the transistor effect, and who issued the first guidance for semiconductor electronics. In 1975, Moore formulated the thesis which later became known as Moore's Law: the number of transistors on a computer chip doubles every 18 months, which turned out to be surprisingly accurate, pointing to Moore's extraordinary ability to foresee developments in this field. Grove did not introduce into the team only his professional skills, but also a healthy human reason, which was necessary to establish a link between scientific development and reality, and to ensure its practical application. His pragmatic approach was clearly reflected in one of his statements: *There is one rule in my company: To predict what will happen in the next ten years, it is necessary to look at what has happened in the last ten years.* Grove has built a large corporation Intel, and never surrendered to complacency. It is interesting and instructive how he has overcome major crises. One of the biggest was when the Japanese manufactured memory chips that were much better than the Intel's. He made a difficult decision to stop manufacturing memory chips and start making microprocessors, to enter the market which had yet to be developed. Next big crisis Andy Grove weathered with Intel in 1994. The company had just launched the latest generation of microprocessors, the Intel Pentium processor, when the Grove received information that IBM would terminate delivery of all computers with embedded processors. The reason was "a small design error", which was immediately corrected. However, a small design error has jeopardized the survival of the entire corporation. Intel has decided to withdraw all delivered microchips, which costed them half a million dollars. But Grove managed to regain the customers trust. He implemented strategic changes in the shortest possible time. Those changes are described in the literature as a creative destruction. A large part of his book *Only the Paranoid Survive* is dedicated to such changes. Peter Drucker praised this book (which is rare) saying: *"This fantastic book is dangerous ... It'll make people think."*

James Watt (1766-1819) is well known as the inventor of the steam engine, but that is untrue. English blacksmith Thomas Newcomen has developed the first steam engine in 1712 for pumping the water out of English coal mines. Unfortunately, the machine was extremely ineffective. James Watt has improved it to perfection in 1764. He even learned foreign languages to study literature on similar machines made in other countries. It was his way to gain the precious knowledge which was scarce at the time. In

1776, he put his machine into operation. Pretty soon the steam engine has revolutionized transport. It was often used as a drive for ships and steam cars, and later it was redesigned in order to create a locomotive.

Steve Jobs (1955-2011) has changed our world, our habits, our demands. He was a pioneer who stood shoulder to shoulder with brilliant minds: Thomas Edison, Henry Ford, Walt Disney, Albert Einstein and others. He considered himself a revolutionary, fighting against large corporations, even though he was the CEO of a large corporation. Steve Jobs was an introverted person and he has almost never talked about his personal life. However, when promoting a new product of his company, he was making a fantastic spectacle of it. In fact he was unsurpassed.

But the presentation of new products was not the only spectacular thing he did. Steve Jobs was able to impress mostly young people with his lectures. In the summer of 2005, Jobs gave his legendary speech at Stanford University. He told the students that as a young man he had read the following quotation: *If you live each day as if it was your last, someday you'll be right.* Jobs continued asking himself whether he was doing what he really wanted for the rest of his life - and if the answer was "no", he would change his plan. *Your time is limited, so don't waste it living someone else's life. Don't be trapped by dogma – which is living with the results of other people's thinking. Don't let the noise of other's opinions drown your own inner voice. And most important, have the courage to follow your heart and intuition. They somehow already know what your truly want to become. Everything else is secondary,* he advised the students. Jobs ended his speech with the declaration that marked his life: *Stay hungry, stay foolish!*

Steve Jobs is a unique example of innovation. He first had the ideas, which he implemented into action: Apple 1, Apple 2, Apple Macintosh, Toy Story, iMac, iPod, iTunes and iPhone...

Gustav Eiffel (1832-1923) was a French civil engineer and architect, known for constructing bridges, halls, and exhibition spaces of steel, but the idea of building a tower made him famous. Maurice Koechlin made the first drafts in 1884, and Eiffel's company won the competition in 1886 won to build the tower for the upcoming World Exposition in 1889. Two years later, under the Koechlin's leadership, at the Champ de Mars was built probably the most famous symbol of Paris. Gustav Eiffel enthusiastically said, *The French flag is the only one with 300 meter pole.*

The Eiffel Tower, however, would have never been built if the prominent citizens of Paris were asked. Famous artists: Charles Gounod, Émile Zola, Leconte de Lisle, Guy de Maupassant, Alexandre Dumas, and Charles Garnier, have compiled the following letter: *We writers, painters, sculptors, architects, and passionate devotees of the hitherto untouched beauty of Paris, protest with all our strength, with all our indignation in the name of slighted French taste, against the erection of this useless and monstrous Eiffel Tower...*

When the tower was built, these same artists began to admire it. The tower appeared in many art pictures, songs, novels, etc.

Jeff Bezos has founded *Amazon.com* in 1994 with the idea to create a space on World Wide Web, offering the convenience of monitoring and buying books among more than a million titles. The concept was well received. In the first month, the company has been active in fifty US states, and forty-five countries around the world. However, the profitable era begun nine years after the foundation, in 2003. From a small start-up company operating in the garage near Seattle, Jeff Bezos managed to establish one of the leading e-commerce platforms.

The rise of the Amazon was marked by the relentless efforts to introduce innovations, always with an aim to offer a greater benefit for customers. Innovations have been expanding: trade media products, global approach, creating on-line market for external traders, as well as web services which allow the third parties to use the Amazon Infrastructure are just some of the examples.

Larry Page (1973), a co-founder and a CEO of Google, together with his partner Sergey Brin, has impressively demonstrated the enormous power that lies in the timely identification and the use of new technologies. The Google company dominates the Internet search market, as well as the online advertising market. Without Google, the Internet would not have been conceivable, and without Larry Page, Google would not have been what it is.

Larry Page has explained for the Fortune magazine which is the best advice he ever got: *For my dissertation at the Stanford University I had in mind a dozen topics. One of them was to examine options for connecting to the Internet. My professor Therry Wineyard chose this topic and said: "Well, it looks like a really good idea." I will never forget this.*

With his fellow student Sergey Brin, and with Wineyard's initial support, Larry Page has developed a *project Google*, which in 1998 developed into a company. After its establishment, he was appointed at the

position of Executive Director, where he remained until 2001. Under his leadership the company has grown, having two hundred employees, and crossing the limit of viability. In 2001, the founders of the Google appointed Eric Schmidt as an executive chairman. Larry Page remained a key figure in managing the company. He also received numerous awards, among others the Swedish Economic Forum named him a *manager of the global future* (2002). In 2011, Forbes estimated his wealth at sixteen billion dollars, which ranked him the 26th at the world's list of billionaires.

Giuseppe Verdi (1813-1901) is an example of how to achieve something in life with joy. He proved that man should devote all his heart to one goal. From Verdi we can learn to set ourselves the highest demands, and never cease to strive for perfection. Verdi was born in a modest family, but he was lucky enough to have Antonie Barezzi as his patron. Barezzi enabled him musical education, first in his hometown of Le Roncole, and later in Milan (1812). In 1839, Verdi began his career as an opera composer. Only three years later his opera *Nabucco* was a great success. With great enthusiasm Verdi writes twelve operas in 1850. His masterpiece *Rigoletto* (1851) marks the culmination of his famous creative career. Its triumphant premiere was in Italy, and it was also performed in other countries. Despite great success, Verdi continued to improve, because he wanted to make a perfect opera. Thus led to his famous works: *Il Trovatore* (1853), *La Traviata* (1853), *Don Carlos* (1867), *Aida* (1871)... At the age of seventy-four Verdi composed a masterpiece *Othello*. That was a time when a life span of healthy men was around sixty years. Although his life's work seemed more than completed, at the age of eighty, Verdi composed his last opera - *Falstaff* (1893). He was full of joy and vitality.

Thomas Mann (1875-1955) is one of the most important writers in the world, acclaimed by the critics with the Nobel Prize. He is interesting for us because as a good example of discipline in the process of creation. Mann has had the everyday working routine with systematic nature and outcome that confused even the most disciplined people: every morning he would write from nine o'clock until noon, one page per day; on better days one page and a half! He worked everywhere, no matter where he was. In 1939, when England and France declared war on Germany, Mann was traveling through Sweden and then he recorded in his diary: I wrote my page, as usual, aware of the events. In 1931, when he moved from Princeton to California, the moving company was emptying Mann's old apartment, while

The lay of creation

he was – as usual – writing a page of his novel. In one year he would write up to four hundred pages, and in three years he created his first novel *Buddenbrooks: The Decline of a Family*.

Systematic approach to the creation is very important: it took seven years for Michelangelo to create the *Last Judgement*, nineteen meter high fresco above the altar in the Sistine Chapel; Menzel spent several weeks from dawn to dusk in a factory in order to make a sketch of his masterpiece the *Iron Foundry*; Beethoven left more than five thousand pages of sheet music, which testifies to the remarkable way how meticulously he has been working on every piece!

Tomas Mann teaches us to write down our ideas and thoughts. He has not left any though unrecorded! The idea for his novel about the artist - Doctor Faustus - was born in 1901, when his friend told him the life story of a composer Adrian Leverkühn. Mann decided to transfer the legend of Faust into an masterpiece. Forty years later Thomas Mann went back to this idea. The novel was published in 1947.

Clearly, there is no creation without passion. Even brilliant minds cannot create without it. Regarding this, Schiller wrote to Goethe: *If only those who make judgments lightly, and other frivolous dilettantes, could know how difficult it is to create a decent work!*

19. PRACTICING LEADS TO NEW IDEAS AND ART OF CREATION

Repetition is a mother of learning (Russian proverb); *It is by forging that one becomes a blacksmith* (French proverb). Johan Wolfgang von Goethe argued that progress comes only through regular practicing. Roman historian Cornelius Tacitus believed that the exercise may even lead to art creation. Such examples are numerous.

Athletes, surgeons, pilots, soldiers, they all need to practice if they want to do their jobs well. Musicians, like Horowitz, practice the tone scales with deepest passions. Polish pianist Mieczyslaw Horszowski was ninety-eight years old when he recorded works by Bach, Schumann, and Chopin. That was possible only because he never ceased to exercise.

A stunning success requires, above all, a tireless practicing. Among the musicians are often heard a wonderful motto: Practice until you feel life in your fingers. **Vladimir Horowitz** (1903-1989) was one of the most important musicians of the 20th century and one of the most famous musicians as of today. His virtuosity was a result of continuous exercise. It was a prerequisite for his bravurous technique, perfection, and energy. Very few musicians (in recent history) managed to reach that level!

Therefore, we must train many disciplines in order to become more efficient and successful. Some activities may seem trivial at first, but practicing scales, in the intellectual sense, is also particularly demanding task. Knowledge without skill is always counterproductive. It is the ground on which we build skills, but it can not replace an art creation. Speed, accuracy, and consistency in work could be achieved only by constant performing. What we admire in masters is the ease they perform their tasks with. But the ease is just an illusion! It needs to be achieved! It is the perfectionism of professionalism and development.

There Is No Overnight Success

The first stage on the path to independence is awareness of its alienation. Also awareness of the inherent limitations of human existence: apart from a belief in eternal life or the Resurrection, everyone must take into account the uncertainty, and the limitations of his time on Earth. Useful exercise to understand life and its limitations is a picturesque imagination of every minute as a grain of sand in the hourglass. The pile of sand at the bottom is a life that has passed; every grain of sand may be associated with an event that has happened in our lives.

However, for the future events it is impossible to determine the specific grains of sand - we are able to see only the fallen ones. Each new grain of sand, every moment in life, may be the last. The narrow neck of hourglass through which the grains of life seep down is opaque.

This clearly reminds us that humans do not choose the date or place of the birth, nor the origin. That is not luck, nor a curse. That is reality, and the restriction on freedom.

Seeking to change the thinking and understanding of life, we need to ask yourself a few serious questions: Are we addicted to food? Or drinks? Or some drugs? Or ideology? Or power: economic, political or religious? How have we lived thus far? Are we free to choose our criteria of success? Place of residence? Place of study? Our current emotional partner? Our profession? Do we really search for our values and talents? What have we done wrong? What have we done well? What joy have we brought to others? Are we really materially limited or by our laziness? Are we affected by a tragedy? Can we overcome that? Or are we the source of it? Are we limited by the importance of the happiness to others? Do we condemn mediocrity? Do we want a life that resembles most other lives? Are we disappointed? Are we happy with our existence? Is what we are today in line with our projection of life?

It is comforting, but it is also the warning: most people, almost all, never answer to these questions honestly!

After evaluating the alienation and the insecurity of life, and after understanding where it leads us, one of the paths is to become aware of our body and soul - to appreciate ourselves, and to gain the respect from others. Once we achieve self-respect, we should nurture it, which means to fight all

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kinds of addictions. Consequently, it is necessary to play sports, to take care of our appearance, and to preserve physical and mental health.

Practicing the Creation of Ideas and Inhaling the Energy of Ideas:

Human life is different from the life of other animals. We human beings have a conception of ourselves and of our past and future. We reflect and assess. We form pictures of what should be a good life - often, it is true, only on a small scale, but occasionally also on a large scale. And we try to realize these pictures. This is what we mean by a distinctively human existence...

(James Griffin)



Life is an opportunity – benefit from it.

Life is a beauty - admire it.

Life is a bliss – taste it.

Life is a dream – realize it.

Life is a challenge – meet it.

Life is a duty – complete it.

Life is a promise – fulfill it.

Life is a sorrow - overcome it.

Life is a struggle - accept it.

Life is a tragedy – confront it.

Life is an adventure – dare it.

Life is luck – make it.

Life is too precious - do not destroy it.

Life is life – fight for it.

(Mother Theresa)



The most important human endeavor is the striving for morality of our actions. Our inner balance and even our existence depend on it. Only morality in our actions can give beauty and dignity to life...

(Albert Einstein)



Change your values and your life will change.

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I believe that life is like a river, and that most of the people jump in the river of life without ever really deciding where they want to end up. So, in a short period of time, they get caught up in the current: current events, current fears, current challenges. When they come to the forks in the river, they don't consciously decide where they want to go, or which is the right direction for them. They merely "go with the flow." They become a part of the mass of people who are directed by the environment instead of by their own values. As a result, they feel out of control. They remain in this unconscious state until they one day the sound of the raging water awakens them, and they discover that they're five feet from Niagara Falls in a boat with no oars. At this point, they say, "Oh, shoot!" But by then it's too late. They are going to take a fall. Sometimes it's an emotional fall. Sometimes it's a financial fall. It's likely that whatever challenges you have in your life currently they could have been avoided by some better decisions upstream.

(Anthony Robbins)



And in a thousands years' time, people will still be sighing: "Life is hard!" - and at the same time they'll be just as afraid of death, and unwilling to meet it, as we are.

The second part of life consists of liberation from superstitions and prejudices and erroneous opinions gained during the first part of life.

Life will be the same not only in two hundred years, but in a million years. Life doesn't change. It remains the same. It conforms to its own laws, and those laws don't concern us. We can't know them anyway. Migrant birds, cranes for instance, must fly. Whatever sublime or insignificant thoughts cranes may have – they fly, they fly on, migrate. Cranes don't know why or where they're flying. They fly, and they will fly. If there are philosopher cranes, they can philosophize – as long as they fly.

When you don't have a real life, you must live your mirages.

(Anton Pavlovich Chekhov)



I think people believe in heaven because they don't like the idea of dying.

(Baruch Spinoza)



Do you love life? Then do not squander time, for that's the stuff life is made of.

(Benjamin Franklin)



This is the true joy in life, the being used for a purpose recognized by yourself as a maghty one; the being a force of Nature instead of a feverish selfish little clod of ailments and grievances complaining that the world will not devote itself to making you happy.

Life levels all men, and death reveals the eminent.

Life is a flame that is always burning itself out, but it catches fire again every time a child is born.

(Bernard Shaw)



He who seeks the meaning of his life in spiritual training, can not be dissatisfied, because what he wants is always in his power.

(Blaise Pascal)



Life is but a drop of dew on a blade of grass.

(Budha)



Life, so-called the short episode between two great mysteries, which yet are one.

(Carl Jung)



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Life is made of little things. It is very rarely that an occasion is offered for doing a great deal at once. True greatness consists in being great in little things.

(Charles Simmons)



The world is a stage, a life is a performance; you come, you see, you go away.

The best thing for man is to pass his life so as to have as much joy and as little trouble as may be.

(Democritus)



Life is paradise, and we are all in paradise, but we won't see it; if we would, we should have heaven on earth the next day.

(Fyodor Dostoyevsky)



Cease, cows, life is short.

(Gabriel Garcia Marquez)



Useless life is only an early death.

Let us live while we are alive.

Only life's labors teach us to appreciate the good things in life.

Life is nature's most beautiful invention; and death her brilliant trick for having ever more life.

(Goethe)



Every man's life is a fairy tale, written by God's fingers.

(Hans Christian Andersen)



The only wealth is life.

(Henry David Thoreau)



Even the unhappiest life has its sunny moments and its little flowers of happiness between sand and stone.

*But I am interested only in the steps I took in my life to arrive at myself.
My life may have been arduous, wayward and unhappy, my experience of
humankind's bitter fate causing me to renounce and reject a great deal, but
it had been rich, proud and rich, a life – even its misery – fit for a king.*

(Hermann Hesse)



*Man's ability to think distinguishes human beings from animals and enables
them to obtain their livelihood.*

(Ibn Khaldun)



*There are people whose lives are so well fulfilled that even their death
cannot discourage us.*

Life gives us back only what we give to others.

Why, of all creatures is only given to a man hate your life?

*The life strength of a man is measured by, among others, his ability to
forget.*

*There were so many things in life we've been afraid of. And we shouldn't
have. It should have lived.*

*The course of events in life does not depend on us, never or very little, but
the way we handle these events, to a large extent depends on us.*

Good Lord, it's hard to be a man!

(Ivo Andric)



*I am beginning my book with the sentence: I want to live! This means that I
don't want to be carried on the flow of life. I want to live a quiet, focused
life, without fear of what will happen to me. All people consciously or
subconsciously fear that something will happen and change their seemingly
peaceful and safe existence. My book serves to prepare a man to for that
change.*

(Janez Drnovsek)



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Grains of sand create mountains, moments make years a little things – whole life.

(Jean-Baptiste Poquelin Molière)



Even if I was the immortal I would invent death - to convince myself of the beauty of life.

(Jean Richepin)



The privilege of a lifetime is being who you are.

(Joseph Campbell)



Life without love is like a tree without blossoms or fruit. And love without beauty is like flowers without fragrance, and fruit without seeds. Life, Love, and Beauty are three entities in one self, free and boundless, which know neither change nor separation.

Life without rebellion is like the seasons without spring. And rebellion without right is like spring in an arid and barren desert. Life, Rebellion, and Right are three entities in one self, and in them is neither change nor separation.

Life without freedom is like a body without a spirit. And freedom without thought is like a spirit confounded. Life, Freedom, and Thought are entities in one eternal self, which neither vanish nor pass away.

(Kahlil Gibran)



As a well-spent day brings happy sleep, so a life well spent brings happy death.

He who does not value life, does never deserved it.

(Leonardo da Vinci)



Live simply so that others may simply live.

My life is an indivisible whole, and all my activities run into one another and they have their rise in my insatiable love of mankind.

Life without principle is a ship without a rudder.

(Mahatma Gandhi)



Nothing in life is to be feared, it is only to be understood.

(Marie Curie)



The first rule is to keep an untroubled spirit. The second is to look things in the face and know them for what they are.

Dwell on the beauty of life. Watch the stars, and see yourself running with them.

A man's life is what his thoughts make of it.

(Marcus Aurelius)



Everyone seems to have a clear idea of how other people should lead their lives.

(Paulo Coelho)



Life is like the Olympic games; a few men strain their muscles to carry off a prize; others sell trinkets to the crowd for a profit.

(Pythagoras)



I slept and dreamed that life was joy. I awoke and saw that life was service. I acted and behold, service was joy.

(Rabindranath Tagore)



Our most important goal in life should be raising our souls. In other words, the progress of our spiritual and moral powers: to enlighten our spirit every day, and to feel more liberated and better person.

Thou should eat to live, not live to eat.

(Socrates)



Life can only be understood backwards, but it must be lived forwards.

(Sören Kierkegaard)

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*He then will be perfect in the spiritual life who is perfect in charity.
The good life achieved by the moral virtues is the life of a rightly ordered person.*

(Thomas Aquinas)



*Life's but a walking shadow; a poor player,
That struts and frets his hour upon the stage,
And then is heard no more: it is a tale
Told by an idiot, full of sound and fury.*

(William Shakespeare)



Arab proverb:

*Four things come not back: the spoken word, the sped arrows, the past life,
and neglected opportunity.*



Indian proverb:

*To live a pure unselfish life, one must count nothing as one's own in the
midst of abundance.*



Chinese proverb:

Life is a bridge, build no house upon it.



Latin proverbs:

Live your own life, for you will surely die your own death.

INSTEAD OF CONCLUSION

While I have been writing this book, I introspected if I have applied all the messages and reflections contained in it? That is what I always have been doing so far, not expecting anything from others; I have always tried to find satisfaction in giving my own contribution by working the best I can - with optimism that the world will be a better place, and with hope that people, even in politics, will be able to carry out reforms recommended by this book.

I arrived at to the final Chapter, and now I feel nervous: How will this book be accepted? At the beginning I wrote about the roots of my imagination and my experience; but, I did not particularly stress it, because, indeed, my experience and this book are just an atom in the constellation of human creativity.

The examples of great creators have been mentioned in order to illustrate the historical ascent of man. This book is not linked to any particular idea, but it sends the message that the power of ideas is essential. A power that can overcome everything on its way. The ideas that encourage creative potentials are justified and accepted. They are based on lasting values, ethical principles, and ideals of progress.

Ideas can be overestimated and underestimated. Neither are good. Examples of extremely overestimated ideas are the efforts of Hitler and Napoleon. Thus, it is necessary to establish a real relationship with the reality so that the ideas would not work against logic and against the same

reality. Simply, in this book I admonish that it is necessary to assess the idea and its power.

Ideas should be distinguished from illusions. People usually live their lives full of illusions, not seeing things around them as they really are; "they can not see the forest for the trees". When we get scared, we often think that the problem before us is huge, unsolvable. But if we realistically look at it, we realize that things are different. I will not talk about other dimensions of illusion, I will only add that illusions show the complexity of life.

The middle section of this book deals with the rise of an individual. Individuality is based on a number of elements: character, development, learning, communication, and health care... The aspects of individuality are numerous. Individuality does not deny the outside world, on the contrary. It confirms itself in contact with the world of others. An integrated personality is not inconsistent with the universality. Universal values can not be expressed without individual effects. Culture contributes to the creation of individual and universal values. Hegel said that *high culture is like a pyramid that can stand on a large scale of mediocrity, on the healthy and strong mediocrity*. In my understanding, the culture encompasses intellectual, artistic, and moral values. Culture promoted by this book is a development of our abilities. Without culture there is no inner affirmation of man's mental life. Those who read only books of their profession, of their narrow specialty, can not be regarded as cultured. What about nice literature? What about the music? We must meet with beauty and truth. Heraclitus said that *eyes and ears are bad witnesses to men having barbarian souls*.

We have seen the example of Nikola Tesla that effort without pressure can give remarkable energy and results. Tesla proved that spirit is the most powerful when guided by love. Even one day is not worth without love. Love is a mystery. The Secret of all secrets. Love comes from the heart. Thought, too. Thought(fulness) is often interpreted; I single out the views of Blaise Pascal: *Man is evidently made to think. Thought is all his*

Instead of conclusion

dignity, and all his worth. To think rightly, is the whole of his duty; and the true order of thought, is to begin with himself, with his author, and his end. Yet, what do men in general think? Never on these things; but how to obtain pleasure, wealth, or fame; how to become kings, without considering what it is to be a king, or even to be a man.

I believe in the power of spirit, and values that come with creativity. That is the most stable and the most valuable force. Thus is distinguished the power of force, and the power of creativity. The superiority of the human mind is inviolable.

About the Author

Prof. Dr. Radislav Jovovic is engaged in the fields of finance, economics, e-commerce, knowledge, individual development, entrepreneurship, international economics, and Game Theory.

He is the author of 7 books, 10 study manuals and scripts, and over 100 scientific papers. He is the co-author of 5 monographs, 4 books, and over 30 scientific papers. He has authored over 150 projects in the field of Cost Benefit Analysis, investments, business plans, information systems, process innovation, and spatial planning.

He is a consultant in the field of economics, business, finance and e-commerce for several international consulting firms, among them "PM Group" Dublin, The World Bank, European Commission, UNDP, The British Council etc. He also specialized economic analysis and projections in urban and spatial planning, where he made a number of projects with national and international companies. He has participated in over 200 domestic and foreign scientific conferences and symposiums. He is the editor of "Economics & Economy" journal, and the assistant editor of "Montenegrin Journal of Economics". He is a member of editorial boards of several scientific journals.