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**MUST
PANCREATIC CANCER
BE A SELF-INFLICTED TORMENT?**

**PERSONAL JOURNEY THROUGH THE
COUNTRY OF CANCER**

by GEORGE NATURALIST

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Must Pancreatic Cancer be a Self-Inflicted Torment?

Personal Journey through the Country of Cancer.

by George Naturalist

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Publisher: naturelaws.org

PO box 17644, Seattle, WA, 98127, USA

Publisher note: This book contains the descriptions and results of the author's fight against pancreatic cancer that attacked him in 2005 and of his attempts to find the reasons of cancer development in humans. Lifelong observations of his health conditions and thinking about what might influence it made a remarkable contribution and impact on his choice of methods of fight.

This book does not contain any personal prescriptions or advices and can be used as a reference volume only, not as medical manual. The procedures and speculations contained herein are not intended as a substitute for consultations with qualified licensed practitioners. Neither the publisher nor the author shall be liable or responsible for any loss or damage allegedly arising from any information or suggestions in this book.

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ISBN: 978-0-692-20366-8

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Introduction

The 20th century saw remarkable changes in the development of human civilization. However, the development combined both a splash of technology development with remarkable damage to nature. Two bloody world wars and multiple civilian and international wars around the globe aggravated the gloomy side of the history. It featured remarkable human interference into many processes of nature with the attempt to change them and dictate to nature ways to behave. This includes but is not limited with deforestation of the Earth and wet lands inning to the level that leads to climate changes; radioactive contamination of many areas of habitation; introduction of GMOs and use with easier unpredictable or very bad consequences. While some epidemic diseases, such as plagues were suppressed, new, not less dangerous and grim, pandemic diseases now challenge peaceful existence.

Among the notorious cancer diseases, pancreatic cancer is one of the major killers, as a rule within about six months of diagnosis. What results is an unsuccessful struggle within the brackets of modern conventional medicine, using very harmful means of intervention into the human body. The last six months of life for someone with this disease is typically a time of extreme suffering as the patient experiences severe symptoms of disorders and pain in the digestive tract, accompanied by terrifying attritional insomnia and complete frustration.

This book describes my personal journey struggling against pancreatic cancer. I share it because I believe my story might be helpful for others experiencing the same or similar health problems. I intentionally use the nickname "Naturalist" on the cover of the book to emphasize that the main, overall healing method in curing my cancer was abidance by the laws of nature. The method is absolutely natural and com-

This copy of the book "Must Pancreatic Cancer be a Self-Inflicted Torment" was downloaded free of charge from the website www.naturelaws.org/book completely avoids all artificial harmful interventions, such as "chemistry" or radiation. It returned my life to one of the vibrant health I enjoyed in my youth.

When I speculate on the reasons why this healing method works, I am far from thinking that I say something really new. Indeed, many of these speculations were probably presented before in a better form and from more learned professional sources. However, the composition of the material is such that makes them simpler and less wordy. At least, I believe, it is persuasive enough since contains my personal experience and experiments with my personal health that I describe as precisely as I can.

I was "lucky" to experience all the symptoms that accompany pancreatic cancer in January 2005. That was when I began to feel a sudden impairment of health, expressed in severe digestive disorders, pain in the gut, and frustrating insomnia. My visits to clinics and consultations with doctors did not provide any explanation. However, my good friend from a Research Medical Center found solid spots in the pancreas using ultrasonic diagnostics. A blood antibodies test confirmed his suspicions about tumors in the pancreas. Not a very long and joyful future lay ahead of me.

Nine years have passed since that time, and today my life is full of energy, impressions, and ideas. While my experience does not set up a claim to a scientific study, I hope the reader might find some ideas interesting to check. This story does not contain any universal prescriptions that might be good for everyone. If you decide and feel able to follow the same road, you can follow it in your own personal way, using what feels good for you and doing it at your personal discretion and taking full responsibility.

I am not a medical doctor and have no right to prescribe any healing medicine to anyone. My opinions are based on my good education and vast experience in research work that has committed me to the so-called "scientific method": experimentation, deriving conclusions of data, making speculations and substantiating them with further experiments.

I

The Beginning and Reversal of the Illness

What does a person with pancreatic cancer feel during the development of the cancer? There are multiple symptoms and ways of developing, individual for each person, depending on one's physiology and lifestyle. In my case, the development was slow enough to think about the causes, and began at the end of January 2005, with mild disorders of digestion, accompanied by diarrhea. It should be noted that I was not a weak person and at the age of 59, regularly engaged in athletic activities, such as tennis, snorkeling and mountain skiing. I am not ready to describe the reasons and details of getting ill in this story, but shall note that it was an introduction of cancer cells from outside.

Within about two weeks' time the diarrhea was becoming more severe and unpredictable and could wake me up in the night, or catch me somewhere on the road. It was accompanied with moderate but insistent pain in the guts. This also caused insomnia, nervous agitation and anxiety, aggravated by the fact that visits to medical clinics and seeing MDs did not bring any answers, on the contrary, brought more frustration because of mindless and snap prescriptions, made by the practitioners.

The symptoms were aggravated by eye irritation and a slight fever. Various medical tests also revealed chlamydia in my body. So, I had to undergo treatment for this nasty bacterium with strong antibiotics for three weeks. Yet this did not help to alleviate my digestive problems.

I wish I had kept a diary at this time, but I did not. A diary could protocol a record of the cancer development and provide me with a better understanding, but it was a time when problems did not encourage proper thinking and analysis. Despair prevailed.

As stated in the Introduction, my friend helped me to understand the reasons of the health disorders. My reaction

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was ambivalent. On the one hand, this understanding brought the comfort of certainty; on the other hand, the future looked gloomy. It might be interesting to note here that a short time before this, in December of 2004, not yet knowing what trials I would have to go through, out of plain curiosity I attended a workshop by former prominent neurosurgeon Galina Shatalova. That was one of those workshops that she delivered in many places of Russia and of the world, promoting her System of Natural Healing (SNH).

Galina Shatalova developed this system around 1970, successfully using it since then. At that time she was working as a major medical consultant and selector of cosmonauts at the "Star Village" (the center of cosmonaut training near Moscow, Russia). In her late fifties she switched from conventional, officially adopted medicine to naturopathy, using food products as medicine. She achieved remarkable results with her method, bringing many people who were facing the grave back to a normal life. Among her successful patients were people with cancer (up to fourth stage), diabetics, and autoimmune disease, on kidney dialysis, heart attacks and strokes victims, with high blood pressure, with gastric ulcer and so on.

At this workshop, she described one of the latest cases, which was her successful treatment of a woman in the fourth stage of cancer (more about Galina Shatalova and her method in the next chapter). Therefore, after being diagnosed, I had no hesitation following Shatalova's advice, and adopted a vegan diet as the primary treatment, accompanied with athletic activities and organism hardening procedures. All animal products and all fats and breads containing artificial yeasts and sugars were excluded from consumption. So my diet was limited to fruits, veggies and porridges. I also included into my diet red beets (she believed that red beets inhibit cancer cells), garlic, and I cooked and brewed teas with distilled water (more precisely, water purified with reverse osmosis) only.

I also limited the amount of food that I had every day to about three pounds of fruits and vegetables, a half of a pound

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of cooked whole grains and some nuts. Five billions of a naturally grown strain of bifidobacterium every day accompanied this diet for a week. The only difference between her advice and my diet was that I did not drink, as she recommended, 1.5 – 2 liters (3–4 pints) of fresh juices, considering it as not very important because I replaced juices with fruits and vegetables in their original form or had them as smoothies. She advised consuming uncooked sprouted wheat grains due to the fact that sprouts are rich in alpha-tocopherol (vitamin E), but I was unable to follow this advice due to the limited conditions of my living space at that time.

She drew attention to the importance of properly mixing food with saliva, when one eats. In her words, the number of chewing movements should be at least around fifty times for a single bite of food in the mouth. This advice was too difficult for me to follow, taking too much time, but I still tried to chew thoroughly enough, mixing food with saliva. Otherwise, I followed closely to everything that I heard at her workshop in December 2004.

Results developed as she predicted within three months, accompanied with weight loss of about 20%, from 172 to 130 pounds (I am 6'2" tall). My emaciation was frightening to the people around me. The insomnia that always accompanies cancer disappeared and I was sleeping at night more or less well. The diarrhea disappeared. Three months later the weight loss stopped, and it seemed, my body got adjusted to the new diet and quantity of food.

At first, cancer cells were circulating through the body, massing here and there in the form of small tumors in the body or bones, but after 9 months they stopped showing and disappeared. Besides, there was the nice addition of my physical capabilities in terms of endurance. I noticed that I could dive with snorkel in water a distance of 250 feet instead of 165 feet before, and could hold my breath in statics for 4.5 minutes instead of 3 minutes. I could spend hours mountain skiing and swimming miles without any noticeable signs of fatigue. My brain worked more efficiently, and my memory improved.

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The vegan system by Shatalova's style was so impressive that there was no a question of turning back anymore. Although, this was not absolutely new to me. From my previous experience of preventive fasting and abstention from animal meat for 30 years, I can say about myself that my physical abilities and mindset have changed dramatically with the transition to such restrictions in food as veganism, despite the fact that before this I was a fisheterian and mostly followed what is known as the Mediterranean diet.

In regard to the volume of the vegan food, which I tried to follow, there were some more or less steady habits. In the morning hours (from 6 am till 1-2 pm) it was teas only, brewed with various herbs containing no caffeine. My favorite was tea made from dried rose hips and schizandra berries. I also liked tea brewed with ginger. I never drank the usual tonic teas and coffee because of their strong influence on the nervous system, which added some nervous agitation. Solid types of food had their turn in the afternoon at one or two o'clock, having up to three meals a day, of one or one and a half pounds of vegan food (vegetables and fruits in pure form without the addition of vegetable oils).

When grains (such as wheat, millet, rye, amaranth, buckwheat, rice) and nuts were included, the amount of food could even be reduced. This corresponds approximately to the recommendations by Shatalova in calories. When I started eating more (for example, at the end of the summer there are a lot of delicious fresh apples – hard to resist the pleasure of eating them, because it seems that each of them adds an amazing life force), bringing the amount of food eaten to 7-8 pounds per day, I gained some additional weight that could reach up to 155-158 pounds and I felt worse then. The weight that I consider most appropriate for me and try to remain at is 145-150 pounds (I am 6'2" tall).

Sometimes I had food only once a day, but it required reasons such as important work or meetings, when I preferred to keep my thinking uninfluenced by food. As a rule, I never have food when I plan to go to the mountains or a swimming pool, especially since skiing in the mountains may take the

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whole day, I have no choice but to have food only once. In the usual days with no trips hunger began to interfere with the work. Besides, when one feels hunger, it is easy to overload stomach, having more than one and a half pounds of food, so I chose to have one meal a day at special occasions only. Over the years of the healthy life I enjoy now, a balance was developed that keeps the scales from tipping too far in the direction of the animal desire to eat to satiety and understanding that there is no great need of this.

When one is trying to limit the amount of food, it is always very helpful to employ some interesting activity that allows forgetting about the food and hunger. It is important though, not to overload the stomach after that as a result of hunger. Generally, in such a way of life one should make friends with the sense of hunger, realizing that it is a friend, not a foe. Overeating always slows down thinking and causes a desire to sleep and unwillingness to work. Then laziness always leads to overeating – a vicious circle.

My experiments with a complete abstaining of having food (fasting) in this period had not brought me positive results. There had been a resounding effect in terms of recovery, but the physical weakness prevented efficient work and brought a loss of weight which was scary. It's important to note that the results of my regimen are not indicative in all cases, and that others may choose different ways, allowing them to achieve better results. Here we are talking only about the fact that even such a small effort that I made by changing to a vegan diet produced tangible results.

Athletic activities were not very intensive at that time and corresponded to my job as researcher in experimental physics in the university. Yet, avoiding all obstacles, I always scheduled to spend at list one hour in a swimming pool, swimming without a single stop, or two hours of mountain skiing without rest in the wintertime, or playing tennis for two hours in the summer. And I did such activities at least two-three times a week, changing them depending on the circumstances.

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Hardening of the organism was another point of the healing system. The most frequent of these activities were showers with water of changing temperatures, going from one close to the body temperature to room temperature. I never used really cold water except when taking a Russian style steam-room (described in chapter V).

Those were the results of the System of Natural Healing implementation. I am grateful for the efforts of the system's founder Galina Shatalova. Though I never was her patient and never discussed my disease with her, and simply followed the general rules, I consider her as my doctor, who treated me. To be precise: so far I owe her nine years of my healthy and interesting life after cancer was suppressed. This is why I consider it important to describe Shatalova's life and her system of healing in more details in the next chapter.

II

Galina Shatalova and Her System of Natural Healing

I met Shatalova for the first time in September 1978 at a workshop she delivered in Moscow State University. She had a habit of bringing patients, whom she had cured, to such workshops, as proof of the effectiveness of her system. The stories told by her patients about their health problems and their miraculous recovery after following Shatalova's method, made a lasting impression.



The whole life-story of this extraordinary woman, her devotion to the physical and spiritual healing of people with outstanding results, deserves profound respect.

From her workshops it was clear: not only the composition but also the amount of consumed food play a crucial role in the healing process. Physical mobility and hardening of the organism procedures are also important. She sought to remind people that they are an integral part of nature, and asked not to forget this. The constituting part of her system is spiritual recovery, which allows filling the heart with love and getting rid of hatred. Her system and the results of people's recovery are remarkable: it cures almost all of the most brutal and deadly diseases of the internal organs, resulting from poor modern lifestyle choices and unnatural food.

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Shatalova healed hundreds if not thousands of people with serious diseases, even those facing an early grave due to the inability of conventional medicine to help them. As mentioned, her System of Natural Health can help people with cancer (up to fourth stage), diabetics, people with autoimmune disease, on kidney dialysis, heart attack and stroke victims, with high blood pressure, and gastric ulcer and so on.

At the workshop in 2004, she described the last case of her successful treatment of a woman in the fourth stage of cancer, whom orthodox medical officials had come to the end of their resources with giving her a month to live in pain before moving on to 'a better world'. Galina managed to cure this woman, calming down her frustration and giving her a hope for recovery. Shatalova used her private house as a hospital for this woman, giving personal care and supervising every piece of food that she had and her healing process every day. She was a doctor, a nurse, a cook and a personal trainer for this woman.

After a year of treating this patient by adhering to her system of natural healing, Shatalova showed her patient to the doctors, who 12 months earlier, had given her only one month to live. After intensive examinations they found no traces of cancer anywhere, yet they rejected to recognize Shatalova's System as a viable method of healing. Truly, the blindness and deafness of mankind is frightening!

I consider it interesting and meaningful to include an outline of Shatalova's life, based on her own words on the two occasions when I attended her lectures, as well as her publications and interviews.

Galina Shatalova was born in October 1916 in Pishpek (now Bishkek), the capital of Kyrgyzstan of Russian imperia. The family then moved to Rostov. Like many Russians she had mixed blood in her veins. On their family tree, the Polish branch was adjacent to the Georgian and Russian to Belarusian. Her parents belonged to an aristocratic family and were highly educated. Her mother, Antonia Antonyevna, was fluent in four European languages. Naturally, after the revolution of 1917, family life was extremely difficult, indeed, tragic. How-

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ever, losses and adversity only strengthened Galina's character and faith in people.

As a child she was very successfully engaged in music. Her parents thought that her future would be related to the fine arts. However, by force of circumstances as a teenager, she had the opportunity to attend a "dissection room". Quite unexpectedly for her parents, she came home not in terror, but in ineffable delight. After hearing his daughter's at how harmoniously the human body is arranged, Galina's father closed the piano's cover as a symbolic gesture. He realized that she had made her choice once and for all. (At this time Galina Shatalova was 13 years old).

Her admission to college was very problematic. After all, the social system in Russia in those days was such that a person's social origin played a decisive role in what they could and could not do, favoring workers and peasants ahead of aristocracy. To compensate for this, before entering medical school, Galina had to complete technical school. Admission to the school was conditional and dependent on her fulfilling a job, which meant she also had to work for a year in a tobacco factory (1931). She vividly described the caustic smell of tobacco, which saturated through everything: clothes, fingers, hair... In the evening, she studied at the Workers' school.

Once she gained the right to be admitted, she studied at Rostov Medical Institute from 1932 to 1938 and graduated with honors. Her graduation work was focused on the problems, associated with the higher nervous activity.

She studied medicine in the years of scientific activity of the great Russian neurosurgeon Ivan P. Pavlov, and mentioned that she was lucky to personally meet and talk with him. She described Pavlov as a true titan of science and regretted that many of his most daring ideas were not fully developed.

After graduating with honors in 1938, she worked as a clinical intern in the surgical clinic of the Rostov Medical Institute. During the Finnish and the World War II (1939-1945) she served in battlefield hospitals.

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In 1939, with the outbreak of hostilities on the Karelian Isthmus, she was drafted into the army as a military surgeon. In her own words, she had to "pass through fire and water" of military surgery in full there.

The winter of 1939 was unusually severe, and there were more frostbitten men than wounded. Her first scientific paper was written in those difficult days. She dedicated it to the problem of thawing frostbitten limbs.

From the first to the last day of WWII (called in Russia the Great Patriotic War) Galina served as a military field surgeon. So afterwards she was a skillful surgeon; and at the invitation of N. I. Burdenko, began working at the Central Institute of Neurosurgery, Academy of Sciences of the USSR. Thus she became a neurosurgeon.

When she sufficiently mastered this new specialization she summarized her experience in a Ph.D. thesis on the problems of plastics of dura mater defects. Soon after that, she was awarded the prestigious N. N. Burdenko prize. From then on, she devoted the rest of her life to research and used every opportunity to explore the truly inexhaustible possibilities of the human body.

It seemed that the road was wide open for her to well-being in life and in science. However, after years of working as a surgeon, her research into the self-healing capabilities of the human body eventually led her to see surgery as an extreme measure. In her words, it was scary to raise the knife over man, who could be healthy without surgery, if the necessary conditions for this could be created. She questioned – what exactly were these conditions?

She began looking for the answer to this back in the late 40's – early 50's, when, thanks to the development of relations with the countries of the East, she had the opportunity to communicate with Chinese, Japanese and Korean physicians. They strengthened her belief that people should study the laws of nature and abide by them.

Her acquaintance with Eastern Medicine and Philosophy made her realize the existence of a realm of knowledge far beyond the one adopted by mainstream science. An eternal

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seeker of truth, this new awareness intrigued her and she decided to explore alternative techniques and medical schools, which meant she had to leave the Institute.

She remarked that fortune spoiled her with unique meetings. Later on, she was fortunate to work under direct supervision by Academician Keldysh. Keldysh was a prominent physicist who participated and was leading the space research in Russia in 1960-ies. In the 1960s, work in the sector of selection and training of astronauts at the Academy of Sciences has convinced her that that the possibilities of a living organism are almost limitless.

At that time she started to build up her entire System of Natural Healing, studying the works of such luminaries as Vladimir Vernadsky, Sechenov, Pavlov as well as modern scientists, such as Nobel Prize winner Ilya Prigogine, Academician A. M. Ugolev. She also studied treatises that have been left by ancient healers of the East, Greece, and Rome. Any remaining gaps or questions were filled with the results of her own experiments.

In the 1970s she delivered first lectures in Moscow and began independent medical activity, using her system. This period of her life was the beginning of successful development and practicing of her System of Natural Healing. Here is how she described her motives for development of the system in one of her publications of 1980-ties:

"The number of sick people in the world is growing every year. Health problems have become the largest source of income for many corporations, and are far from a preventative direction. Russian state policy revamped the health care strategy. Organizers of the national health care system refused to ensure development of the preventive measures, which were used during the first decades of the Soviet regime. Domestic healing methods and proven home remedies were put on the rails of the western type of medicine.

Preventive measures were replaced with treatment of individual organs and symptoms of diseases. In the second half of the twentieth century epidemics of infectious and

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parasitic diseases have reappeared, and the country's medical statistics stated an incredible increase of chronic diseases.

There is no a way to expect for a miracle though. Medicine that focuses on treating disease symptoms rather than causes, leads, or rather, has led us to a dead end. People very rarely die due to old age. The vast majority of the population dies being "holders" of a whole bouquet of chronic diseases. It's fortunate, if one can live to an old age. But being dependent on medications is also not a life."

Shatalova's research and experiments are at the basis of her System of Natural Healing. She approaches human health and longevity in terms of the principle of energy feasibility and multi-channel replenishment of energy and matter by the human body, prescribed to us by nature.

She emphasized that was infinitely far from intention to create a new kind of religion, and therefore did not appeal to man's faith in a miracle, but to human minds and souls. She did not only rely on the strength of the emotional impact of words, but also on the power of true knowledge, based on the inexorable logic of facts. Another thing is that science accumulated facts that she considered under a different angle, from a rather unusual perspective. She mentioned that experience taught that the familiar was not always synonymous with the right.

Her dream was to return the person to himself, and help him to become what he is conceived and created by nature. She came to the people with a real system, theoretically sound, and proven in practice through many centuries of human experience. This system restored health in many people, who conventional medicine had sentenced to death.

She plunged into development of her SNH and tested it primarily on herself, with every cell of her body. Before she was 60 years old, Shatalova did not follow any regime at all and ate to satiety, having large amounts and literally anything, including meat pies, steaks and sweet cakes. With delight she remembered a fish pie of an incredible size, served with caviar for the New Year's party.

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She used to love cooking, and "pampering" herself and her family, coming up with different delicious dishes all the time, without giving much consideration to their nutritional content. However, once she understood the implications of species-specific nutrition, she gave it all up once and forever. Other postulates of her system were worked out simultaneously. Thus, she believed, she extended her active longevity. Even at the age of 87, she could still do "the splits" or undertake a multi-day crossing of the desert.

During the workshop in 2004 she told of a funny incident of her life. In 2001 she had been invited to lecture in Canada. Upon arriving at the airport, the passport control officer looked at her with interest and asked how old she was. Without a second thought, she replied that she was born in 1916 (she was 85 at this time). Her answer caused some commotion, and to her surprise and complete indignation a wheelchair was rushed to her, and before she knew it an assistant tried to seat her into it.

The humor of it was that she felt great after the flight! Not only fit enough to walk, but the first thing she did after arriving at the hotel, was to find the nearest beach and swim in the ocean with pleasure. And as the water temperature was plus 4-5 degrees (40-42F) at the time, she came out of the water feeling gorgeous, more than in high spirits.

She loved citing the words of Russian Academician Pavlov that the human body is capable not only to regulate and restore the consistency of its internal environment, but also to improve it, as long as the necessary conditions are met. She began searching for these "conditions" professionally in the 1950's, during her time as a Fellow of the Institute of Neurosurgery, Academy of Medical Sciences of the USSR, and continued this work till the end of her days.

She pointed out the wide-spread theory that the human organism gets all its energy exclusively from food. For example, if one runs a one-hundred-meter race and spends a certain amount of calories, one needs to eat food containing the same amount of calories to restore the energy spent. According to this theory, the caloric energy contained in these prod-

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ucts is determined by the methods of calorimetry, like wood burned in a furnace. Shatalova rigorously questioned the correctness of this method.

She repeatedly stated that the food is not wood, and the process of nutrition cannot be compared to a simple combustion. She was convinced that by its nature, our body is able to compensate for losses of energy with a low-calorie diet. She held that it is not about calories, but rather about the biological value and bioenergetic quality of foods.

She was repeatedly challenged on this issue. Defenders of the calorie theory queried if she remembered the law of energy and matter conservation, that for the basal metabolism the human body needs 1200–1700 calories, and in addition to this it is necessary to provide energy for its activity.

Her point was that by checking the caloric theory of a balanced diet in the light of the law, one can find a number of serious discrepancies between the theory and general practice. The facts do not fit into the Procrustean bed of the theory! For example the Institute of Nutrition calculated that marathon runners spend up to 8000 calories per day. How far can sportsmen run if they eat an 8000 calorie pile of food? No marathon runner eats that much. – or take a look at ballerinas. Every day training, rehearsals, performances – ballerinas hardly spend less energy than marathon runners, but if they would eat 8000 calories a day no partner would be able to lift them! Yet this theory has dominated for decades in the science and practice of nutrition, and in the technology of food production.

As a result, the diet does not meet the physiological needs of the human body both quantitatively and qualitatively. This is the main cause of contamination of the internal environment of the organism and the emergence of many diseases. Hence, this calls for new quantitative and qualitative standards of food hygiene according to the natural features of the human body and its social, geographical, climatic and other conditions of life.

She recalled how the marathon runners of the experimental group who participated in treatment with the daily re-

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gime of low-calorie food began joking, calling themselves "dystrophics". Why these "jokes"? They emerged, not by chance, but after publication by a number of scientists, who claimed she had developed a diet which would inevitably lead to malnutrition. Even in the Nazi concentration camp at Dachau, prisoners' caloric intake was significantly higher. In their enthusiasm for the high-calorie theory, such authors did not consider one important detail: the food consumed by the super-marathoners is consistent with natural human needs.

Shatalova argued that in Dachau prisoners ate cutlets made from sawdust and sprinkled with ersatz sauce. Caloric content of these products is certainly high, but it does not meet the natural needs of humans. She was saying that it was interested to know the opinion of her opponents about the question: how much would the fatness of the prisoners at Dachau increase if they were fed with double or triple amounts of the sawdust and, hence, the total caloric intake?

She said that the spontaneous approach to the complex process of nutrition, as part of the total energy exchange of the whole organism, clearly reveals shortages of calorimetric evaluation of the diet. Calorie is nothing more than a unit of heat energy released by a substance during the destruction of its chemical bonds in the combustion process. It's easy to count the number of calories released in the burning of protein, fat, and carbohydrate foods. But it's much more complicated to determine its biological value, digestibility, and nutritive value. Energy consumption and expenditures of our bodies require a different approach, because we are not isolated from the environment like the chamber of the calorimeter.

She insisted there are numerous experiments and observations that show our body is able to compensate for energy expenditures that far exceed the energy content of consumed food. To the question: how can this be? She answered that we have enough evidence to explain the multi-channel energy supply of the human body.

Considering the stereotype formed by centuries of people's old habits and whims, it is difficult to realize just how much the amount of food consumed can be reduced to fully

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satisfy the needs of a healthy person with a reasonable way of life.

The majority of people misrepresented the views on the need for nutrition, up to the absurd.

Shatalova provided examples. In New Zealand, there is a habit to take food seven times a day, made up of fantastic amounts of meat, eggs, sausages, sandwiches, and the like. New Zealanders are beginning to eat meals in bed before getting up, and they finish the day with the second, so-called small, dinner that may contain cold meat, lobster and other edibles.

In India however, people eat no more than twice a day. The majority of the population is vegetarians. The national dish is rice with vegetables and rice with vegetable sauce, usually served separately. Perhaps, the Indians are aware of the benefits of food combination. Not incidentally, their food is plentifully flavored with medicinal herbs. The nation Hunza in northern India is known to have the greatest life expectancy in the world. This nation absolutely does not consume animal proteins.

She continued that it's possible to observe eating habits of nations, historically associated with geographical location, economy, and culture, which do not sufficiently take into account the healthy human physiological needs. For example, in the last century, Germany was known for its obese people who preferred to stay ill but continue overeating. German cooks are specialists in manufacturing hams, sausages, and frankfurters in an especially diversified diet of meat, all sorts of fish dishes, baked sweet jelly, pies, cakes and more.

German cuisine greatly influenced the diet in Russia. It is enough to remember the schnitzels, beefsteaks and rom-steaks, roast beefs, and entrecotes which are popular today, not only on the menus of sit-down restaurants, but also in our everyday diet. We forgot the beautiful Russian cereals, Russian soup, medicinal Russian oat wash-brew, pickled apples, honey and horseradish kvass, and the bread made with hop yeast.

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I agree with her statement that, unfortunately, the eating habits of people are clogged with bad habits. It became the rule to spice up appetite by combining incompatible products. Food is tinted, salted, sweetened. And the sense of proportions has changed. At the same time the excretory system is overloaded and the body's internal environment is filled with unexcreted metabolic products. These are deposited in the walls of blood vessels in the intercellular spaces and, finally, in the cells, disrupting metabolic processes. Isn't this the reason for many of our diseases?

Shatalova was facing many types of opposition to her System. She mentioned some of them as she presented her arguments. She remembered how she had to hear intently wary questions, such as: Can vegetarianism lead to the extinction of mental abilities? Her answer: recall the lifestyle and diet of Leo Tolstoy, Alexander Suvorov, Roman Rolland, Jack London, George Bernard Shaw and many other thinkers who were followers of the strict vegetarian diet. She added that she had not consumed animal protein in her diet for 30 years without noticing any deterioration of memory.

Some ask about the classic experiments by A. A. Pokrovsky who, a quarter century ago allegedly proved that the restriction of consumption of animal protein negatively impacts the mental abilities of man. He did not share the view of the great thinkers, the vegetarians, who exemplify creative longevity. However, the scientist studied the rationality of human nutrition in experiments with rodents that proved the brains of rats are directly related to diet. Consumption of animal protein allowed them to better navigate in complicated situations. The results of the experiments were mechanically transferred to humans. And up to this day, protein diet is calculated in accordance with the classical experiments on rodents!

She further questioned the accuracy in the transfer of the experimental results made with rats to human beings in such a fine area as mental activity. It should be remembered that nature features a specific program of life and specific nature of nutrition to each kind of animal. For example, nobody

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would think of feeding grass to a tiger or a lion, or meat to a camel or horse.

A careful study of the table of the comparative anatomical and physiological characteristics of animal species clearly shows that humans do not have any signs of a predator. Moreover, for the many thousands of years when people began meat consumption, the human's body did not undergo evolutionary change similar to the signs of a predator.

The study of the characteristics of food consumption in various representatives of the animal world, note not only the commonality of some physiological parameters, but also a clear distinction of specific needs that are programmed by nature. For example, the tiger can eat only fresh meat of its victim. Herbivores have equally clear preferences: camels prefer camel thorns, elks are not averse to eat young aspen bark, and the horse prefers grain. That is the program of the nature. Do humans carry such features of nutrition programmed by nature?

Shatalova stated that in experiments with healthy men, the optimal diet contains fruits, vegetables, berries, edible wild herbs and vegetables, seeds, nuts, honey, grains and cereal grains. In that case, if fresh food is cooked in an appetizing way and retains its bio-energetic value, one or two meals a day are enough. Of course, it is necessary to comply with food consistency, taking into account the anatomical and physiological characteristics of the individual.

The basics of the System of Natural Healing (SNH):

Shatalova was a strong opponent to violence in all its forms, even avoiding using the words *obligation* and *must*. Her only dream was to return persons to themselves, help them become what they were conceived and created by nature to become. Her System noted not comprised of accusing sermons, demagogic appeals, slogans or just a set of good wishes. It is a real system, absorbed by the centuries-old experience of humankind, proven through practice. Her system is the one that has already brought healing and health to many people who traditional medicine had sentenced to death. It is

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not a mystery; it does not require human supernatural qualities and long complicated preparation. What's needed are only mind and will.

Following the System of Natural Healing should be conscious. It is important not only to mechanically learn the complexes of breathing and physical exercises, hardening procedures, and recommended diets, but also to understand the laws of nature performed through the basic life processes of the human body. Active participation of the conscious and subconscious in the healing process is as much a part of the system as everything else.

There are two fundamentally important ideas, which are reflected in its title.

First, it is a System of Natural Healing, a stress **system**. In other words, if one wants to be healthy, one should be patient, not for a week or a month, but for life. One has to work hard to rebuild psychology and lifestyle.

The foregoing, of course, does not preclude the use of techniques described in the book to solve some local problems — for example, to lose excess weight or get rid of dyspnea and colds.

Secondly, it is necessary to pay attention to the word “natural” in the definition of System of Natural Healing. This implies the need to abide by the laws of nature that determine our existence.

Shatalova repeatedly stated that the three pillars on which the whole edifice of the System of Natural Healing rests are spiritual, mental, and physical health. And please, note that spiritual health is in first place.

Spiritual health requires the absence of selfishness, the presence of tolerance, a desire for unity with nature in the broadest sense, understanding the laws of the unity of all living matter, and the principles of ethics and universal love. It must be understood that spiritual health is not just *one* of the possible ways to develop and improve human society, but the *only one*. Spiritual health gives us hope to survive all together.

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Her emphasis of the importance to spiritual health took her to the extent that if a spiritually flawed person appealed to her for help, she was reluctant. She considered anger, envy, hatred, pettiness, greed, and domination over ones soul as corroded health with a consistency of an acid to dissolve the most of durable metals. Any treatment in such conditions could not bring healing.

Closely connected with the spiritual is mental health. By this she meant a harmonious blend of conscious and sub-conscious. The unity of conscious and subconscious provides the human body with stability and the inherited mechanisms of the species' adaptation to the environment, while at the same time it determines the susceptibility to change — adaptability.

Much attention in the system is paid to the psychological mood as a cornerstone of the SNH, as a precondition for restoring the unity of humans with nature.

Thirdly, the final element of the triad is physical health. This is an integral component, which is difficult to study, first of all because absolute health today is a rarity.

Following is an outline of the contours of the System and the goal towards which to aspire, including other challenges.

Practical means of SNH

Shatalova stated that the basics of the SNH development are founded on beliefs of the ancient Greeks, Romans, and Egyptians, which reflect higher understanding of the principles of physical health and the importance of the unity of organism and environment.

Practical framework comprises methods and techniques, many of which have been known to humankind since ancient times. There are the elements of ancient Indian and ancient Chinese traditional medicine, various systems of martial arts, and breathing exercises in all their diversity.

She emphasized that this whole set of techniques is intended to normalize the functioning of the body processes, such as breathing, thermoregulation, mental activity and, of course, digestion. Special sections are devoted to each of

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them. Below you will find specific tips and recommendations. She mentioned these processes with a single purpose — to determine the place and role of each in the human organism and in the system of its natural healing.

Positive Mental Attitude

Much attention in the system is paid to the psychological mood as a cornerstone of the System of Natural Healing, a precondition for restoring the unity of humans and nature.

Benevolence should reign here to set up mental harmony, the desire to be active for the benefits of the society. She emphasized the proverb: “He is a happy survivor who feels useful and necessary in the society of equals”.

Breathing

Correct breathing is one of the most important parts of healthy living for Shatalova, expressing, “Among the vital needs of human beings, breath is the most important. If without water, a person can live for several days, without food for weeks and months, without movement for years, but without breathing for only seconds or minutes at best.”

The word "right" refers to normal breathing, inherent to healthy people. To achieve this, a prerequisite is required: go to the species' healthful nutrition. When one achieves this, then the respiratory rate will drop to 4-5 cycles per minute. When running, it is naturally slightly higher and depends on the rate of movement. One should remember: exhalation should be longer than the inhalation, especially during prolonged exercise. For example, if inhalation takes two steps while walking, then exhalation needs three, four, or five. Do not hold the breath artificially.

Breathe only through the nose and try to take a breath through the upper third of the nose, at the place where the person has a complex system of air "processing" before it enters the lungs.

Food

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It's necessary to admit that food plays a remarkable role in healthy wellbeing. Concerning food, Shatalova's major statement was that the human body is naturally preprogrammed for certain types of food, mainly of plant origin. It is caused by natural anatomical and physiological characteristics of the body. Therefore violation of constancy of species nutrition is the cause of many, many illnesses.

It happens due to the fact that in the course of historical development, people moved far away from the projected program of the species due to the expansion of use of animal products. Undoubtedly, on the one hand, this increased humans' ability to fight for survival; on the other, it was the cause of many of the deviations from normal physical health, as digestion of meat or fish food may only occur at the expense of adaptive reserves.

She insisted that the widely held perception of food as the only source of energy replenishment for a person inflicted huge damage to human health. These representations were initiated at the end of the nineteenth century, when the World Health Organization Congress approved the proposal of the German scientists to determine the amount of food necessary for a person, according to its caloric content. Thus the foundation of the calorie theory of food was laid. And the average dietary energy supply of the German population was taken as its reference.

It was a progressive step for the time, because it became possible to somehow regulate the diet. Now, 130 years later, official science has offered essentially nothing new. The Nutrition Institute of the USSR Academy of Medical Sciences once reduced calorie intake a little. However, the very calorie theory of balanced diet continues to rule the roost, day after day, year after year, maiming people and shortening their lives.

The method of calculating the amount of energy released by a variety of food was developed. Shatalova sneered at the idea it was determined by burning calories and summarizing the amount of heat received from this. Based on this theory, doctors recommend having 80-100 g of protein, 80-

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100 g of fat, 400–500 grams of carbohydrates a day. Translated into the products, that amounts to about 0.5 kg of meat, 80–100 g of fat, 1.5–2 kg of vegetables, cereals, sugar and bread.

She wanted to stop the people who were trying to follow such recommendations. Over about 30 years of her personal practice, she managed to reduce the amount of food in the recommendations several times smaller: 11 g of protein, 10 g of fat, 100–200 grams of carbohydrates, and she felt great.

She often joked that by her age, she should be content to "knit stockings", but she was constantly in motion instead. During the 1980s, in her 60s, she made four foot-crossings of the hot sands of the Central Karakum and Kyzyl-Kum deserts and joined a group of like-minded people who made the hike from Nalchik to Pitsunda, crossing four mountain passes.

Motion

The System of Natural Healing movement places the importance in nutrition, proper breathing, and hardening. When asked where to start to reach the natural way of life, Shatalova answered, "All at once." That is, begin with better nutrition choices, with adopting good habits of breathing with breathing exercises, and, most importantly, establish a healthy psychological mood and level of activity.

She advised: put on a lightweight sports suit that will not limit movement, and run. If you cannot run, walk. If you cannot walk, crawl! But move, so that your energy generating system receives a full incentive for hard work, so that all processes that ensure functioning of the organisms proceed actively and optimally.

She understood the word *motion* to mean not only the possibility of a living organism to change its position in space (call it external motion), but also the processes occurring inside the body (internal motion).

The main feature of her motion system is that it includes dynamic autogenic training as an essential element. In

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other words, the training ability to consciously control and regulate the energy flow in the process of motion.

The most natural human heavy motion is running. While running, the whole body is literally turned on. If someone does not like running, then one can practice walking. Of course, walking and running do not exclude other techniques and physical exercises, but rather suggest that people will combine them with other exercises.

She taught: running should be easy, free, and relaxing for all muscles. Trust your body; it knows best what it needs. But this does not mean that you should not help it. Question: how? Answer: It is important not to cross the line beyond which aid turns into an obstacle. Dynamic Autogenous Training, which is the basis of the motion techniques, helps in this.

What is the meaning of “dynamic autogenous training”?

Dynamic autogenous training means keeping all the muscles relaxed, other than those that are currently at work. Running gives good results when it is accompanied with proper breathing only. If you have difficulty running, engage walking. Moreover requirements remain the same as with running.

But we should not think that running or walking can completely prevent or cure disease; rather that the main cause of disease is the lack of physical activity. Very much depends on the condition of the spine and posture. The cervical spine is the most responsible. When the intervertebral discs lose their shape and elasticity, breaking the configuration of the spinal column, a person loses not only the correct posture, but also loses health. Do not forget to train the back and all other joints of your body.

Hardening of the organism (normalization of natural thermoregulation)

Concerning body normal thermoregulation ability Shatalova stated that all species, including humans, have their own specific limited range of the temperatures of existence. The pampering effects of modern civilization have narrowed

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boundaries of the range to humans, which cannot be considered normal.

People should not feel any particular problem with the heat or cold. But the most important is that one should not be afraid of the cold. Cold should be an ally to humans, because it mobilizes the body's defenses, harmonizes its activity, and stimulates the process of self-regulation. This is the meaning of the organism hardening procedures, which is organically included into the System of Natural Healing.

Modern humans are utterly pampered by civilization. If our ancestors were like us, at least to some extent, none of us could survive up to now. Humans would simply disappear from the face of the earth as a biologically defective form.

She advised: it all depends on your health and your constitution. If you are young and healthy, after your morning physical exercises outdoors, immediately begin rubbing the body with snow. In the summer, pour cold water over your body. As often as possible, swim in the open water.

An ageing person, even those without disease, or an ill person, should not hurry. Start small. Pour cold water or better icy water into a foot pan and immerse one leg for a moment. Immediately rub it with a towel and put on a wool sock. Then do the same with the other leg. Gradually increase the duration of the procedure; the important thing here is regularity. You cannot miss a single day. Even a short break can negate your efforts.

When you feel the icy footbaths started to bring you pleasure, you can move on. For example, she preferred a bucket of icy water to any shower. She advised: “blow the grampus and capture the spirit”. This strengthens the body and the soul feels joy.

Aged people, who are not ready for the cold procedures, can start with a cool shower. Water temperature is adjusted in accordance with the state of health. As you become adapted, gradually lower it, but gradually. Hardening as well as jogging should not cause discomfort. Trust your body; listen to its voice. Once the water temperature is minimal and you learn to take cold showers without consequences, start

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wiping snow. If you feel like it, even take a bath in the ice hole of a river.

That's how she described the organism hardening procedure. People suffering from any illness need special care. After the icy footbaths, rub the body with a wet towel. Within a few days, use towel, sponge, or just the hand moistened with water for rubbing.

After wet rubbing of the limbs, neck, chest and back, wipe them dry with a towel and rub to redness. Duration of treatment initially should not exceed five minutes.

Gradually lower the temperature of water. Do not force events. Of primary importance is how your body feels after the procedure. Avoid any unpleasant sensations and eventually you will be able to experience some, if not all, of the ten benefits of cold water, according to the ancient Indian sages: mental clarity, freshness, vigor, health, strength, beauty, youth, cleanliness, pleasant skin color and the attention of the other sex.

Patients returned to healthy life with the System:

Shatalova described the history of some of her patients. One was a woman named Svetlana. Just a few years ago, this slim, charming young woman with curly hair was on the verge of collapse, suffering under the burden of cardiovascular, pulmonary, gastrointestinal, and skin diseases. Svetlana had been ill since childhood. The school constantly disengaged her from the athletic training. In the university, she once tried to run the hundred meter race, but it ended with fainting.

After graduation, constant supervision of qualified doctors of the clinic at the Academy of Science of the USSR made beneficial effects on her health, but not for a long time. Gradually, her medical history swelled with the records of internists, gynecologists, pulmonologists, gastroenterologists, cardiologists, oncologists, neurologists, dermatologists, and other physicians.

Svetlana became a very sick woman with lusterless eyes, an aging puffy face and bloated figure that was breathless because of asthmatic bronchitis, heart disease, inflamma-

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tion of the gall bladder, pancreatitis, hepatitis, gastritis, spastic colitis, cervical degenerative disc disease of the spine, stomach ulcers, and other chronic diseases. She was a researcher of a rare and interesting profession and loved her job, but felt that she was becoming a burden on the shoulders of colleagues, becoming less and less employable.

About the half of the work year she spent in the hospital regime. Her large and friendly family actually lost its daughter, and emergency room physicians became frequent visitors to their home. New diseases showed up in abundance! A growing tumor was revealed in the abdominal cavity, but surgical intervention was delayed by asthmatic bronchitis, severe drug allergy, and almost incessant cold conditions obstructed abdominal surgery.

One oncology surgeon directed the sick woman to Shatalova with a request to improve Svetlana's health before the upcoming serious operation. But Shatalova began treating her in accordance with her principles. Treatment was ambulatory, without job interruption. In a short time a remarkable record in Svetlana's medical history appeared: the doctor noted a gradual reverse of the swell in the abdomen. The need for abdominal surgery no longer existed!

A year after the start of treatment, it appeared that Svetlana was doing so well that she might go for a long ocean trip in the tropical zone. Physicians recorded in the "Seaman's Book" unconditionally "healthy".

Svetlana is coping with the affairs of her job and is busy with housework, but at the same time every day she finds time for a morning run, a special set of movements and breathing, and more. Even a winter blizzard does not make her put on a cap and sweater for jogging wear. Gradually she learned the Russian "hardening run". She eats according to a diet that consumes not more than 1000 kcalories a day.

Shatalova mentioned that she loved her patient Svetlana and called her "the highest embodiment of the limitless resources of nature" since Ivan Pavlov defined the place of humans in the world in this way.

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After that she mentioned insulin dependent diabetes, which affected more than ten million people in Russia at that time. She said that when she was a student in the 1930s, and then a clinical intern in the surgical clinic of the Rostov Medical Institute, insulin-dependent diabetes was an extremely rare disease and was considered hereditary. Today, the disease has affected many, too many. *Why do we not think about a new form of insulin-dependent disease?* she asked herself.

Thinking in this way, Shatalova found a solution. Back in the 1970s she was able to heal a new form of insulin-dependent diabetes. The first was a patient named Shneerov. He suffered diabetes, complicated by severe furunculosis. She reported about such patients to the Scientific Council of the Ministry of Health. At the same time, she stressed that the System of Natural Healing in the short term, without major cash outlay, could achieve good results, as long as the patients were responsible for their own health and avoided addictions and whims in their lifestyle. In other words, she didn't want to treat symptoms of the disease, but the patient, to eliminate the cause of disease.

The cause of Shneerov's disease was a severe psychological trauma at work, excessive appetite with special predilection for meat and sausages, listlessness and a dull craving for an excessive stay on the couch — a pure Oblomovism associated again with the troubles at work. She took into account all of this, and, with the help of his wife, the patient fully changed his way of life. This allowed the patient to get rid of injections of large, seemingly appropriate, insulin doses. Shneerov revived; he came back to himself by leaps and bounds. His sense of smell and taste of food returned to him. He told me that he finally could hear the spring chirpings of birds, admire the fresh green of trees, and hear cheerful voices of his grandchildren.

Shatalova's other patient was a woman who yearned to get rid of insulin injections. Natalia Olafovna was a wife of a deputy director of the Central House of Artists in Moscow. One leg was in her elegant slipper, and the other wore a bulky orthopedic boot, the result of complications of insulin-

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dependent diabetes. After a short period of treatment with the System of Natural Healing, she got rid of the need for the insulin injection. Her appearance changed so much that she had to replace her passport after hearing often, "That is not you on the picture."

Next story. A doctor of one the leading medical therapeutic clinics in Moscow asked to dismiss the need for insulin injections to his young cousin, who already had started to lose his vision as a result of insulin therapy. After only five days of intensive treatment, he achieved the desired results. He was healthy, and this was for life.

Shatalova noticed that no doubt, insulin is needed in the acute stage of the disease. But to live with it for a lifetime is ignorance. Alas, having a powerful technique, we do not understand quite enough about the essence of our relationship with nature. Maybe that's why scientific progress today often leads to negative consequences. We are destroying not only the external area of the dwelling, but also the internal environment of the body, acquiring diseases, reducing the period of normal working ability and creative longevity.

First of all, she was reminded of the experience of Sparta, the ancient Greek city-state. It is known that young men in their teens and old people could coexist there in the same ranks. All managed with very meager diets, and high physical activity! However, her own experience in extreme sports, and later work on the training of astronauts, pushed her to similar conclusions. The human body derives energy from nature, provided that the link is not broken. The purpose of her healing system is the return not only to physical, but primarily spiritual health, and restoring the natural harmony.

She was saying that the great Pavlov proved experimentally that the leading role in the digestive process belongs to the brain. Therefore, it should be "running the show" in all matters related to nutrition. Slaves of gluttony pay for hours of fun with years of life. After all, our stomach is small in size and is designed for about 200 grams of food consumed. Sometimes we are ready to stretch it to infinity, thus acting contrary to nature. The material of the cookware is also of

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considerable importance. Aluminum pans must be mercilessly driven out of every kitchen and replaced with enamel and, even better, with clay vessels.

Without a radical change in our habits, we will never move from disease treatment to the maintenance of health, to good nutrition, skills of correct breathing, movement, as well as procedures for hardening — all integral parts of the System of Natural Healing. Shatalova said that she is convinced that the human body is fabulously interesting, but the key to the treasury, which holds its reserves, was lost in the ways of civilization and the false notion of progress. Taking it back will require a lot of efforts. Yet the most important point is mental health.

The soul of humans must be filled with a noble quest for truth, goodness and beauty. This is what Socrates dreamed about in his time; but his natural longevity was interrupted with hemlock. The greatest philosopher of antiquity was sentenced to death for free-thinking, yet no one has managed to clip the wings of human thought. Free, it flies through the centuries and millennia, rising higher and higher, to the dazzling heights of the Spirit.

Group experiments

Besides individual practices with ill people, Shatalova showed abilities of her system to the wide public, with organized participation of her former patients in different athletic activities. That's how she described these events: The rationalization of the principles of this system required to conduct a series of experiments.

Super marathons

One of the experiments took place in 1983. It was conducted under the supervision of an authoritative committee of All-Union Scientific Research Institute of Athletic Culture (VNIIFK). In those days, the amateur runners planned to compete in a super marathon run. The distance of 500-kilometer (312 miles) of the road race was planned to be covered within seven days by men. The racing speed rate was one kilometer

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in not less than six minutes. About 65–75 kilometers (40–47 miles) a day. Women should cover half of the distance.

An experimental group of volunteers, who had previously been prepared by Shatalova on the program of the System of Natural Healing, were participating in the marathon on general grounds. Volunteers had mastered the technique of dynamic autogenic training, health training, breathing exercises, and nutrition on the new bio-energy basis. The food with specialized recipes was prepared for them under the supervision of a Commission. The group was fed simultaneously with the main group of the participants in the marathon but at a separate table characterized by colorful dishes, richly decorated with fresh spring greens, vegetables, and fruits.

The experimental group was fed with decoctions of herbs, juices, honey, salad vegetables and herbs, and fresh porridge on water. Cakes were made from rye flour with grass flour on the clabber. They also had boiled beans and nuts. On the trail, all were offered "candy" from the rolled-up dried fruit and nuts, but athletes did not need them. The quantity and quality of food quite satisfied athletes. Counting all intakes, runners got 28 grams of protein, 25 grams of fat, 180 grams of carbohydrates, which in total amounted to 1200 kcalories a day.

But the control and the main group of runners were fed according to the norms of energy of the Institute of Medical Sciences of the USSR. They consumed 190 grams of protein, the same amount of fat, 1300 grams of carbohydrates, which amounted to 6000 kcalories a day. Recipes were cooked according to calorie theory of a balanced diet. Tables were laden with food containing delicatessens, meat cuts, sausages, ham, cheese and butter, splints, roast beef or chops, with ample side dishes, soups, puddings and the like, the most common foods. On the trail they received extra food — oatmeal jelly and crackers.

The participants of the experiment were under the vigilant control of the commission, both during the run and during the meal. Runners of the experimental and control groups of the marathon were weighed regularly. Long col-

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umns of numbers filled minutes of the commission. The results exceeded the expectations. Records of the Commission testified that less physically trained athletes of the experimental group were more enduring and did not lose weight as opposed to a control group of athletes who were engaged in the same physical activities and showed the same sports indices figures of running, but consumed five times more of the high-kcalorie food! Weight of the runners of this group was less stable during the run as well as at its end.

And a remarkable thing occurred. The marathon ended late in the evening; the next morning all participants of the experimental group were at their usual workplaces.

In the All-Union Scientific Research Institute of Athletic Culture, where the results of the experiment were discussed and the acts of the commission endorsed, and where she reported the results of her observations, the experiment was considered unique. It was decided to repeat the experiment with the participation of athletes of the highest category. According to this decision, a master of sports, Anna Kharitonova, was prepared by a special program to participate in the experiment.

The new experiment also took place during April's marathon in honor of Cosmonaut Day. This time the distance was 450 kilometers (281 miles). A representative commission of VNIIFK recorded the results. It is noteworthy that this time the participant of the experimental group, sportsmaster Anna Kharitonova, reached a record long run; she covered the 450-kilometer distance, finishing in sixth place among male super marathoners. During the run the athlete was fed according to the already well-known diet that does not exceed 1200 kcalories per day, and her body weight remained stable.

Unique results and sports achievements with low-calorie and low-protein diet were made in recent years by climbers making the ascent to the mountain peaks by numerous groups of mountain tourists and, finally, by the participants of the amateur mass marathons. In the Novosibirsk Akademgorodok it has become a tradition to hold a spring marathon on a low-calorie and low-protein diet.

Menu of the super-marathon experimental group:

BREAKFAST:

Decoction of herbs with lemon juice, flavored with honey

LUNCH:

Freshly prepared infusion of rosehips with honey

Freshly prepared salads of various vegetables, richly flavored citrus juice and fresh spring greens

Specially prepared meals from whole cereal grains richly seasoned with fresh herbs and dried herbs, with a little vegetable oil and dried seaweed

DINNER:

Tea of the rose petals, hawthorn flowers, leaves, magnolia, jasmine flowers, and fireweed

Freshly made fruit and vegetable juice

CHOICE OF SUCH COURSES:

Salad of boiled beets with horseradish, garlic or honey, and lemon juice

Salad of shredded pumpkin and carrots with sea buckthorn juice with honey

Salad of coarsely chopped cabbage or cauliflower with lots of greenery (served with freshly made peanut sauce with milk or oatmeal with nuts)

Boiled beans, flavored spices, nuts, and garlic

Rye bread with plenty of grated dried herbs

Buckwheat porridge cooked in water only

After super-marathons, Shatalova decided to conduct new experiments with climbers and mountain tourists.

The expedition in a mountaineering camp in Ala-Archa

The continuation of the experiment was the expedition of mountain climbers in a mountaineering tourist camp Ala-Archa, which involved two men and two women (including Shatalova). They woke up before sunrise and went without breakfast to the mountains. After about 15 km (9 miles) (by pedometer), and by five o'clock in the evening, they returned to the camp. Here, a physician and a head of the camp weighed and examined them; and then they went to dinner.

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Their diet consisted of hot soup, freshly cooked porridge of wheat sprouts, wild herb teas with juniper and barberry. After dinner, quietly conversing, they walked 10 km (6 miles), but no longer up and down the slopes of the mountains, and then came back. Thus, during the day they walked about 25 km (16 miles). They slept outdoors, had food once a day, drank two times. None of them lost weight or got sick. On the contrary, they went home rested and full of energy.

Hike from Nalchik to Pitsunda.

This hike lasted 23 days. The daily diet consisted of 50 g of buckwheat and 100 g of dried fruit. During the days of this journey, they encountered four mountain passes. They entered Pitsunda bouncy and cheerful, while their casual companions — tourists, eating in accordance with the recommendations of the theory of a balanced diet — barely moved their legs due to fatigue.

Hike through the Central Asian desert.



Even more impressive were the results of hikes through the Central Asian desert, by Shatalova. All participants were receiving more than 600 kcalories a day, while covering to 18–20 miles a day on the loose sands of a sharply continental desert climate. Shatalova explained further that in the conditions of high temperatures and lack of water, the human body, returned by SNH to its normal state, demonstrates its endless possibilities convincingly.

Hike through the Kyzyl Kum (Aral-Karateren, 125 km (78 miles), Summer 1987)

The main purpose of this hike was to check, at the request of the Geographical Society of the USSR, the possibility of reducing water consumption of the human body in the desert. [It had been believed that in the heat of the summer, during hiking expeditions in the hot sands, the need of water

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is at least 10 liters per person.] Shatalova put the issue more broadly: what is the general need of water for a truly healthy person with a rational diet? When developing methods of water use optimization, she made extensive use of her previous observation of the local residents, made at a time when they were not spoiled with multiple wells. At that time she was surprised that for many tens of kilometers of the road in the desert, they were taking with them only two small bottles of water.

The group (11 people) was composed of scientists who needed to examine the dry bed of the Aral Sea with the complete lack of water, since there was not a single well on the road, for them or for tourists. All of the scientists had been trained in the System of Natural Healing and had completely switched to the healthy food. The group was supposed to cover the distance of 125 km. (78 miles) between Aral and Karateren (Kazakhstan) within seven days, but they managed it in five. Shatalova, already over 70 years old, was not a burden; on the contrary, she cheered her companions and set an example of endurance and patience.

During the experiment, she was able to reduce water consumption in the desert by 10 times. And the most important thing that played a decisive role was that participants consumed only low-protein, low-kcalorie food, completely devoid of animal products, which require 42 g of water per 1 g of protein. Secondly, they were drinking water enriched with herbs, which does not increase, but decreases the temperature of the body.

This research led to the conclusion that the body, even not accustomed to the unusual heat, but posed in terms of specific power, perfectly manages 1.2 liters of water per day.

Beginning the experiment Shatalova least expected that it could have such profound impact. A lot of letters came, including from abroad, and along with the words of admiration there were slipped notes of doubts. A letter, which came from the former Czechoslovakia, stated that the reduction in water consumption below 10 liters is simply impossible for purely physiological reasons.

Joint hike with the Czechs (134 km (84 miles), 1988)

In order to dispel the doubts of her opponents, Shatalova decided to organize another expedition, inviting participants from Czechoslovakia. Such joint expeditions took place as early as the following year, 1988. It included six people on each side, five people living in the System of Natural Healing, plus Shatalova, and five well-trained athletes from Czechoslovakia. The sixth was their interpreter.

Soviet participants were less trained; nevertheless all of them covered the distance. Three participants of the foreign group dropped out even before starting the move, and the rest, including the interpreter, covered 134 km. After that distance, they ran out of energy. This should be expected because they ate high-kcalorie food which contained large amounts of animal protein, and each drank at least 10 liters of water per day. At the same time they looked extremely emaciated. The members of Shatalova's group looked great and felt so good that, after bringing their foreign colleagues to habitable places, decided to return back to the 134th km. of the route and continued over 272 km. more.

Hiking through the Central Karakum (Baharden - Kur-tamyshsky Reserve, 500 km (312 miles), 1990)

Shatalova reported the results of all the experiments conducted in the years of 1983-1989 at the Research Institute of Athletic Culture (VNIIFK). The report made such a great impression that she was financed for one more final, and the most ambitious and demonstrative, hiking project.

The purpose of it was verification of human capabilities to overcome a long-term hard physical activity in the extreme conditions of autonomous existence. The experiment was planned in a desert environment. Shatalova developed a technique of multi-kilometer hiking trips for this project. The participants of this experiment were her patients, who in the recent past had common chronic diseases, such as insulin-dependent diabetes, chronic hypertension not amenable to drug treatment, peptic ulcer of duodenal bulb, heavy pnelone-

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frit aggravated with drug allergies, liver cirrhosis, cancer of Vater papilla, and heart failure caused by obesity. This group included a 58-year-old conductor suffering from chronic hypertension. The head of the expedition was 75-year-old Shatalova. It's quite clear that the participants had previously been cured with the System of Natural Healing and restored to their real health.

It was supposed they would cover the route within 20 days, but the participants endured hard exercise in harsh environmental conditions so easily that managed to cover the distance within 16 days. The experimental results exceeded all expectations. Trip participants felt great, and not only kept the weight of their bodies, but also gained some weight, while consuming a minimum amount of food and water.

The findings of the unique series of experiments of 1983-1990

The System of Natural Healing and an integral part of it — the healing food — brings a person from a state of ill health into a state of a good health. The first state is a characteristic of the humans, spoiled by the sick modern civilization; the second is characteristic of a reasonable person, audient to the voice of nature and subjected to its regulations.

The results of her examination of representatives of both groups clearly indicate stunning differences between them. It turned out that for people, standing by unnatural modern diet, basal metabolic rate, i.e. energy consumption of the body in a state of rest, is more than 4 times higher than that of reasonable people: 1200-1700 and 250-450 kcal respectively. In the first group, the rhythm of breathing was 18-20 cycles (inhale and exhale) per minute; in the second group of 4-5. "Orthodox" person consumed almost 5 times more food than a reasonable human.

Shatalova stated further that these were the facts — the very facts that form the basis of any science, which is intended to explain any serious theory claiming for high academic rank. How do theorists of a balanced diet react to them? Nohow. To recognize and accept these facts means to

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admit failure of their own postulates. Refute? But how, if these facts are life itself, which incorporates a superhuman tension of athletic fight and icy peace of mountain tops.

That's the theory and practice of Russian neurosurgeon Galina Shatalova, who dismissed modern medical practice and came back to natural healing.

She died at the age of 95 in her house near Moscow. Her death was a peaceful death of a healthy woman at her normal biological age. Her son Yuri described her death as follows:

When he entered her room, she lay in bed fully conscious and doing breath exercises. He asked her how she was doing. She answered, "Doing well."

"Do you need anything?"

"Thank you, I am fine." Ten minutes later he discovered that she was dead.

Some people can argue, saying that 95 is not a very old age and there are examples of much longer life and that's why vegan diet and limits of calories intake do nothing to prolong life. The answer for this is as follows: every one of us has a personal biological life limit written in our genomes. There is no a way to extend this limit. But dying healthy? What might be better than that?

In 2005, I heard a talk by Academician Skulachev reporting his expectations of a limitless life using his antioxidant delivered right into cells, using phosphorus molecules as a train. He was full of hope and inspiration. Four years later he reported, after trials of his antioxidant with animals, that no life extension was achieved, though rats showed less signs of aging.

On the other hand, many scientific studies nowadays show that caloric restriction (reduced food intake without malnutrition) is one of the most successful approaches to prolonged lifespan. Shatalova understood this long ago and changed her lifestyle completely, choosing both rejection of animal food and remarkable (up to five times) caloric restriction.

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Her life is a good example of devotion and service to people. She was called to the Scientific Council of the Ministry of Health in 1980 to defend what they called “her unscientific methods” and to take away her doctoral license. This is what she said:

“We are studying the structure of the body, the structure of blood, neurons, and ribonucleic acids, and so on, oblivious of the fact that desires, thoughts, and emotions are also parts of our nature — this is our inner world. In each of us there is a taper of connection to the higher world. It's lighted, but do we see its light? Did you ever think about that? No? So the time has come. I wonder myself why I keep true love to my patients, coming in an unending stream? Love that makes my heart flutter with happiness. This is all about kindness. It is my inner cosmetics, promoting the proper setup of the body. I am glad to be doing my favorite deeds, which are very useful for people.”

I totally agree with this statement. I blindly followed the procedures of her System of Natural Healing, prompted by her love of nature and her heritage of ancient medicine. This allowed me to avoid modern monstrous methods of cancer treatment, such as "chemistry" and "radiation" that do more harm than good destroying our health while killing tumor cells. And yet, there are some questions in her theory that I prefer to analyze from the point of view of modern science.

III

Food as medicine.

"Let food be thy medicine".

Hippocrates

The major health problems for human beings are the results of eating, drinking, breathing and unhealthy lifestyle. If we stop consuming food we can avoid health problems, but survival also becomes questionable. Since we are unable to live without food, we must learn to eat wisely, so that it would not cause devastating health problems. The same holds true for water and air.

Nine years ago (in January 2005), when I became ill with pancreatic cancer, I chose to put complete trust in Galina Shatalova's advice and became a strict vegan, eating a limited amount of food (four to five pounds of fruits, veggies and boiled whole grains only) and using reverse osmosis water for cooking and brewing of herbal teas. I lost weight rapidly during the first three months, experiencing very bad symptoms of a damaged pancreas for about two months. At some point then everything slowly turned back to normal. After nine months I felt good again.

OK, but she did not provide a good explanation for the mechanism of this treatment, only saying that people are frugivorous, not carnivorous by nature, and that this method was widely used in the past. This sounded good, but I was curious about the reasoning behind it. This question was troubling my mind for a long time. Aside from Shatalova in Russia, I discovered that many American doctors of medicine also recommend the idea of vegan diet, curing the most deadly diseases like cancer, diabetes, heart disease and so on. Among them are Colin Campbell, Caldwell B. Esselstyn, John McDougall

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Free download from www.naturelaws.org/book and Neal Barnard, who organized Physicians Committee for Responsible Medicine, and others.

Collin Campbell conducted an important study of the relationship between the type of diet and cancer in China, published in his book "The China Study", which proves that consumption of animal food is conducive to cancer development. Caldwell Esselstyn also studied the influence of animal-based food on health, using statistics from the years of the German occupation in the 1930s. He also discovered that the increase of meat in the diet causes an increase of diseases like heart attacks and cancer.

If taken into account that heart diseases are caused mainly by excessive cholesterol clogging the blood vessels, what then might be the reason for cancer? Some speculations suggested that cancer was caused by viruses, or bacteria, or even fungi. One of these pathogenic groups would attack vital human organs (such as kidney, liver, pancreas, stomach and so on), changing the genomes in these organs, and turning them into rapidly developing malignant tumors, or making them unable to fulfill their functions.

The role of microbiome in the guts attracts attention of researchers more and more nowadays. In fact bacteria, viruses and fungi (which are considered to be a form between plants and animals) and other microorganisms were the first inhabitants on the earth. Their proliferation, genetic changes, collaboration and tenacity defined the development of life beginning four billion years ago without oxygen and three billions with oxygen in the atmosphere.

The human body is only one of their numerous habitats. And since inhabitants usually transform their dwellings, so the human body is also a subject for such transformations. It's impossible to get rid of microorganisms in the body without ruining the entire dwelling as well. Can we, however, regulate their proliferation by helping friendly symbiotic ones and suppressing the aggressive and pathogenic ones?

Early in 2013 I found information about Dr. Tullio Simoncini of Italy, who declared that the major causes of cancers are fungi. This speculation is also supported from other

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sources, claiming that many diseases, including AIDS, mono-nucleosis, cancer, stress, and nutrient deficiency are linked to candidiasis. In actuality, fungi are a natural part of the human body's oral and intestinal flora. Treatment with antibiotics can upset the balance and only aggravate the situation, leading to a disturbance of the natural competition for resources, and increasing the severity of conditions.

This information also supports speculation by Dr. Tullio Simoncini, who administered sodium bicarbonate to suppress cancer tumors and prevent cancer development. OK, but why choosing the sodium bicarbonate? There are many other natural choices of fight with fungi. Sodium bicarbonate works in our body, starting in the duodenum, to neutralize acidic content of meat digestion in the stomach. It is produced naturally in the pancreas according to the demands of chemical sensors in the duodenum, which signal the acidity of the contents coming from the stomach. It seems unclear at first, why should we administer it into the stomach where it can disrupt the natural process of digestion there.

Are there any other mechanisms at work here? For example, one very recent development consists of delivering hydrogen peroxide, directly into the cancer tumors, corrupting and suppressing it. It seems more natural, as far as hydrogen peroxide is used by the immune system in the process of phagocytosis against pathogenic viruses. In the early twentieth century, an injection of 0.03% hydrogen peroxide into the blood stream was successfully used against deadly diseases such as syphilis and the likes.

So how does it happen, that a vegan diet cures cancer? The main pathway for my train of thought was becoming more or less clear. If cancer is caused by fungi attacking major organs in the body, than fungi development can be suppressed by changing the acidity of the food. Fungi exist very well in a range of pH between 5.5 and 8.5. If the environment is either more acidic or alkaline, they parish. Hydrogen peroxide also kills fungi very well. There are other evidences that pathogenic fungi in the body do not survive if temperature is below 35°C (95F), or higher than 39°C (102.2F).

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Yet, it was not clear up to this point what strain of fungi could be responsible for my problems. There are about 64 thousand species of known fungi on earth. People use them for many purposes, including bread baking and vegetable fermentation. By a black coincidence, I got pathogenic fungi again, when eating food contaminated with a strain of it in late April, 2013. The reaction of my body was well known to me: severe diarrhea and my pancreas stopped working, leaving the food that I had eaten almost totally undigested. Insomnia and frustration completed the picture. This time I did not limit my treatment to a vegan diet only – I also used antifungal medicinals like turpentine and berberine.

Use of turpentine is a little bit controversial. It is considered that turpentine, even naturally derived from pine tree resin, is toxic and can harm the liver and kidneys. However I also learned that Gorillas consume remarkable amount of ants in their everyday life, which contain formic acid. Formic acid is also toxic, but it constitutes a part of their diet. People in Russian use Siberian cedar tree resin very commonly for many medical purposes, including ingesting it orally in the form of turpentine. So if taken for a short time, healing effect of turpentine exceeds toxic influence.

Attempting to recognize what type of fungi was responsible for my condition, I decided to analyze the content of my gut, and sent a sample of my feces to "Metametrix" laboratory – a unique laboratory in the US, doing analysis of human gut microbiome for patients, (which has since united with Genova Diagnostics). This is called the GI effect stool test.

Here's how they describe this test in the introduction: "Proper gastrointestinal (GI) function is critical to adequate nutritional status and can impact all aspects of body function. The GI EffectsSM Stool Profiles address key components of proper GI health including measurement of beneficial microbial flora, opportunistic bacteria, yeast, parasitic infection, markers of inflammation, immune function, and digestion and absorption. The microbial population is measured using PCR amplification of the genetic material of each organism, allowing for sensitive detection, and the ability to detect and iden-

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tify organisms that cannot be cultured or are extremely difficult to grow under laboratory conditions."

The results came in a month's time and confirmed my suspicion. Yes, there was an overwhelming amount of pathogenic fungus of unknown taxonomy in my gut. This fungus suppressed symbiotic bacteria and damaged my pancreas yet again. They did not specify what type of fungus it was, but the laboratory test results contained a list of pharmaceuticals and herbs that could kill this fungus. I dismissed pharmaceuticals but paid attention to the herbs. Among them there were: berberine (golden seal), caprylic acid (octanoic acid), carvacrol (oregano), quinic acid (cats claw), thymol (oil of thyme), and undecylenic acid (castor oil).

Moreover, the test results showed this fungus is resistant to garlic phytoncides, which was quite striking. Garlic is a powerful weapon against pathogenic bacteria. This prompted me to think that the strain of fungus in my gut might be genetically modified one.

In addition to confirming the idea of pathogenic fungi, this information armed me perfectly and I was ready to fight against this fungus.

In the full analysis of all this information regarding cancer development, I thought it might be interesting to measure the pH of food products with the aim of understanding their influence upon fungi and overall health. So at the first convenient moment I had access to a pH meter, I used it to measure the pH of food products from the nearest grocery store. I found the results of measurements amazing and present them in the attachment A.

This table shows that all food products in the vegan diet are acidic and many have a very low pH, which is mostly below 5.5 (the threshold for pathogenic fungi to perish). The most powerful tools against fungi are lemon (with pH = 2.5) and other citrus fruits, apples and grapes (pH=3.5). I immediately recollected that in Russia some practitioners prescribe grape based diet to cure cancer. Presumably, they create an unfriendly environment for fungi.

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This means that first of all, a vegan diet cleanses the gut of pathogens, changing the microbiome content to a healthy one. Additionally, acidic food supplies excessive protons in the form of hydronium ions (H_3O^+) to the intercellular liquid and blood plasma, and thus contributes to healthy metabolism processes.

What happens beyond this is not completely clear to me yet, and I would like to clarify this someday when I have the appropriate laboratory conditions for this, but my primary speculation is that a vegan diet creates an unfriendly environment for fungi.

The other mechanism is that a vegan diet decreases the amount of excessive calories that we consume. This also turns on the immune system to fight against pathogens. The immune system has a good weapon against pathogens – reactive oxygen species (ROS), the most powerful being hydrogen peroxide, which white blood cells use against unwonted invaders. But the observations by Dr. Galina Shatalova and Dr. Collin Campbell demonstrate that nothing helps in the case, if patients consume animal-based food. This weapon is probably powerless when eating an animal-based diet, due to excessive nutrients available for pathogens to proliferate in the body and the neutral pH of such diets. Meanwhile, a low pH diet works very well, helping neutrophils defend against bacterial or fungal infection in the blood, emitting excessive protons in the form of hydronium ions (H_3O^+). Now our body is armed and ready to fight!

It's also well known that a vegan diet is rich of antioxidants (such as ascorbic acid – vitamin C, and alfa-tocopherol acetate – vitamin E) and can balance apoptosis process. Apoptosis is the process of programmed cell death that takes place in all multicellular organisms. Billions of cells die each day due to apoptosis in the average human adult. For a healthy young person dead cells are replaced with new ones. This process of replacement remains unbalanced with aging due to multiple dysfunctional changes in our bodies, caused by an unhealthy lifestyle, environment and food. So balancing this process is very important even for healthy aging people.

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Furthermore, if we take into account the information obtained from these facts and consider the theory of fungus as the cause of cancer, it's the appropriate time to implement the vegan diet treatment along with other antifungal herbs and pharmaceuticals widely used nowadays. But I am not convinced it can help when meat and dairy products are consumed.

In any case the real results do not require much speculation, they speak for themselves. Nine years after the diagnosis, I live a very interesting life, full of energy, impressions and new ideas. Fructose from fruits gives energy to both body and brain (the brain usually suffers from energy deficiency on a diet with excess of lipids and low supply of carbs).

The modern approach to brain energy supply tells us that metabolism in the brain operates differently from metabolism in other parts of the body. The brain requires a remarkable amount of energy derived from the basal metabolism. In humans it comprises up to 20–25% of total metabolism. The brain typically gets most of its energy from the oxygen-dependent metabolism of a constant glucose supply, because neurons cannot store glucose. In addition, brain cells need two times more energy than other cells in the body, which is utilized mostly for the bioelectric signaling, responsible for communication throughout the nervous system.

That is why good blood circulation in the brain capillary network is very important. Food with excessive lipids can clog this capillary network, damaging normal functioning of the central control system of the body.

The major source of glucose in the food is in carbohydrates. Carbohydrates are mono- and disaccharides, starch and glycogen. The main monosaccharides are glucose and fructose. The main dietary disaccharides in human diet are sucrose and lactose.

Glucose and fructose may be directly absorbed in the intestine, and sucrose and lactose are hydrolyzed in the intestine; sucrose to glucose and fructose, and lactose to glucose and galactose.

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Starch and glycogen (animal starch) are first hydrolyzed to maltose, which is then broken down to glucose. As a result, we see that almost all carbohydrates give the body glucose – the main energy feedstock. The other sources of energy in the vegan diet are proteins and fatty acids derived mostly from grains, legumes and nuts.

Eating a vegan diet gave me an extra-endurance, which I'd never experienced before, when was on a carnivorous diet (though my speculation does not explain this effect). I exercise vigorously at very least twice a week. My preferences in exercises include tennis, swimming and mountain skiing.

Positive emotions are also very important, to my mind. Whenever I see a person with aggression, hatred and contempt toward other people as a dominating emotion, I always notice some health problems in that person. It doesn't matter much which causes what: aggression the disease, or disease the aggression, it's a good idea to break this vicious circle and bring the mood to the positive side. It may be that experiencing love for others is impossible for such a person, but mitigating hatred is certainly in his or her power. (We will discuss the topics of emotion influence following in the next chapters).

Coming back to my current health condition, I have successfully avoided any type of flu during these past nine years. The only health problem I have is excessive mucus in my nose, which caused some trouble during the night, and can be addressed very well with hard exercises. I noticed, too, that several drops of 0.3% hydrogen peroxide solution open my nasal passages for the whole night. Another way to do this is by spraying 3% hydrogen peroxide on the walls next to my bed, the evaporation of which cleans my nose and I am able to get a sound sleep. In all other respects I am healthy and ready to help other people in finding their road to a healthy lifestyle.

Reading and listening to many nutritionists in the US who all say which food is good and which bad but never mention quantity, I experience a mixture of disappointment and astonishment. Many questions keep running through my mind: how and from where have these people obtained all this infor-

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mation and how do they believe they know the real processes of nutrition and food transformation in the body? There is no way to observe the real processes of digestion that happens in the gut, beginning at the duodenum and ending with the colon. The study of separate human body organs do not give a complete picture of symbiotic coexistence of gut microbiome and the body.

These people have no a moral right to dismiss the myriad of microorganisms living inside the body. Each of them fulfils its duties while fighting for existence in the body and some of them even accomplish the work of the body's organs, providing a supply of essential amino and fatty acids.

Here and elsewhere in this book, I don't want to criticize anyone, but rather to try to attract attention to the fact that the real processes in the body are very complex. When we try to single out one effect and neglect many others, mistakes in the conclusions are inevitable. When people began to study biochemistry and the physiology of living tissue, the era of simple conclusions was in the past. Biophysics, biochemistry and physiology do not give us the convenience of a single process study – everything is interconnected. This is the reality of life which we must recognize.

The prevailing ideology concerning essential nutrition, without which a man cannot survive, is to consume animal protein. The basis for this idea is pretty simple: plant based diet allegedly does not contain 8 amino acids the body needs for healthy formation, and this is why it is essential to get these amino-acids from meat which already contains them. However, it's necessary to take into account that animal protein goes through a complex process of decomposition (deamination) during digestion producing ammonia that is toxic for the body, and especially for the brain.

Normally, the ammonia concentration in the body does not exceed 1 – 2 mg/liter. If concentration of the ammonia jumps up to 50 mg/l, death can occur. Ammonia causes severe toxicity, particularly in the liver. High ammonia toxicity can be explained due to the ease of its penetrating through the membrane and right into the cells where it attaches itself to the

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hydronium ions, thereby reducing the concentration of these ions in different compartments of the cells, which ultimately affects the activity of the cells.

The speculation about the necessity of animal protein also immediately raises the simplest question: how do herbivorous animals build their bodies without animal protein? Is there anything special in the organs of digestion that can synthesize these amino-acids? Yes, this special ingredient is evidently their microbiome, which can synthesize essential amino-acids. The same thing can happen in the human body too. So it's quite possible to say that "animals" that can build up animal protein using carbohydrates, live inside our intestines. If we consolidate the nutrition that fruits, veggies, legumes, grains and nuts give us, and take into account the work of symbiotic bacteria, it's quite possible to say that a vegan diet is a good source of healthy nutrition.

Moreover, an excessive supply of nutrients can and does cause damage to the body's health, beginning with blood vessels clogging from excessive cholesterol and ending up with diabetes and cancer. There is much evidences of this harmful action of excessive nutrients and yet nutritionists blindly insist how important it is to have an additional supply of "essential" fatty acids and animal proteins.

Meanwhile natural vegan food contains all necessary minerals, proteins and fatty acids and is quite sufficient to support good health on the condition that it is organically grown, diversified and not genetically modified. Symbiotic bacteria in the gut accomplish the work of an imperfect human digestive system. Moreover, even vegan food is good only if the quantity does not exceed the amount necessary to maintain a good healthy weight that supports mobility and endurance.

Quite often, excessive nutrition is unhealthy even for people who consider themselves not obese or even overweight, due to the fact that the recommended healthy weight range has been artificially shifted up. People with a body mass index in the accepted range can develop malignant diseases if their food is not healthy and is in excessive quantity.

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For example: "Abnormalities in insulin action may be involved in the pathogenesis of nonalcoholic fatty liver disease (NAFLD), a condition that ranges from clinically benign fatty liver to its more severe form, nonalcoholic steatohepatitis (NASH)." ("Insulin resistance: A metabolic pathway to chronic liver disease" Elisabetta Bugianesi¹, Arthur J. McCullough², Giulio Marchesini).

It's important to note that fatty liver does not only accompany obesity and can be found in a person whose weight is within the proper body mass index. Everything depends on the type of food taken. Shakespeare said: "Don't be gluttonous. Remember that the grave for you will open three times wider" ("Henry IV"). The fact that there is no foodie on the longevity list throughout the whole history of human society just supports this quote.

The major rule here: don't eat to satiety when at the table; a man stops eating not when he stands up from the dinner table, but 4-6 hours afterwards. This rule makes digestion efficient enough to support full-blooded flush life.

Let's consider how a man "as full as a tick" feels: nothing, except a heavy hard belly. No thoughts in the head, no wish to move or speak, no emotions. Even breath is hampered. Eyes are heavy and drowsy. And all this due to the fact that blood flow suffuses the stomach and is restricted in the head.

In addition, a very important issue here is how the food is processed during consumption. Galina Shatalova drew attention to the importance of good chewing, saying that every bite of food should be chewed at least fifty times. Without following this rule strictly, I support the idea of it due to the fact that saliva contains enzymes, important for efficient digestion, and that while chewing, we mix our food with these enzymes. As Gandhi said: "Drink what you eat, and eat what your drink".

The reader learned in chapter II about Galina Shatalova and her System of Natural Healing, and that caloric restriction and a vegan diet cures major diseases caused mostly by an excessive supply of nutrients. There are numerous other observations in biologic and medical journals evidencing that ca-

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loric restriction is a major and necessary factor for a long, active, healthy life.

What is very important, as noted from the observations of Italian biologists in "Nutrient availability links mitochondria, apoptosis, and obesity" by Francesca Pintus, Giovanni Floris, and Alessandro Rufini: "Caloric restriction (reduced food intake without malnutrition), is regarded as one of the most successful approaches to prolong lifespan. From *C. elegans* to mice and primates, reduced food intake improves survival and delays age-associated decline, compared to ad libitum (satiety) feeding. Caloric restriction also reduces accumulation of senescent cells in mice".

They also noticed that "animals' natural food intake is probably nearer to a regimen of caloric restriction rather than to ad libitum. In this regard, since mitochondria evolved to coordinate energy production with food availability, their optimum performance coincides with caloric restriction, whereas excess of food intake will compromise mitochondrial energetic capacity..."

One such speculation I have heard is that there are people with different types of metabolism and that some should avoid grains and need animal proteins only. What possible basis could there be for such a statement? The metabolic pathway is the same for all animals, including people. That is the metabolism that happens in the body's cells. The difference between animal species is only their digestive systems and physiologic structure. This serves as the basis for using animals as a prototype for human species in different medical and biological studies.

What might happen to people if their particular type of food, according to this division on nutrition types, becomes inaccessible to them? Would they die? Nothing of the kind – they simply get accustomed to other types of food and even may feel that this new food is tastier and healthier. As Dr. Neal Barnard noticed in his workshop "Chocolate, Cheese, Meat, and Sugar – Physically Addictive", it takes about three weeks to get accustomed to a new type of food. After such period of time, an old type of food may seem vapid. And quite

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often this can improve the person's health conditions if they were accustomed to an unhealthy type of food, and had considered it tasty, natural and the most nutritious for them.

Galina Shatalova cured hundreds, if not thousands of such people. One of the cases, a patient with insulin dependent diabetes, is described in the chapter II, which covers her method. This patient considered himself as having animal protein type metabolism person. Shatalova replaced his meat dependent diet with a vegan diet, and insisted he exert and train his lazy body. The result was a healthy person. The same thing happened to her other patients. I met some of them and they were healthy and happy with their new diet and way of living.

A much more productive approach to this question is an analysis of the gut microbiome content. The differences in microorganisms living inside us can provide a good picture of digestion efficiency. But content of microbiome can change, depending on the food we consume. Deprived of the type of food they require, some microorganisms will vacate the space so that others, that are accustomed to the type of food supplied, can take their place.

A very interesting project by the name American Gut was recently launched in the US by two Universities: Biofrontiers Institute at the University of Colorado-Boulder and the Earth Microbiome Project at the University of Chicago

Here's how they describe the project: "This project provides anyone who joins with a list of the bacteria in a sample (genus level where possible) – and relative abundance – and show you how your bacterial community compares to others in the study based on the diet and lifestyle questionnaire". One can join this project at <http://humanfoodproject.com/americangut/>

It could become even more interesting if the comparison could be extended to bacterial communities (microbiomes) from people with long lifespans in other areas of the world, especially ones living a natural lifestyle, uncontaminated by pharmaceuticals or pesticides.

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Nine years of my life without a single bit of animal product or animal proteins and fats proved that the microorganisms in my gut can accomplish the work for my imperfect organs of digestion and supply me with essential amino and fatty acids that I don't get in my food. What are they? I don't know, but it would be good to understand it someday. I have also noticed over the course of this time that even consumption of concentrated vegetable oils is also harmful for my health conditions.

In 2013, after experiencing a remarkable weight loss due to the pathogenic fungus infection, I decided to add to my vegan diet some sesame oil from Japan. This oil was pleasantly enhancing the taste of my vegetable salads, but in two to three months I discovered a noticeable accumulation of fat (up to 1" on the small of the back) under the skin. My weight was increasing rapidly together with the loss of endurance and did not stop until I quit having this oil.

Nuts and whole grains in their natural states are good sources of fatty acids. For example, walnuts contain a high amount of $\omega 3$ oil; almonds are a good source of boron, which is essential to suppress inflammation in the body that develops with age. One tenth of a pound of nuts, like almond, walnuts or hazelnuts a day, is quite enough to satisfy all my need for fats. Sometimes I have coconut, but in its their natural state, which provides me everything: coconut water, meat and butter. Besides nuts, legumes and grains are a good source of proteins. I don't see any necessity in refined oils and do very well without them.

I disagree with those who say that grains may be harmful for health. There is a vast difference between processed grain and whole grain. Processed grain, which is widely used nowadays, loses its most valuable property as a source of minerals when it is hulled and polished, due to the fact that it's the upper surface of the grain that contains the minerals. So, when you buy white polished rice, you buy a source of carbs and plant proteins, but it contains no minerals. The same thing happens with wheat flour, which loses not only minerals in the upper layer, but also the most balanced pro-

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teins in the germ. It's much better to buy whole wheat and grind it instead.

The other thing worth considering is use of wheat as bread. Mass production simplified bread making technology and added many unnecessary ingredients with the aim to make it more nutritious and extract more profit from it. The simplest bread known from history is Jewish matzoth, which contains nothing except ground whole wheat and water. This is the healthiest type of bread.

People discovered yeasts growing naturally in the dough within several days and began production of soft bread. The major role of yeasts in the bread making process is the conversion of fermentable sugars present in the dough into carbon dioxide and ethanol. Modern technology does not use natural live yeast, growing in the dough, replacing it with instant yeast made by Lesaffre in the 1970s.

And the last unhealthy step was the addition of butter, refined sugar and other sweeteners to the bread. This led to the development of fermentation processes in the gut, constipations and appearance of unhealthy bacteria, which are especially dangerous when east based bread is mixed with meat. Anaerobic bacteria, developing in the gut in this mixture, produces hydrogen sulfide, which is toxic for the body's organs and especially for the liver and nervous system.

A quarter of a pound a day of whole wheat, red rice or millet is a good source of proteins and minerals. Boiled amaranth is also very tasty and nutritious. I like whole wheat and rye very much for their unbeatable taste, but prefer to have them sprouted rather than cooked. Boiling hard red wheat or rye is a long process and takes more than an hour and a half. But adding one tenth of a pound of sprouted uncooked wheat to my lunch smoothie of apple and nuts gives me good energy for the whole day. Besides, sprouted wheat is a good source of vitamin E.

It's necessary to note, however, that wheat is not an easily digestible food and requires some specific bacteria to accomplish the work successfully. People who don't have such bacteria in the guts can feel bloating with an unpleasant smell.

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I noticed that having some organic lemon juice helps to complete the digestion work very well.

For those, who don't know, grain sprouting process is very easy, using this glass jar with stainless mesh top.

The process can be described as follows:

Put a desirable amount of hard red wheat into the sprouting jar and rinse it thoroughly.

Fill the jar with the reverse osmosis or distilled water to cover wheat grains twice.



Place the jar in the fridge or other cool place for a day and overnight. The next morning, rinse the grains and remove excess water from the jar, leaving grains wet but not flooded.

Rinse the grains thoroughly every day to avoid mold, which can grow if it is abandoned for more than one day. Four to five days is enough time to sprout wheat or rye.

Why are sprouted grains better? In general, the wheat grains contain about 1 mg of vitamin E per 100 g of wheat. But wheat germ contains approximately 15 times more. During the process of grains sprouting, the quantity of these vitamins in the germs increases nearly 5 fold. However, when glucose is produced in the process of photo-synthesis, hydrolysis of starch and fat stops, and at the same time, the content of vitamin C and vitamin E in the germs greatly decreases. Therefore, the grains sprouted in the dark are more useful when they have maximum amounts of these vitamins.

The exact biological function of vitamin E is not clear yet. It is assumed in particular that it is involved in protecting the cell membrane lipids from oxidation, i.e. it is an antioxidant. But it performs this function using the hydronium ion (H_3O^+), which it delivers into the environment in which it is located. Therefore, vitamin E is able to acidify fats, and thus accelerate the hydrolysis of fats. To obtain fatty acids from the fats, the latter should be hydrolyzed, like starch. But for the activation of enzymes that hydrolyze fats, an acidic envi-

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ronment is needed. Vitamin E is not only fat-soluble vitamin, but also a substance that makes the environment more acidic.

Some nutritionists equate refined sugars and grains. I don't see any ground for such equalization. If they are consumed together, it causes yeast proliferation and oxidative fermentation processes and bloating in the guts. The best way to avoid this is complete elimination of refined sugar from the diet. Aside from carbs, unprocessed grains contain a remarkable amount of minerals in their upper layer, which is essential for metabolic processes. It's better to have whole grains instead of taking heaps of pills with minerals in an unnatural refined form.

Furthermore, I often hear that it's only carbs that feed cancer cells, but animal proteins do not do this. This statement puzzles me. Otto Weinberg derived this conclusion from his laboratory in vitro experiments in 1930s and did not take into account all the complexity of metabolic processes in the body. Since that ancient time this odd statement has remained unchanged and unanalyzed. I was having only carbs with plant proteins during all these nine years and managed to remove all the cancer cells from my body completely within the first nine months.

I once read an account of a "scientific" observation in which the authors attempted to prove that an animal protein based diet can halt cancerous tumor growth. They referenced a number of studies, dating back from 1913, where such a diet was tested in experiments with rats, however I wasn't able to find a single result where a tumor was completely eradicated from the body of any rat in the study. There were a few reports claiming that 30% reduction of the tumor size was achieved. That was the highest result, with many others reports showing no results at all!

It is believed by some that the fructose in fruits is harmful for health and is the reason why it is recommended to avoid consuming fruit. I eat at list two pounds of sweet apples every day and feel that energy is entering my brain with each one. This effect can be explained by the fact that there are three major sources for the cell mitochondria to produce ATP:

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glucose, proteins and lipids. The main biological function of lipids includes storing energy, signaling and acting as structural components of cell membranes.

Fats produce twice as much of specific energy as glucose does, but they must pass a long metabolic path before ATP production in the mitochondria. The first stage of fatty acid catabolism is Beta-Oxidation. The second stage is of acetyl CoA oxidation to carbon dioxide. The third stage is electron transfer from electron carriers to the electron transfer chain.

In the mitochondria the process of the fatty acids transformation into ATP is also very complex. The breakdown of fatty acids and the deamination of amino acids produce so called ketone bodies. A pathological metabolic state features an extreme and uncontrolled ketosis. When the body fails to adequately regulate ketone production, it may cause an accumulation of keto-acids that drops the pH of the blood. In extreme cases ketoacidosis can be fatal, which can happen to type I diabetics.

Besides, we should take into account that food is not the only source of an energy supply to the body. Sunlight is also a very powerful source. Every square meter (eleven square feet) on the earth's surface can harvest about 750 Watts of energy from the sunlight. Taking this energy into account, the amount of food consumed can be reduced. This explains why Shatalova and her companions were hiking in the deserts with a minimal amount of food (1/4 pound of buckwheat and 1/4 pound of dried fruits a day).

But even without direct sunshine, high temperature is also a source of energy in the form of intensive infrared light, therefore the amount of food in the summertime can be greatly reduced.

Industrial ways of food production are the cause of unhealthy food, contaminated with chemicals and harmful for body organs and gut microbiome. Trying to preserve food for storage and shelf-life, the food industry invented preservatives which are harmful for microorganisms, disregarding symbiotic ones in our body, which also suffer. In the pursuit to

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gain ever bigger harvests, people invented the most sophisticated and harmful pesticides, without thinking how these pesticides influence human health, wild habitats and the environment.

Developments of such pesticides have caused the massive disappearance of bees in the US. Bees did not die, they disappeared. Investigation, initiated by beekeepers, came to the conclusion that bees left their beehives due to permanent pesticides, used to preserve the crop. But, it's evident that such permanent pesticides are harmful not only for the bees, but for other friendly bugs, animals and humans, damaging their organs and gut microbiome too.

The next step in food technology development was the invention of genetically modified food. Genetic engineers designed plants resistant to pests. They achieved this goal by installing proteins, derived from bacteria into plant genomes such as transgenic potato plants that produce the endotoxin of *Bacillus thuringiensis* var. *tenebrionis* (Btt). Thus insecticidal endotoxins became an intrinsic feature of GM plants. Pests that try to eat these plants suffer severe damage of their digestive tract and perish. Genius inventions! But is it only pests that consume these plants? How about people and cattle? Should they eat such plants too? And what happens to the digestive tracts of those people who, due to lack of information (GM food is not labeled) carelessly or unintentionally eat such food?

Another approach of genetic modification in plants is the installation of proteins that resist herbicides. This feature allows usage of herbicides without damaging the modified plant while killing surrounding weeds.

"Herbicide tolerance (HT) is one of two basic traits common to nearly all GM crops. About 71% of the crops are engineered to resist herbicide, including Liberty (glufosinate ammonium) and Roundup (glyphosate). About 18% produce their own pesticide. And 11% do both. The four major GM crops are soy, corn, cotton and canola, all of which have approved Liberty- and Roundup-tolerant varieties". ("Genetical-

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ly Engineered Crops May Produce Herbicide Inside Our Intestines" by Jeffrey M. Smith).

Fantastic invention! No labor is needed to get rid of the weeds. So what is the final result? Those GM crops that withstand herbicides can and are exposed to a remarkable amount of herbicides with no sign of damage. But when exposed to an increased amount of herbicides these plants can and do accumulate them in increased amounts.

According to a statement by the inventors: these plants are not harmful for people. OK. But how was this verified? The tests were short and indirect. Rats were fed with these plants for ninety days and no harm to their health was noticed. Awesome! But! Such tests raise many questions. Normal lifespan for a rat is two years. What happens to the rats in the test after ninety days? What happens to them if they are fed with GM food for two years? People are not rats! What happens to their digestive tracts, which represents a complex symbiosis of microorganisms with the body? What happens to symbiotic bacteria in the guts? Did anyone check this? NO.

Such an approach cannot be considered as scientifically sound or even humane. This question is disturbing to many people.

Let's complete the chapter about food as medicine with the idea proclaimed long ago by the American doctor Jarvis: "Created by the very nature, food which is low in protein and rich in carbohydrates, helps to create an optimistic mood in the body. It predisposes one to the peace and quiet of the mind, and allows the body to create reserves of nutrients that may be used when necessary.

When a person acts contrary to the laws of nature, subject only to his own whims or desires, and consumes much protein instead of carbohydrates, he contributes to the creation of a pessimistic body, predisposing it to defeat".

That is the story and the observations of a pancreatic cancer patient, which I hope might interest healthcare professionals as well as people with cancer tumors. The most important feature of this observation is that a conscious human being – myself – was the subject of the study this time; one

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that can give accurate feedback with words, describing his feelings and state of health and choosing conscious rational steps of the healing process.

I don't give any intrusive food receipts, as many people do, as far as I believe that approach to food and nutrition should be individual and depends on many social, age-specific and geographic factors. There is no standardized diet that can fit all human beings simultaneously. The major guideline that I myself follow and advise for others: when you face a serious problems with health, try to follow the primary rules of the System of Natural Healing, developed by Galina Shatalova, that she practiced for about forty years with very positive results.

Spiritual health holds first place here, in healing the body. Make your life productive for the benefit of your community. Concern for humanity and love of nature and animals can help to transition you to a strict vegan raw food diet, rich in organic amino-acids, and limited in food quantity.

A natural food, vegan diet with caloric restriction is the second friend for modern human beings, which will help the body to turn on its personal immune system to fight against pathogens and properly fulfil daily work. Excessive nutrition always causes obesity and ill health.

Nowadays people search to find the causes for their health problems but many of them studiously avoid the major one – overnutrition. If one can curb a greedy appetite and combat laziness, then good health and happiness will eventually come back.

Intensive exercise and organism hardening makes our body strong and durable. The other alternative is a miserable unhealthy life or painful death at worst. It's your choice.

The water that we drink

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IV

The Water That We Drink

Coming from the water, all living creatures contain water in different proportions (up to 99% for jellyfish) of the body mass. Human beings change proportion of water in the body from 95% at birth to 85% with aging. Human blood contains about 90% of water. The average adult person consumes 2-3 quarts of water in different forms every day. Part of this water is taken from veggies and fruits, another part from tea, coffee and other beverages, and the rest in the pure form.

What kind of water shall we use in everyday life?

I was very curious why Shatalova recommended drinking distilled water only. She said that water is very important and helps cancer treatment. This statement puzzled me. Besides, water has been one of my major points of interest since 2000.

In 2010, attracted by the fact that distilled water and water processed with reverse osmosis have low pH, I set up a series of experiments with water distillation. These experiments are described in my manuscript (see Attachment B).

Professor Martin Chaplin, of London South Bank University, read the manuscript and offered helpful remarks, which helped me make this manuscript more logical. I know Professor Chaplin as a leading researcher in the science of water and greatly appreciate his attention.

To simplify publication procedures, I have placed the manuscript on the pages of my website: www.naturelaws.org/observ.pdf.

The major conclusion of these experiments is that distilled and waters filtered with reverse osmosis, are considerably enriched with protons because of their high mobility in water. Distillation and filtration, including the underground filtration (which does not saturate water with calcium and other alkaline salts), enrich the water with hydronium ions, making

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it acidic. Rainwater also has analogous properties because it can be considered distilled.

This happens because some molecules in water are always naturally dissociated and form hydroxide anion HO^- and hydronium cation H_3O^+ . This may be due to influence of background radioactive radiation and C-range of UV light. Dissociation of water molecules is also caused by mineral ions in water. Besides, CO_2 dissolved in water, also forms hydronium ions. Excessive proton in the hydronium ion jumps from one water molecule to a neighboring one because of its lower covalent bonding energy (Grotthuss mechanism, known for more than two hundred years).

When the temperature rises, the number of dissociated molecules increases, and in the process of evaporation, excessive protons leave water easier than other molecules due to their relatively small mass and high mobility in water. Excessive protons form hydronium ions (H_3O^+) in vapor make it positively charged, leaving residual water with excessive anions HO^- and HCO_3^- . The same process happens during reverse osmosis filtration.

It is a very wide-spread idea in the scientific world and elsewhere that the influence of CO_2 on water pH level — lowering it and making it acidic — is the major process in nature that changes water pH level. The experiments described in the publication show that influence of CO_2 is very limited, and the major role belongs to the high mobility of protons in the water.

Remember that content of CO_2 in the air is about 0.03%, and that only 1% of the dissolved CO_2 can form hydronium ions and HCO_3^- . This speculation is supported by the fact that residual water during the distillation and RO filtration processes becomes remarkably alkaline, which means a shortage of protons, and the presence of CO_2 does not prevent this. This should mean that some protons left residual water during the evaporation process and turned into vapor. This conclusion creates many consequences.

First, vapor coming from the Earth surface is positively charged with protons, one of the reasons why clouds bear

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huge positive charges, making a remarkable potential difference between the Earth and the clouds. One more reason is the protons coming from the Sun and from Outer Space; they also stick in the clouds, while electrons go through all the way to the Earth.

Protons play a remarkably important role in the cellular metabolism processes, forming a potential gradient on the inner membranes of mitochondria. The internal membrane in the mitochondrion is impermeable to most solutes and ions, a property that allows complexes of the ETC to build up the proton gradient required for oxidative phosphorylation. Evidently there are other major sources of protons, but excessive protons in water contribute to this process too, making energy exchange more efficient in the cells.

Healthy human skin maintains a low pH level (5.0–5.5) on its surface. This important feature prevents penetration of pathogenic bacteria, fungi, and viruses into the body through the skin and is probably achieved by acidic sweat generated in the sweat glands. However, the body excretes a remarkable amount of sweat, especially in the hot summer time. That's why replenishment of hydronium ions is so important to maintain healthy homeostasis of the body. That's why drinking acidic water is crucial for this process.

Moreover, studies of the apoptosis process by biochemists at the University of Berkeley (California) show that protons should contribute to the regulation of apoptosis, which defines the mechanism of the body aging.

In the course of biology development, people recognized such important substances as Reactive Oxygen Species (ROS), which are chemically reactive molecules containing oxygen. They include oxygen ions and peroxides. ROS are formed as a natural byproduct of the normal metabolism of oxygen, and hold important roles in cell signaling and homeostasis.

The major feature of ROS is their high reactivity, which exceeds oxygen reactivity and may damage cells. Normally, cells defend themselves against ROS damage with enzymes such as superoxide dismutase, catalase, lacto-peroxidase,

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glutathione peroxidase, and peroxiredoxin. Small molecule antioxidants, such as ascorbic acid (vitamin C), tocopherol (vitamin E), uric acid, and glutathione, also play important roles as cellular antioxidants.

Superoxide O_2^- is one of the ROS, which can be neutralized by superoxide dismutase, the enzyme that catalyzes reaction:



As we can see, protons are involved in this reaction and thus play a remarkable role in antioxidant defense. Incidentally, antioxidants, such as ascorbic acid (vitamin C), tocopherol (vitamin E), uric acid, and glutathione, also neutralize free radicals involving protons, thus making the stable molecules of radicals.

This just supports the idea that highly protonated water (rich of hydronium ions) remarkably contributes to healthy longevity.

Chemist Nikolay Druzyak (Ukraine) devoted a remarkable amount of time to his research, attempting to find the reasons for longevity of human life in some regions of the former USSR. After fourteen years of analysis of different factors, he reached a conclusion that the major factor that influences longevity is the content of the water that people drink and use for cooking. He writes in his book *How to Prolong Transient Life* that in Abkhazia, Dagestan, Nagorny Karabakh (and later up in Yakutia) and in the parts of the Northern Caucasus and the Nakhichevan Republic — generally wherever there were a lot of long-lived people, natural water had one common sign: it was soft.

This means that the content of calcium ions in the water fits into a very narrow range — from 8 to 20 mg/l. In places where the calcium content was less or more of the interval cited above, the number of long-living residents declined dramatically, although the component of long life shows up everywhere. Thus natural water with very little calcium contributes to the longevity in the above-mentioned geographical areas.

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Further Druziak attacks the norms of calcium intake adopted in some developed countries, saying that in Europe and North America, the calcium intake norm is adopted as 1,200 mg per day for children and 800 mg for adults, where the population receives 70–90% of the calcium with dairy products. In Italy and Argentina, the norm is considered at 650 mg of calcium per day for adults. And there too, 50–70% of the calcium comes from dairy products. In Japan, India, Chile, South Africa, and Turkey, the norm is of 300–350 mg of calcium per day, and they have few dairy products; the entire calcium content comes with cereals, vegetables, fruits, and meat. Druziak points out the case of Japan, where the average life expectancy is 81.4 years for women and 75.6 years for men, indicating that calcium counts for many long lives.

He writes further that most of the body's calcium is concentrated in the bones (99%) and only about 1% of it in the blood and tissues. Usually the calcium content in the blood serum reaches 8.5–12 mg per 100 g of blood, except in areas of longevity, where it does not exceed 5 mg. He explains that lowering the content of calcium in the blood is accompanied by a decrease of irritability of the central nervous system. Conversely, one of reasons for hyperexcitability and bad temper in some people may be high levels of calcium in their blood.

How does it happen that the high content of calcium might contribute to development of an unhealthy balance in the body? Druzyak describes the mechanism as invasion of calcium ions into a carbonate buffering system of the blood. As we know, presence of CO_2 in the blood forms H_2CO_3 . The carbon dioxide–carbonic acid equilibrium is catalyzed by the enzyme carbonic anhydrase: $\text{H}_2\text{O} + \text{CO}_2 \rightleftharpoons \text{H}_2\text{CO}_3$; the carbonic acid–bicarbonate equilibrium is simple proton dissociation/association and needs no catalyst: $\text{H}_2\text{CO}_3 \rightleftharpoons \text{H}^+ + \text{HCO}_3^-$.

When calcium is present in the blood, it forms poorly soluble calcium carbonate (CaCO_3) in blood vessels. It is known that arteriosclerosis occurs through calcification of the media. The lumen of the vessel may be obliterated or markedly narrowed. Medial calcific sclerosis is seen mostly in the

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elderly, commonly in arteries of the extremities — not a very good investment into our health.

The major sources of calcium for our body are water with high calcium content and dairy products. But besides contamination of arteries, calcium also remarkably reduces content of hydronium ions in the blood.

The skin pH is maintained at 5.0–5.5 in order to protect it from invasion of pathogens, which is most likely done using the same hydronium ions in sweat. Therefore, consumption is great because of the very large area of the skin. To maintain a healthy working skin, humans should drink water rich in hydronium ions and eat food with a high content of organic acids, that is, fruits and veggies. Water rich in hydronium ions include distilled water, reverse osmosis water, and rain-snow water.

Regrettably there is an unhealthy habit of chlorinating water in the city water supply systems with the aim to prevent development and proliferation of pathogenic microorganisms and disease transmission. Many people notice an unhealthy influence of such water consumption but this unhealthy habit prevails in spite of the fact that there are many other much healthier and natural ways to rid water of pathogens. These methods include UV light exposure, microfiltration and filtration using silver ions, water ozonation, and use of weak H_2O_2 solutions.

The same habit of water chlorination prevails in the swimming pools. Such water has a pH higher than 8.5, which disrupts the natural balance of healthy skin and leads to damage and death of skin cells. Besides, it leads to penetration of chlorine into the body through the skin, which also disturbs normal balance of chlorine in the body and cannot be considered healthy. Regrettably this unhealthy tradition prevails and nobody wants to switch to simple and inexpensive approaches, though many people dislike swimming in chlorinated water and notice its unhealthy influence.

Also to be considered, some vegan food requires cooking at high temperatures, such as boiling. The water boiling

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process always increases its pH, because the protons leave water with vapor, forming residual water alkaline.

That's why use of steam-cookers makes the process of cooking healthier by enriching the food with hydronium ions, coming from the steam. This simple steam-cooker is a widely used inexpensive cookware that makes cooking process healthier and tastier.



That's the water story. It is all a mystery to me how intuition provided this information to Shatalova. But somehow she instinctively chose distilled water and, I believe, she did it using the experience accumulated by people throughout all of history.

V

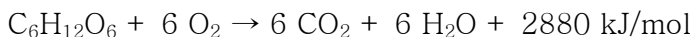
The Air We Breath

*All health problems begin
with an unhealthy mind*

Though this chapter falls in fifth place, the importance of the subject discussed hereinafter should be placed ahead of the previous two: food and water. My organization noticed that food and water draw the attention of the public. Nevertheless, the influence of air and the meaning of the respiratory system for health are many times more important. Air also plays a crucial role in the major subject of our discussion — cancer development mechanism.

We rarely notice our breath, but an overwhelming majority of animals living on earth, including humans, are oxygen-dependent creatures. Oxygen is the third most abundant element (by mass) in the universe (after hydrogen and helium), and is product of nuclear fusion reactions. Oxygen is the most abundant element in the Earth's crust as part of oxide compounds, such as silicon dioxide. In the Earth's atmosphere, oxygen appears in the process of the photosynthesis reaction in plants and has become a major participant of energy supply for aerobic organisms.

The reaction for aerobic respiration is essentially the reverse of photosynthesis and can be simplified as:



This reaction of glucose oxidation takes place in mitochondria to generate adenosine triphosphate (ATP – main energy transfer molecule) during the process known as cellular respiration. Moreover, the system of oxygen delivery to the body cells is very sophisticated and contains two major chains: respiratory and blood systems.

If the supply of oxygen stops, the aerobic organisms perish quickly. Very well-trained people can hold the breath

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for about five minutes. With ordinary people, when breathing stops for not more than two minutes, suffocation occurs. Normally, a healthy person breathes in and out twelve times a minute. However, this depends on the content of the air and the state of the tightly entwined respiratory and cardiovascular systems.

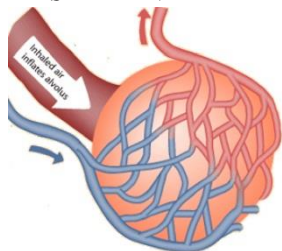
The state of the respiratory system, functioning as the major gateway for the oxygen intake, is very important for healthy living. We concentrate attention first on the lungs functioning; however it only seems that the upper part of the system, the nose, is not very complex, although it has some intricate features.

The whole respiratory system is a branching-tree-like structure. The lung is the essential respiration organ in many air-breathing animals, a few fish, and a few snails. Normal human lung physiology is very complex.

The anatomy of lungs can be briefly described as follows: The lungs have a soft, sponge-like texture, with a much larger surface area in total than its outer surface area. The trachea divides into the two main bronchi that enter the roots of the lungs. The bronchi continue to divide within the lung and, after multiple divisions, give rise to about 130,000 respiratory bronchioles.

The respiratory bronchiole subdivides into several alveolar ducts. There are approximately 100 alveolar sacs at the end of each duct, each containing 20 to 30 alveoli that are 200 to 300 microns in diameter (about 300 million per lung).

Gas exchange occurs only in alveoli. Alveoli are made of thin walls, typically one-cell thick, called the epithelium. The process of inhalation must inflate the alveoli, but it can only do so because of the presence of a surfactant fluid that coats the alveoli and lowers the surface tension of their walls.



Alveoli are surrounded by capillaries of the blood circulatory system. The surface area of alveoli in the lungs is approximately 75 m^2 . A normal inspiratory breath in an adult contains about 500ml of air.

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Oxygen from the air easily passes through a healthy respiratory system and is delivered into the cardiovascular system. Gas exchange occurs by diffusion through alveolar and capillary membranes, which are both one-cell thick, and is defined by partial gas pressure (or gas concentration) on both sides. Blood coming from the body cells is deoxygenated and rich of CO_2 . The efficiency of exchange depends also on the oxygen affinity to hemoglobin in the erythrocytes, which is described by the Bohr Effect, discussed in the next chapter.

In a resting human, the average erythrocyte spends about 0.75 seconds within the alveolar capillaries, and is fully oxygenated in about a third of this time. During intensive exercise the blood flow intensifies and the erythrocyte passes through the capillary in 0.25 seconds. This makes it necessary to have undisturbed alveolar walls, or oxygen saturation may drop with exercise. The oxygen-enriched blood returns into circulation and delivers oxygen to all the cells of the body.

This slick description above gives only a block diagram, which does not describe the entire mechanism of the gas exchange process. It's a very complex system of delivery of the major metabolic reaction participant — oxygen — into mitochondria, where the energy generation occurs. As in every complex system, it is vulnerable in spite of an intricate immune system, whose major aim is to defend the body from destruction and preserve a proper functioning for a biologically defined period of life.

In case some part of the respiratory-cardiovascular chain fails to fulfill its duties properly, the body suffers oxygen deficiency, which may lead to hypoxia, premature death of cells and development of many types of disease. Normally all animals, except human beings, fulfill all the processes defined by nature for a healthy life. Human beings however have an advantage in the brain development process, which provides an additional ability to suppress the surrounding animal world and use other animals for everyday purposes, such as food and labor.

This was more or less beneficial for people until the

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twentieth century. The twentieth century brought a significant jump in technology development, which people used remarkably to destroy nature around their habitats; they changed their lifestyle to an unnatural form while extracting some useful features from the new technologies. One of the components of nature that suffers very much is air, which in many instances is polluted to the extent that it becomes a danger to health.

Examples are multiple, beginning with ground dust and the many other dusts, such as industrial coal dust, sawdust, and cement, and ending up with chemical fumes and mortal gases like carbon monoxide and chlorine.

One of the problems for the lungs in inhaling dust-laden air is with the size of the dust particles compared with the size of alveolar ducts. Entering the lung air ducts, dust is deposited on the wet walls of bronchioles and hampers the air intake. The lungs have a defense mechanism in the form of mucus, which removes these particles from the lungs, if the amount is not remarkable. If a person inhales dust-laden air every day for a long time, the mucus fails to do the job, and lungs lose their ability to deliver oxygen into the blood. This has become a major cause of diseases, especially for coalmine workers and other people dealing with dust-laden air.

The other major problem of technology development is the production of harmful chemicals and fumes that people might inhale. When physiology describes gas exchange problems in the lungs, many things are taken into account. I'd prefer to avoid detailed description of all processes in this book and limit it to mention of two important factors. They are the states of alveolar and blood capillary walls.

In normal conditions, oxygen molecules move easily between air in alveoli and bind to hemoglobin in the erythrocytes, traversing the 0.5 micron barrier by passive diffusion. When we inhale irritating chemicals (which are multiple), sensitive alveolar epithelium may be disturbed and inflamed. Such inflammation changes properties of alveolar epithelium, and if there is any disturbance in the alveolar walls, oxygen diffusion may drop. In cases of severe irritation, people can suffer suffocation.

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These cases occur mostly in industrial intensive places, where irritating chemical fumes are used in technological processes. However, even simple exhaust fumes from the combustion engine cars contain carbon monoxide, sulphur oxide, nitrogen oxide, Br_2O , unburned carbohydrates, and lead (when it is used in the gasoline production process). A more aggravating picture can be seen in the burning of brown coal. These fumes also contain mercury (Hg), arsenic (As), and selenium (Se).

All these molecules can penetrate air-blood separating walls in the lungs and go directly into the blood. Polluted air becomes one of the most remarkable sources of toxicity for the organism and is responsible for the development of many diseases.

Someone can argue, what is this guy saying? There are only negligible traces of these elements in the exhaust fumes of a car. Let's look what happens in the big cities with plenty of cars and other fossil fuel burning furnaces during calm weather without wind.



These pictures present the state of the air in Moscow (Russia) (left) and Los Angeles CA (right) during a calm summer day.

European region office of World Health Organization reported in 2013: "There is no evidence of a safe level of exposure or a threshold below which no adverse health effects occur. More than 80% of the population in the WHO European Region, including the European Union (EU), live in cities with levels of PM exceeding WHO Air Quality Guidelines."

I like the campaign against the use of vehicle gasoline engines, but I would shift the emphasis from climate change to the poisonous effects of this harmful technology. Accumulation of CO_2 in the atmosphere can be stopped, and even reversed, if people stop deforestation on earth and restore for-

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ests destroyed due to increased necessity of crops for cattle (discussed in chapter VIII). However, only replacing gasoline with renewable energy sources can stop the increase of health problems caused by the adverse effects of fossil fuel burning.

The use of fossil fuels on earth is devastating. Severe air pollution affected London during December 1952, combining cold weather with an anticyclone and windless conditions. Great Britain's government medical reports in the following weeks estimated that up until 8 December, 4,000 people had died prematurely and 100,000 more were made ill because of the smog's effects on the human respiratory tract. More recent research suggests that the total number of fatalities was considerably greater, about 12,000.

The World Health Organization provides the following key facts: "Around 3 billion people heat their homes and cook using open fires and simple stoves that burn biomass (wood, animal dung, and crop waste) and brown coal. Each year 4.3 million people die prematurely from illness attributable to household air pollution caused by the inefficient use of solid fuels (2012 data). Among these deaths, 12% are due to pneumonia, 34% from stroke, 26% from ischemic heart disease, 22% from chronic obstructive pulmonary disease (COPD), and 6% from lung cancer."

It's the high time to stop this madness and pay attention to renewable energy, which we have on earth in the quantities that far exceed our needs.

In addition to industrial air pollution, people invented tobacco smoking, inhaling the smoke of burning tobacco leaves for a dubious "pleasure" of distorting the reality of the surrounding world. Here's what the American Lung Association writes about tobacco smoke: "There are approximately 600 ingredients in cigarettes. When burned, they create more than 7,000 chemicals. At least 69 of these chemicals are known to cause cancer, and many are poisonous. A few of the chemicals found in tobacco smoke are acetone, acetic acid, ammonia, arsenic, benzene, butane, cadmium, carbon monox-

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ide, formaldehyde, lead, naphthalene, methanol, nicotine, tar, and toluene."

In addition to tobacco smokers' unpleasant smell and earthy looking skin, keep it in mind that all these ingredients go directly into their blood. No matter how small the quantity of poisonous ingredients, they can accumulate in the body with regular smoking and cause the development of many dangerous diseases, including cancer.

One of the many harmful side effects of smoking is the development of anemia due to an accumulation of carbon monoxide in the blood. CO binds with hemoglobin hundreds of times tighter than oxygen, and hampers the delivery of oxygen. Thus, cigarette smoking causes carbon monoxide poisoning. Normally, CO is maintained in the blood at a level of 4-6 ppm, but in smokers the level is increased to 20-40 ppm. A carbon monoxide level of 40 ppm is equivalent to a reduction in hemoglobin levels of 10 g/L. A second toxic effect of CO is a shifting of the oxygen dissociation curve to the left. So the hemoglobin is less likely to release its oxygen to the peripheral tissues.

That was a short description of the harmful effects of the development of chemical technology. Let's look at other facts widely used by people in homes situated in the cities that have great air pollution. They include air filtration devices. In an attempt to avoid inhalation of air polluted with exhaust fumes and other harmful chemicals, people invented air filters, which uses felt to rid the air of dust and other floating particles, and even chemicals.

If filters are changed regularly and do not accumulate microorganisms, they really help, except for one problem that arises when filters are used. They also remove ions from the air. What are these air ions? And are they good or bad? Let's talk about it.

Oxygen is a very reactive substance that readily forms compounds (notably oxides) with most elements. Many organic molecules in living organisms contain oxygen. There are also other reactive oxygen species (ROS), such as superoxide ion (O_2^-), hydroxyl radical (OH), hydroxide ion (OH^-), hydro-

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gen peroxide (H_2O_2), and singlet oxygen (O_2^* , which represents an excited state of one electron in the oxygen molecule). They are even more aggressive oxidants than oxygen itself and can damage cells and cause their death. Nevertheless, nature needs them for healthy metabolism in the cells. The role of ROS in the organism is not quite understood yet, and one can meet very controversial speculations that involve ROS action descriptions.

Many ROS are produced in the cells as a normal product of cellular metabolism, mostly by NADPH oxidase. This is so called endogenous ROS. ROS and antioxidants are produced in the body in more or less proportional amounts in young healthy organisms. Besides, ROS play important roles in cell signaling and homeostasis that permanently work in the body.

Exogenous ROS in humans, such as superoxide and singlet oxygen, are produced during photosynthesis in trees and especially abundant in the air after a rain and lightning storm. The most efficient producers of superoxide and singlet oxygen are pine trees.

Such ROS as hydrogen peroxide is also produced in the normal functioning of sea animals, such as anemone and sponges. Both use peroxide probably for defense and hunting purposes since it generates an aggressive solution for invaders, which perish in it. Peroxide is used in white blood cells in the human body for the same purpose of defense against invading pathogenic viruses.

As we see, the role of ROS in the life of multicellular organisms is very wide and far from negative in spite of their aggressive oxidizing properties. Before invention of penicillin, defensive properties of ROS were used very widely in medicine. Doctors sent tuberculosis patients to live in pine-tree forests, and tuberculosis was healed within a couple of months, even in severe cases. Intravenous injections of peroxide were used to fight against very acute and life threatening cases of pathogenic bacteria invasions, such as syphilis.

Early in the twentieth century, Russian biophysicist Alexander Chizhevsky invented an air-ionizing device that pro-

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duced superoxide by applying high voltage (up to 1000V) electric potential difference between metal wires. This invention was preceded by his experiments with rats placed into cages with air passing thorough filtration and thus deprived of all superoxide ions. The results were devastating: rats died within a week. That's why, when people use air filtration which removes ions from air, it might be wise to restore their presence in similar quantities, which do not exceed 80 particles per billion (ppb).

The independent testings of his device provided no healing results, and his invention met heated opposition. I can suppose that only diseases caused by bacteria and viruses can be treated in such way, supplying additional ROS for the body and thus assisting it. And it's not only theoretical speculation. I use ROS generators in everyday life when feel that my body is unable to fight against pathogens and when plant phytoncides are not helping either.

For example fungal infections (which are multiple, probably including cancers) can be healed with intravenous injections of hydrogen peroxide. This method is widely used in the U.S.. The average course of treatment includes about six injections and may cost about \$600.



I use this portable device instead - an ultrasound air humidifier - which sprays not water in my case, but 3% hydrogen peroxide. Combined with programmable timer, this humidifier can be turned on every hour for two-three minutes. From my experience, I also program it to work for a half hour every night after midnights, and

use such a procedure for several days. However, even the first night provides tangible results in the form of a good healthy feeling after the first half hour procedure. The humidifier is placed over my bed at the distance of three-four feet. In this case peroxide vapor is diluted as it comes down to my head.

As seen in a similar action of intravenous injection this method supplies hydrogen peroxide to the blood through the

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lungs by inhaling the vapor. It's necessary to remark though, that this procedure can be dangerous and it's necessary to use it with remarkable precautions, following personal feelings as the major detector of the healing or poisoning effects. Always remember that alveolar membranes are very sensitive and vulnerable. If you decide to try, proceed with care.

The respiratory system has received the attention up to now. But the cardiovascular system is the second part of this oxygen supply bundle. The state of pulmonary and other capillaries plays not a less crucial role in the efficient gas exchange procedures. If capillaries are in bad shape, gas exchange becomes hampered and oxygen delivery to the body cells does not work well. This may cause premature death of cells and damage to organs.

In this respect, restoration of the oxygen supply becomes one of the major approaches to disease treatments. Pure oxygen respirators have been known in medicine and used against heart diseases for a long time. Moreover, hyperbaric oxygen chambers are widely used now for curing many diseases, including those caused by aging.

Such extreme measures as pure oxygen, especially in hyperbaric chambers, can be useful for acute states of health. However, restoration of good natural health can be achieved by natural methods only. These methods are vegan diet, healthy water, and athletic activities, accompanied by organism hardening, which is discussed in the next chapter.

VI

Physical exercising and organism hardening

It may seem strange, but this chapter begins with blood homeostasis. As we know, blood pH holds a strict range between 7.35 and 7.45. Why so?

A modified version of the Henderson–Hasselbalch equation can be used to relate the pH of blood to constituents of its bicarbonate buffering system:

$$\text{pH} = 6.1 + \log \left(\frac{[\text{HCO}_3^-]}{[\text{H}_2\text{CO}_3]} \right)$$

where:

- pH is the acidity in the blood
 - $[\text{HCO}_3^-]$ is the concentration of bicarbonate in the blood
 - $[\text{H}_2\text{CO}_3]$ is the concentration of carbonic acid in the blood
- (from "Estimating plasma pH" in: Bray, John J. (1999). Lecture notes on human physiology, P.556, Malden, Mass.: Blackwell Science. ISBN 978-0-86542-775-4).

The pH of blood depends mostly on the relation between concentrations of bicarbonate and carbonic acid in it. In case of complete balance between bicarbonate and carbonic acid, blood pH becomes equal to 6.1. To secure blood pH at the level of 7.4 in the arteries, body should maintain $[\text{HCO}_3^-]/[\text{H}_2\text{CO}_3]$ relation at the level of approximately 20. The body somehow increases the level of bicarbonate and decreases carbonic acid in the arterial blood. This is very important feature that plays a crucial role in the healthy metabolic process of the body. The reasons for this can be explained as follows.

In 1904, Danish physiologist Christian Bohr described a physiological phenomenon, stating that hemoglobin's oxygen binding affinity is inversely related to acidity of the blood (the Bohr Effect). Thus blood pH=7.4 provides for the high binding affinity of oxygen to hemoglobin. This feature allows a successful exchange of CO_2 for O_2 in the lungs. Oxygen bound to hemoglobin in arterial blood is released in those parts of the body that have acidity lower than pH=7.4. The more acidic the

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environment, the more oxygen is exchanged for CO_2 — a very wise self-regulation.

We also know that CO_2 in the intercellular water generates carbonic acid H_2CO_3 ($\text{H}_2\text{O} + \text{CO}_2 \rightleftharpoons \text{H}_2\text{CO}_3$). During the metabolic process, cells consume oxygen and release CO_2 . In addition, muscles generate lactic acid in the process of intensive work, making the environment acidic. Thus muscles, which generate more lactic acid and CO_2 , receive more oxygen and can continue to work with the same high rate, having an optimal oxygen supply.

This concerns not only muscle cells but all other cells in the body, including the brain. Carbonic acid can dissociate, forming protons and bicarbonate ($\text{H}_2\text{CO}_3 \rightleftharpoons \text{H}^+ + \text{HCO}_3^-$). The more protons present in the blood, the lower relation $[\text{HCO}_3^-]/[\text{H}_2\text{CO}_3]$ and the lower is blood pH, and vice versa. This means that, if intercellular liquid is enriched with protons, the environment becomes more acidic and gets more oxygen from the blood.

That's why the intensive work of all body cells is so important for human beings to provide for healthy body metabolism. To satisfy this requirement, we will discuss all types of activities natural to the body, which include but are not limited to movements, intensive brain work, body exposure to changing temperatures, and positive emotions.

One of the most natural activities is movement. People begin this activity before birth. The action of this activity has been discussed at the level of oxygen exchange between blood and cells. However, the mechanism is much more complex, because it involves neuron and hormonal signaling in the body.

Our movements are controlled by our brains. We know perfectly well how to move our fingers, open eyes, and turn the head. Besides conscious movements, there is some subconscious signaling of which we are unaware. This subconscious signaling begins when we are in the mother's body and continues through life, up to the last breath.

This subconscious activity awakes us in the night and causes changing body position in bed because the body sig-

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nals to the brain that some of its parts do not have enough oxygen supply because of poor blood flow. We turn the body, even without being in full mind control, and we continue a sound sleep.

This signaling is known as reflexes. The notion of reflex has existed in physiology since the time of Rene Descartes. He believed that all life manifestations of the body have a reflex nature, and he presented the generalized scheme of the reflex act. The basis of Descartes' reflex action has been preserved — until now. The broad presentation of this signaling can be described as follows:

A wide range of regulatory systems in the body generates chemicals that make the nervous system transmit signals to the body glands. The glands that perceive these signals generate so-called hormones. A hormone is a class of regulatory biochemicals that is produced by a gland and transported by the blood system to a distant target organ to coordinate its physiology and behavior. The variety of hormones synthesized in the body is very wide.

A certain hormone synthesis occurs in response to specific biochemical signals. For instance, glucose concentration modulates insulin synthesis in the pancreas. In many cases, regulation is dependent on a complex set of direct influences and feedback interactions involving the hypothalamic-pituitary axis.

While the major role of the hypothalamus gland is distribution and transmission of signals from the nervous system, the pituitary gland synthesizes a wide range of hormones playing a crucial role in the major life processes of the body. Hormones secreted from the pituitary gland help to control the following body processes: growth and metabolism, blood pressure, sex organ functions in both males and females, pregnancy and childbirth, including stimulation of uterine contractions during childbirth, breast milk production, thyroid gland function, regulation of osmolarity in the body, water balance via the control of reabsorption of water by the kidneys, temperature regulation, and pain relief.

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Pituitary gland is a grayish body of a pea size and weighs about 0.5 gr. It is located in the lower part of the brain and is protected by a bony structure of the sphenoid bone. It is sometimes euphemistically referred to as "conductor" of hormonal changes leading to disease and aging.

The pituitary gland has two distinct parts: the anterior lobe, and the posterior lobe. The release of pituitary hormones by both the anterior and posterior lobes is under the control of the hypothalamus, albeit in different ways. The posterior lobe develops as an extension of the hypothalamus and participates in signal transmission, while the adjacent anterior lobe does not develop from the hypothalamus and is mostly aimed to produce hormones. For example, the anterior lobe releases thyroid stimulating hormones (TSH) going to the thyroid gland. These hormones play a strong role in many body functions, including the heart rate, metabolism, and temperature regulation.

In the middle of the nineteenth century, American anatomist Wilder gave pituitary gland the name of *hypophysis* (from the Greek. Hypo - under and phyo - grow). So, the word "hypophysis" literally means "grow under".

The hypophysis produces rejuvenating and healing hormones called endorphins and hormones that control the operation of all endocrine glands: thyroid and adrenal glands, and gonads, etc.

If the blood receives stress hormones (adrenaline and cortisol), the hypothalamic-hypophysis chain is forced to urgently inject an "antidote" — endorphins — into the bloodstream. Endorphins are universal painkiller hormones that make our body feel as light as a feather; a person simply ceases to feel the body.

But this is not all, and not the main action of endorphins. After they are returned through the blood flow to the brain, they simply reshape the perception of reality, making it positive, and even rosy. All sorrow, pain, suffering, and even

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depressing memories and "pangs of conscience", fade into the background.

However, the life-giving blood injection of endorphins is possible only in one case: if a person has normal output of these hormones (hormonal balance is not disturbed). Yet, not very many people are lucky to have such normal hormonal balance. In many instances, endorphins enter the blood in insufficient quantities, literally in the misery, which is not even able to neutralize the destructive multi-action of stress hormones, which are abundant in the current growth of the number of active stresses on us.

If the condition exists when negative emotions prevail, vegetative and endocrine imbalance becomes persistent and irreversibly leads to diseases and premature aging. So-called "chronic fatigue syndrome" is actually caused by a failure in the hypothalamic-hypophysis bundle.

The best way to get rid of the fatigue syndrome are the movement and organism hardening processes, because they generate the alarm signals of stress to the hypophysis which produces endorphins that can mitigate and even remove this syndrome. Biking, slow running, or walking for a long distance produces multiple healing effects, which are caused by an active oxygen supply to all of the body, and especially to hard working muscles.

In addition, long movement develops the sense of stress in the body, which also causes generation of endorphins that work as the best sedative medicine, removing all unnecessary exaggerated worries and problems, providing a sense of good balance and a command of life. Production of endorphins in the process of running also gives birth to the sense of easiness and pleasure, making long runs attractive to people.

The organism hardening process using cold water provides the same healing effect, which can be described as follows:

When a person jumps into a cold bath, initially there is anxiety and excited emotions of fear. Temperature sensors under the skin produce signals that are received by the hypo-

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thalamus and transmitted to the hypophysis, which urgently emits the hormone epinephrine ("alarm hormone") into the blood. Epinephrine causes a reduction of the skin muscles and simultaneously dilates blood vessels of the heart, brain and lungs.

Skin blood vessels are narrowed to maintain the normal body temperature and to prevent overcooling of the internal organs. As a result, the heart activity and blood pressure are increased and the blood supply to muscle tissue and the brain is also increased. All this contributes to an increase of body temperature and optimization of biochemical reactions that provide for additional energy and muscular strength of the body and for emotional splash.

People in Russia often use hot steam rooms with temperatures over 195F to get excessive heat into the body, usually accompanied with jumps into a cold bath or even into an ice hole of a river or a pond. Such hot steam rooms lead to body overheating and development of the same chain of biochemical reactions described above. Besides, body overheating is harmful for pathogens. It also makes the body sweat intensively and thus effectively removes toxins and heavy metals through the skin. All this provides for a sense of remarkable rejuvenation.

Besides, it's a good idea to help our immune system to fight against pathogenic invaders. One of its tools is a healthy lymphatic system. The lymphatic system does not have a pump like the blood system has; lymph propulsion depends on body movements. Exercise, massage, and alternating hot and cold temperatures can really boost the immune system, promoting toxin removal from the body through the lymph. That was one of the major ideas that Shatalova used for her system.

Moreover, steam is very rich in hydronium ions (H_3O^+), which makes it acidic with a pH about 5.0–5.5. As described in the previous chapter, skin also has the same range of pH on its surface. So, a steam room has a very good influence on the skin and is a good source of excessive protons, which are essential for cell metabolism. That's why people who take steam

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rooms regularly usually have smooth, young skin (if they don't smoke).

Some practitioners in Russia used high temperatures to get rid of pathogenic bacteria and viruses. In the clinic conditions, they used very hot water baths with temperatures above 41°C (106°F). Bathing in such hot water for more than a half hour raises body temperature to levels very harmful to pathogenic bacteria and can cure dangerous infectious diseases.

Nature uses this method when pathogenic viruses are detected in the blood, increasing body temperature above its usual level of 36.6°C (97.9°F). Sometimes the body temperature can increase up to 40°C (104°F). This is a natural process that allows the immune system to get rid of pathogens quickly. Regrettably, people are afraid of even a minimal increase of body temperature above normal level and use antibiotics to get rid of pathogens. Introduction of artificial antibiotics into the digestive system disrupts the normal functions of the human microbiome, causing appearance of other, not less dangerous, diseases while fighting against pathogenic viruses.

Regrettably, the immune system cannot detect pathogenic fungi in the gut and does not use such an effective defense method as the increase of body temperature. That's why the use of hot baths can be a very efficient method of fight against pathogenic microorganisms in the body.

The other not less effective alternative method is the use of low temperature baths. There are some people in Russia who used icy water bathing to cure cancer. But this method is more difficult to implement, because exact protocol was not developed up until now. Nevertheless, the process of using icy cold baths for healing and organism hardening has been known from ancient times,

Mountain skiing also provides a fantastic effect and brings a sense of rejuvenation. The mechanism of mountain skiing influence is not quite clear to me, but I suspect it works through an intensive supply of clean air, although with an oxygen deficiency that can be observed at elevations higher than 5000 feet. When muscles produce a remarkable amount

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of CO₂, blood vessels increase in diameter to intensify gas exchange in the body, and blood flow in the body becomes more efficient. It also might be the increase of NO₂ in the blood, which leads to some elevated excitement. Besides, close contact with beautiful scenery and nature in the mountains elicits positive emotions and satisfaction.

Tennis (or racquetball) is a good exercise in the sense that it requires a good orientation in space (thus training vestibular system) and complex movements, twisting the spine in all directions. The spine is a very important part of the body and must be trained thoroughly to fulfill its work efficiently. Many diseases trace their beginnings in the deformed spinal and neck column. Twisting the body and training muscles of the back should be an important part of body exercise.

Tennis is also very dynamic and trains mental attention and concentration due to the high speed of the ball, which is not easy to follow all the time. Such dynamic movements help not only maintain a healthy spine, but also a lymphatic system to clean the body of dead cells debris. Intensive exercise is always useful, especially for those with sedentary lives.

Many people still prefer to rely on medications and take piles of pills, forgetting that all medicine necessary to maintain good health and mood comes from healthy food, clean air and water, and produced in the body, if we live in peace and abide by the laws of nature.

Sometimes it's really difficult to push ourselves into intensive training or under a cold shower. Blame it on the absence of habits, laziness, or excessive weight. How can these obstacles be overcome? In three ways. The first thing is to gain a deep understanding that nature programmed humans for movements, and that a sedentary life is harmful to health and total wellbeing, including brainwork. The second step is composing a good program and schedule of things to do. And the third step is beginning to strictly fulfill this schedule. That's all that is needed!

In case someone allowed a severe illness to develop in the body to the level that limits the ability to move, it's wise to pass through clinical physiotherapeutic treatment and

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slightly improve health to the level that enables independent training and organism hardening procedures. To my mind, one of the most effective treatments is a hyperbaric oxygen chamber. The major purpose of such a chamber is to provide for an intensive oxygen supply to all organs of the body and to increase the metabolic rate, even when clogged blood vessels exist. An increased oxygen supply revives damaged organs and pushes up activity of the hypothalamus-hypophysis bundle, which regulates proper functions of the body organs.

After that, go to a gym and begin in small steps and slowly. Do it until a remarkable fatigue comes regularly. It's good if the gym has a steam room make you sweat intensively, cleaning the skin and removing toxins accumulated in the body. If there is a swim pool nearby, the task becomes even easier, because swimming does not require much effort to begin. Just jump into the water and move your limbs. After you get accustomed to long distance swimming (which is the only one really useful), you are ready to go outside and enjoy fresh air and natural water while training your body.

Never fill your stomach with food before exercising. A stomach constrains movement and contradicts the natural instincts of hunting for food.

This always helps to improve health conditions and mental activity, especially if one successfully manages to reduce weight. Moreover, the body weight tells much about health conditions. If the weight is at the lower side of the body mass index (18-20), you have probably gained a good state of health and can run several miles or swim 2-3 miles without a problem.

Your health is in your hands!

VII

Bio-energy

The story of bio-energy and bio-field begins in the westbound scientific world of the 1920s with discoveries made by biologist Alexander Gurwitsch (Russia). The concept of bio-energy in westbound science needs to be separated from the concept of energy channels used in China in ancient times, because the Chinese concept does not describe the nature of the energy in the channels.

During his embryology studies, Gurwitsch managed to note UV radiation from living tissue and introduce the concept of morphogenetic (biological) field; he later developed his theory describing the nature of the development of organisms.

Gurwitsch first observed biophotons, or ultra-weak biological electromagnetic waves, in the ultra-violet range of the spectrum in 1923. He named the phenomenon mitogenetic radiation since he believed that this light radiation allowed the morphogenetic field to control embryonic development. He published observations related how cell-proliferation of an onion was accelerated by directing these rays down a tube. The idea was not accepted and was overlooked for decades until it gained some renewed interest later in the 20th century.

For example, embryologists in the Biology Faculty of Moscow State University, L.V. Aleksashin and A.B. Burlakov, conducted experiments (1997) and published results (2010) in “Experimental and theoretical study of distant interaction of biological objects”, which supports Gurwitsch' theory. These experiments showed an informational connection between two petri dishes with embryonated fish (misgurnus) spawn placed one over the other. To check the speculation that embryos communicated in UV range of light, the scientists used two equal sets of petri dishes: one was nontransparent to UV light,

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while the other set had a UV transparent bottom of the upper dish.

The experiments in the UV nontransparent set confirmed that embryos in both petri dishes were independent according to normal development time. The UV transparent set showed that older embryos suppressed development of younger embryos.

Nobel laureate French virologist Luc Montagnier conducted research on electromagnetic signals from DNA. In 2009, Montagnier published two research studies detecting electromagnetic signals from bacterial DNA (*M. pirum* and *E. coli*) in water that had been prepared using agitation and high dilutions, and a similar research on electromagnetic detection of HIV DNA in the blood of AIDS patients treated by antiretroviral therapy. This time the electromagnetic field detected was a low frequency signal.

There are many other speculations and hypotheses using notation of bio-energy as energy generated in the living body, such as the Kirlian effect and others. They suppose some type of energy that has no clear evidence or record, and I limit this chapter with what interests me most. Besides, mental energy produced in the human brain is beyond my comprehension up to now.

How might it happen that cells of the body can emit light and communicate with each other to define the development of neighboring cells?

Biologist Petr Garyaev (Russia) speculated in the 1980s that the idea of "junk" DNA in genetic coding is wrong. He writes: "The Nirenberg-Krick (NK) model of the genetic code is wrong because it does not explain the role of the second half of the codons. The first half of the codons (32 codons) were quickly understood a long time ago: they are codons-synonyms. Hence, biological systems represent the redundancy and accuracy of the coding using isoacceptor tRNA. The second half of the codons is codons-homononyms. They are not equivalent, e.g., the same codons can code different amino acids and stop-positions in protein bio-synthesis."

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Jaqueline Barton, a California biochemist, studied conductivity of DNA chains and discovered in 2009 that they conduct electric charges. This observation made me thinking that DNA double-helices can serve as a waveguide for electromagnetic waves. The shape and length of DNA chains change properties of this waveguide and, hence, represent some coding information. It also means that "noncoding codons" also contain information, which might define morphology of a developing embryo and later the structure of the body.

I speculate that the structure and shape of this waveguide defines the structure of the biological field and thus the morphology of the body. This information can be transmitted to the neighboring body cells using UV light with wavelength probably of 240 nm. that can be generated when free protons form covalent bonding with oxygen in the process of metabolic reactions in the cells. It's just a preliminary speculation, which requires more detailed studies to become proven, but it is based on the logic of facts already known.

Biologist Garyaev also speculated that information contained in the cells can be transmitted to other living cells using holographic imaging. With the help of physicists, he designed a holographic imaging system of living tissue, using polarized red light. His multiple experiments showed amazing results, proving that genetic information was really transmitted through polarized holographic imaging of one living subject on another.

This method can be used for improving damage to body cells in the course of life. It also opens a wide road for experiments in genetics and medicine and deserves very precise attention, to my mind, because of its unprecedented abilities. I would be happy to participate in the experiments with living tissue holographic imaging in collaboration with biologists interested in this subject.

This does not mean that a new panacea might be developed to remove all responsibilities from people and allow them to live an unhealthy life style with the hope that all damages accumulated in the body can be improved upon later.

Bio-energy

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All this indicates how little most people know about nature. And it's not our fault that we are unable to comprehend all the laws of nature at once. It only shows how complex nature is. It's impossible to separate nature into *subjects* and study everyone separately without paying attention to other phenomena. Everything is interconnected and cannot be separated in real life. In trying to remove one influencing subject, we change behavior of the subject under the study.

This remarkably increases the responsibilities of scientists who experiment with genetic engineering. They interfere with nature without knowing all the laws, which can lead to unpredictable results. I don't mean that all research in this direction should be frozen, but that we must proceed with caution, remembering that all our actions have consequences that may not coincide with our expectations.

VIII

Physical and Moral Health and Human Society

To begin a discussion of aspects of human health such as moral health I would like to make a trivial observation of the development of human society development. I also would like to limit the subject with scientific approaches to the question, thus limiting discussion of the Creator.

Life of every living species on earth (including human beings) is nothing more than everyday communication with the surrounding world — nature and communities of the same and other species. In the course of development, humans used an advantage of physiologic design to establish dominance over other living species, using them to satisfy needs for food and labor. Humans invented tools of murder and thus, the natural balance on earth was broken. The only competitors for a modern human are representatives of the same community.

Before the invention of firearms, physical features of an individual provided an advantage over others, establishing inequality in human communities. Money, invented as a tool of natural product exchange, became an instrument to increase this inequality. Inventions of mass production and mass distraction multiplied inequality many times.

Sophisticated production technologies and societal development made spiritual life of human beings very complex. It's evident that spiritual health is a constituting part of human health and, in many cases, a decisive one. Human relations can be considered one of many causes of health problems. A person experiencing the cruelty and injustice of society often experiences health problems that are not only mental, but physical as well.

Regrettably, the history of human society is full of cruelty to both nature and human brothers and sisters. An exami-

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nation of communications of international information agencies can result in a conclusion that human development has advanced only in a technical way. There is little progress observed from humanitarian points of view. Humanity lives in an incessant state of hostility and wars.

People are warring, not only with themselves but also with Mother Nature, paying attention to possible consequences of their *activity* when obviously critical results become evident. Big corporations and monopolies are unable to overcome economic crises that follow one after another. National leaders mostly consider their country's advantages fighting against others. Churches spend a remarkable amount of time segregating others because of some discrepancies in their teachings. But fighting always damages a society's development.

Humanity is separated with no general plans of development, devoting their basic efforts to economic, political, and religious hostilities. And very often to simple physical destruction of each other, on the transnational level as well as with their fellow citizens. What is the basis of this hostility? And are there ways to reduce it and ways to combine the efforts of everyone on the entire globe in a common plan of human civilization development?

The basic source of enmity is the inborn instinct to establish control over others, incorporated into humans as well as into all other primate inhabitants of the Earth by nature, and poorly controlled by conscience. A funny thing, this idea was drawn into the civilized world as the only law of life development, known under the name of "Law of Evolution by Darwin". However, this law is limited to consideration of the animal beginning of humans and does not reflect other laws of personal development, that have been known from the ancient times.

Leaving aside the disputable statements that life was born in "the senseless nature" casually, as yet indicates no direct scientific proof, but only logic conclusions, denying this unproved assumption. Thinking of the logic of live world development laws, it is possible to continue on this path. Nobody

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is surprised while studying physical laws of the universe, in particular the fact that all chemical elements were created of elementary particles according to the certain laws of synthesis formulated in school textbooks, and accepting their existence as a fact evident by itself. Nevertheless, many are confused when speaking about laws of live matter existence and development, considering it a casual thing which can be described by statistics only.

Let's ask, are there laws of live matter formation? The fact that we do not know them yet and have reached only the first steps in their studies does not mean that they do not exist. There is a quite admissible assumption that live cells have been constructed according to certain laws in the same way that chemical elements were synthesized during corresponding environment conditions.

And many people understand it now, the conductor of these morphologic laws of live matter is water, which has a complex structure and is the cradle and carrier of life on Earth. This assumption has a better chance to be called a truth than the statement about eventuality of life origin on Earth. When water, light from the sun, and minerals come together at a certain range of temperatures, formation of living cells begin — according to some certain rules.

Continuing the course of conclusions in the same way, it is quite possible to admit that the whole process of wildlife development lives under a set of the laws. And proliferation of the animal world, as well as human development also submits to some laws.

It's hard to understand the laws of animal world proliferation, but what is evident that animals follow strict rules of intrinsic behavior, which are called *instincts*. Humans, as a part of the animal world, also carry inborn instincts and follow them subconsciously. Besides, humans possess a germ of an inquisitive mind as well, in order to develop a complex civilization. Do the laws of civilization development exist? And if these laws exist, then what are they?

These laws exist and have been well known for a long time. The main law of civilization development is the "Golden

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rule", known for more than three thousand years. Here are its basic formulations in different civilizations and during different epochs of life:

- 1300s BC — White Lodge: "May I do others as I would that they should do unto me."
- 500s BC — Confucianism: "What you don't want done to yourself, don't do to others."
- 500s BC — Buddhism: "Hurt not others with that which pains thyself."
- 500s BC — Zoroastrianism: "Do not do unto others all that which is not well for oneself."
- 500s BC — Jainism: "...refrain from inflicting upon others such injury as would appear undesirable to us if inflicted upon ourselves."
- 400s BC — Plato in Greece: "May I do to others as I would that they should do unto me."
- 300s BC — Hinduism: "Do naught to others which if done to thee would cause thee pain."
- 100s BC — Judaism: "What is hateful to yourself, don't do to your fellow man."
- AD 30s — Jesus the Christ: "Whatsoever ye would that men should do to you, do ye even so to them."

(This list is a credit of *True Esoteric Traditions* by M. Dale Palmer)

The Golden Rule forms a basic general "Law of Civilization Development". Rules of people's behavior descend from this law. People have placed the formulation of these rules in many books describing initial basic doctrines and religions: *Tao Te Ching* by Lao Tzu, *Da Xue* by Kong Fuzi (*Confucius, The Great Learning*), *The Bible*, *Torah*, *Zend-Avesta*, *Grant sahib*, *Vedas*, *Koran* and other wise texts.

The second law of development is "The Law of Compensation". In history it is known as the law of Karma, which may originate in the shramana tradition, of which Buddhism and Jainism are continuations, and from Jewish Cabbala as well. This law supplements the Golden Rule, giving it wider interpretation.

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The law of compensation, or karma: "For each action there is an equal and opposite reaction. For each sorrow or joy we bring to others, we shall have experience in like degree and manner at the appropriate time, so that the lessons to be gained will teach us our error and increase our understanding." (From *True Esoteric Traditions* by M. Dale Palmer). It's a good idea to extend this law much wider than only human society and apply it to the animal world; animals also have souls.

One more law sounds like: "Consciousness defines everyday life". This law is reflected in the works by such philosophers as Pythagoras, Socrates, Plato, Hegel and many others, preaching and protecting the concept of "Absolute Mind" and spiritual development as a fundamental principle of communication of humans with nature. Humankind developed such notations as conscience and honesty, which are the major contributors to the development and prosperity of human civilization.

Analyzing historical evidences, one understands that civilization reached the greatest peak when people followed the laws of civilization development. The laws of human civilization development are the laws established by nature. Not more and not less than that. The fact they are known from ancient times of existence indicates they are incorporated in an individual in the deepest corners of the mind, which we have got used to calling the Soul.

For development of human civilization, it is necessary to begin a study with the natural sciences in the very first years school. Only civilization with respect and abidance of the laws can reach a high level of development. People are born with creativity, and their development is defined by suppression of beastly instincts and submission to goodwill instead of conspiring with these instincts. People must live in harmony with nature or suffer destruction and extinction.

It is difficult to expect a positive reaction from someone who has been shown a hostile attitude, or even aggression. In his Sermon on the Mount, Jesus described how to love people. But it is not easy to understand this Law of Love

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preached by the Christ. Not many people can do this. Does this mean that the Law of Love is utopian? Everything depends on our will and the level of consciousness. At least for those who consider themselves as not religious but spiritual, development of nonsectarian humanity is quite accessible.

It is possible to join these teachings on a scientific level that singles out the most important parts of the religious teachings and avoids religious conflicts and historical distortion. The main idea that joins all these teachings is pretty straightforward: a person should move from a beastly state of mind and behavior to spiritual consciousness through accumulation of modern knowledge and ancient teachings. This approach laid a basis for the main ideas of Nonsectarian Humanity (see Attachment C), which is the gist of major rules from religions and some sayings of famous modern people. Anyone is welcome to spread this set of ideas around and unite it with other similar ideas, which are considered important to achieve love and friendship development.

Learning teamwork and friendship is much more important than learning leadership. As Henry Ford said: "Coming together is a beginning; keeping together is progress; working together is success." He also repeated: "If money is your hope for independence, you will never have it. The only real security that a man will have in this world is a reserve of knowledge, experience, and ability".

Thus a growing generation of well educated, knowledgeable, and spiritually conscientious people is the only way to a highly developed society. But spiritually conscious people should study and follow the laws of civilization development. It is natural that these studies should begin during the youngest years in school; new textbooks for children that explain these rules at the level of tales, and manuals for the middle school should be developed.

It would be wise if these studies accompanied a new generation during the whole course of high school studies. Thus these studies should adopt a form of comprehensive collaboration with all subjects at high school, beginning with the history of human society development and continuing

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through courses of science that distinguish spiritual designs in science from the harmful ones. Not only textbooks, but teachers are needed who can spread this knowledge without the distortion of personal attitude.

It seems that this simple idea is not easy to implement since investment is needed to overcome power of god of money (Mammon), quoted in the Bible as “a competitor to God”, and return to nature – a difficult task requiring participation of highly developed powerful and wealthy people. There are many powerful corporations and wealthy people in the U.S. and throughout the world. But are there among them any who can fight against the power of money?

This problem can be avoided in a different way since these ideas are quite common to those with democratic minds. There are many people claiming they are spiritual but not religious, and bearing the idea of nonsectarian humanity in mind. The idea of scientific laws of human society development is for them.

It is not necessary to look for money, but for advanced people to join their efforts and compose such manuals and textbooks for children voluntarily. It is also possible to find volunteers ready to teach children. The only thing needed here is an organizing core to coordinate all efforts in this direction. The main task of this organizing core is promotion of an initiative into educational programs all over the world.

How can we form this organizing core, and is the U.S. or some other country ready for such efforts to lead human society into a happy peaceful future? Besides, is it necessary to do this? Yes, it is necessary if we wish to live healthy and productive life in a harmoniously developed society.

Many mistakes were made in the course of technology development. Beginning with the middle of the twentieth century, nature is suffering terrifying pollution due to the mindless activity of people on their way to developing technology. Rough mistakes on this way are countless. Everything — water, air, and soil — is polluted to the extent that it provides a harmful backblow to human health.

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Burning forests, coals, and use of fossil fuel combustion engines have led to destabilization of the balance between CO_2 and O_2 in the air, which has been happening for the last several thousand years. People's craving for animal food and rejection of plant-based food has led to a massive deforestation, since animal growth has had to compete with fields for farming. If clearance of forests in America continues to increase numbers of cattle at the present rate, in 50 years there will be no forests left. The same happens around the world: 25% of Central America's forests and 38% of the Amazon rain forest have been destroyed in favor of cattle grazing. The 1,300,000,000 cattle in the world emit 60,000,000 tons of methane per year (methane is a greenhouse gas that leads to global warming).

As mentioned in the chapter "Food as Medicine", remarkable amounts of crops grown for cattle and ourselves becomes genetically modified and causes disruption of the natural balance, hurting microbiomes of our guts and cattle guts as well, which causes development of diseases. In this sense, genetically modified food and microorganisms become a dangerous weapon in the arms of unhealthy aggressive people. The weapon, more dangerous than a nuclear one, should be taken under the control of democratically minded nations. Otherwise the spread of hidden wars is inevitable.

Now we are trying to restore damaged nature, knowing that pollution is harmful for human health too. What about the plants we eat? Can we grow such plants without pesticides and genetic modification? The answer is: Yes. Many plants develop defense mechanisms against pests. It's necessary to use those plants and their defense mechanisms to preserve the crops, but this use should be a natural process, without the use of genetic modifications. Does it require more labor? Yes, it does. It becomes difficult, time consuming work. But in this way we can have natural food, which gives us necessary nutrition and is not harmful. We shall think about this NOW. Procrastination is disastrous in this case.

The spread of mortal diseases is frightening. It seems that conventional medicine is unable to stop the pandemic

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propagation of cancers, diabetes, heart diseases. It is high time to think about new approaches.

The annual report of the American Cancer society provides the following estimations and facts: "In 2014, there will be an estimated 1,665,540 new cancer cases diagnosed and 585,720 cancer deaths in the U.S. Cancer remains the second most common cause of death in the U.S., accounting for nearly 1 of every 4 deaths."

World Cancer Research Fund International: "There were an estimated 14.1 million cancer cases around the world in 2012. The number is expected to rise to 19.3 million by 2025."

The American cancer society tells in its annual report "Can Cancer Be Prevented?":

"A substantial proportion of cancers could be prevented. All cancers caused by cigarette smoking and heavy use of alcohol could be prevented completely. In 2014, almost 176,000 of the estimated 585,720 cancer deaths will be caused by tobacco use. In addition, the World Cancer Research Fund has estimated that up to one-third of cancer cases that occur in economically developed countries like the U.S. are related to overweight or obesity, physical inactivity, and/or poor nutrition, and thus could also be prevented. Certain cancers are related to infectious agents, such as human papillomavirus (HPV), hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV), and Helicobacter pylori (H. pylori). Many of these cancers could be prevented through behavioral changes."

Our lives become more and more expensive due to unhealthy habits and harmful addictions. Many billions of dollars are spent to ease consequences of our bad habits. It is much easier to go to the pub and drink beer instead of running three miles. The first impression is almost the same: a sense of strong body and ease of movement and thinking. The consequences are the opposite however.

Beer damages brains and poisons organs. A man, addicted to beer, gains feminine features because beer flavored

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with hops contains estrogens. Here's how Russian psychopapist Dr. Sergei Nikitin describes action of beer:

"In addition to the kidneys and liver, beer breaks down hormonal balance. Look at the middle-aged person in a so-called "beer" nation: puffy face, saggy *beer belly*, and nephritis. I think no further arguments are needed.

Gynecomastia (breast enlargement in males) is observed more frequently in beer alcoholics than in nondrinking men. In this case, it is associated with impaired liver function. Liver is the main organ that recycles and inactivates hormones. Alcohol does not improve the condition of the liver. Alcohol addiction, in particular to beer, is accompanied by an imbalance between male and female hormones. Incidentally, marijuana also provokes a rather quick gynecomastia.

Actually, alcohol (ethanol, ethyl alcohol) itself is not dangerous; dangerous is the fact that the liver decomposes alcohol to acetaldehyde. This substance is the strongest poison to the central nervous system. Even more so, it destroys what in principle is nondestructible — DNA structure. Elevated concentrations of acetaldehyde in the body cause the well-known hangover. Acetaldehyde is converted into a harmless acetate, but this takes time, which is why a hangover can be cured only by time."

That's a good remark about the acetaldehyde toxicity danger, but I don't agree with his statement that ethanol is not dangerous; ethanol remarkably influences consciousness and body metabolism. Ethanol is one of the rare substances that can be absorbed into the stomach and delivered right into the blood, which distribute it throughout the body.

The process of ethanol mixing with water is accompanied with an intensive thermodynamic reaction and release of remarkable heat, breaking the usual procedures of metabolic reactions. Water molecules in the body form hydrogen bonding with ethanol molecules (C_2H_5OH), which disrupts the process of metabolism to the extent that 0.4% or more of ethanol content in the blood causes death.

Ethanol molecules, when they reach the brain, have the ability to delay signals that are sent between nerve cells that

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control balance, thinking, and movement. People not only lose balance, but their actions become unpredictable and often aggressive. People lose control over themselves.

The process of alcohol consumption brings a sense of happiness at the first stage. If it becomes an addiction, the hormonal balance is broken and hypophysis does not produce endorphins in the amounts necessary to balance negative stresses. An alcoholic needs more and more alcohol to suppress pangs of sorrow. The same processes take place in the bodies of drug addicted people.

Moral health is a constituent part of healthy living. When a person feels aggression and hatred toward other people of the community, this causes tensions and a disruption of cordial relations with others. Health brings with it a feeling of moral satisfaction and happiness, and hence, a release of desirable endorphins, which are so necessary for healthy well-being for as many years on earth as nature presents to us.

It is easy to destroy everything around, but much harder to design, and make, and create an atmosphere of friendship and love. A destructive aggressive person cannot expect friendly relations from others and experiences shortage of endorphins. Humans do not contain endless energy sources. The physical health of an aggressive person can be broken someday. Problems usually begin with the onset of chronic fatigue syndrome, which soon brings other dangerous physical diseases.

As we can see, moral health is a crucial provision of healthy wellbeing. That's why Galina Shatalova was reluctant to treat morally unhealthy people. As she explained, her treatment might not bring desirable results until moral health is gained.

As she said: In each of us there is a taper of connection to the higher world. It's lighted, but do we see its light? In the everyday pursuit of pleasures and power, people forget about their general goal: human civilization development.

As a conclusion to this chapter we can say that our health is in our hands. People should repeat these simple words each morning as a prayer: I can be healthy if I do the

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right things, love others, and nature. We must join efforts in a conscious development of human civilization, free of cruelty and greed. Separated we are defenseless.

Conclusion

As the major conclusion to the question at the title of this story: if pancreatic cancer is a death sentence, I can answer: NO! Pancreatic cancer and other types of cancer, as well as heart diseases and diabetes are not death sentences. One can get rid of them, if one manages to redirect one's life and live a good healthy lifestyle. But what is this **healthy lifestyle**? As it was described in previous chapters, this is **life according to the laws of nature**.

I perceive nature as an all-seeing judge, punishing me for the violations of the laws. If I abide by the laws, I am well. If I don't, I shall suffer.

Do I know all the laws of nature? No, I don't. But I am an earnest pupil of nature, trying to understand and remember all the lessons. The lessons, which I learned during my life and from my disease exerted on me as a punishment, are as follows:

1. Live in peace with all animals; don't make them victims of your aggression, cruelty and nutrition whims.
2. Avoid laziness, train your body vigorously and harden the organism, so that it could be ready and armed to fight for survival.
3. Limit the greed of your appetite. Nature tends to form a reserve of nutrients in the body, but people must control this ability mentally in order to keep the body in good shape.
4. Remember about microorganisms living in the body; help friendly symbiotic ones and deprive pathogenic and harmful ones through nutrition. The content of the food changes the content of the microbiome in the guts.
5. Make your life austere and laborious for the sake of human society development.

Conclusion

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6. Enrich your brain with knowledge acquired by people during the long history of human civilization; but never stop. Revise mistakes and move on.

Those are the major rules which I try to follow, overcoming my laziness and greed. I am not very optimistic, and far from thinking that on reading this book everyone immediately becomes vegan and begins systematic physical exercising and hardening. Laziness and unhealthy habits usually prevail. As Galina Shatalova said: "changing your lifestyle is equal to being born anew." My goal is small: even if one person can take these simple words into account and begin thinking about living closer to a natural lifestyle, I can consider my work done.

Don't expect an easy road. Technology and industrialization broke our contacts with nature. We became victims of technology development and use a car on the smallest occasion, instead of biking or walking. We are trying to make a feast of every possible event, consuming enormous amounts of food full of fats, sugars, and animal based products. We go to a fast food place or a restaurant for our meals instead of cooking them from scratch or eating raw food in its natural form. Overcoming these unhealthy habits is a difficult task.

As Russian poet Alexander Pushkin said: "The habit is given to us from above. It serves as a happiness substitute." But we are to choose what is dearer to us: unhealthy habits or modest life, free of greed, cruelty, and abuses. This choice becomes more important for those who have developed a mortal disease. I've made my choice.

The mortally dangerous pandemics of cancers, diabetes, heart diseases are self-inflicted and caused by moral ailments. The major strategic plan of every democratic country and every democratic government (if it's truly democratic) should be investments into the moral health of the nation. Only a morally healthy society can be healthy physically.

Conclusion

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Healthcare system should switch efforts to disease *prevention* from disease *treatments*, and use natural substances instead of chemical pharmaceuticals. Democratically minded society should take control over genetic modifications of food and microorganisms, which are not less dangerous than nuclear weapons.

The final goals include high levels of humanity that allows us to get rid of all armaments and means of murder on earth and, instead, live healthy productive lives, a goal, which can be achieved only through working together. These simple rules constitute some of the possible ways to a healthy democratic society. Let's restore the natural balance of forces on earth. It's high time to stop crazy conflicts between people and nature and recollect that, without nature in its integrity, people cannot exist.

Good luck.

George Naturalist.

Attachment A

Free download from www.naturelaws.org/book*Food product pH measurements.**Fruits*

<i>Produce</i>	<i>pH</i>	<i>remark</i>
<i>Lemon juice*</i>	2.35	
<i>Lime juice</i>	2.29	
<i>Orange juice</i>	3.43	
<i>Tangerine juice</i>	3.68	
<i>Mineola</i>	3.76	
<i>Red grapefruit juice</i>	3.15	
<i>White grapefruit juice</i>	3.11	
<i>Blackberry sm.*</i>	3.24	
<i>Red globe grapes sm.</i>	3.73	
<i>Organic Brae-burn apple sm.</i>	3.88	
<i>Gala apple sm.</i>	3.81	
<i>Granny Smith apple sm.</i>	3.37	
<i>GS sm. With flax seeds 3 tsp.</i>	3.98	
<i>Pink Lady apple sm.</i>	3.62	
<i>Pacific Rose apple sm.</i>	4.21	
<i>Jazz apple juice</i>	3.61	<i>Canada</i>
<i>Ambrosia apple juice</i>	3.85	<i>Canada</i>
<i>Mango sm.</i>	3.24	
<i>Banana</i>	5.64	
<i>Avocado</i>	6.5-6.7	
<i>Orange juice (bottled)</i>	3.78	<i>"Heritage farm"</i>
<i>Apple juice (bottled)</i>	3.63	<i>Washington Natural</i>
<i>Orange juice (bottled)</i>	3.87	<i>"Simply Orange"</i>

** All juices and smoothies (sm.) were made of fresh fruits and berries (except otherwise remarked).*

Vegetables

<i>Produce</i>	<i>pH</i>	<i>remark</i>
<i>Red potato juice</i>	5.65	
<i>Red potato sm.</i>	5.95	
<i>Red potato baked</i>	5.86	
<i>Onion juice</i>	5.64	
<i>Garlic juice.</i>	5.86	
<i>Ginger root juice</i>	6.08	
<i>Red Bell pepper juice</i>	4.95	

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<i>Roma tomato sm.</i>	4.38	
<i>Tomato sm.</i>	4.31	
<i>Beets sm.</i>	6.04	
<i>Carrots sm.</i>	6.35	
<i>Iceberg lettuce sm.</i>	6.00	
<i>Mixture</i>	4.79	<i>Beets, carrots, Roma tomato, iceberg lettuce</i>
<i>Mixture + salt (0.5 gr)</i>	4.66	

Grains

<i>Produce</i>	<i>pH</i>	<i>remark</i>
<i>Red rice (cooked)</i>	5.92	<i>Boiled in RO water (pH5.95) for 45 min. (rice to water: 1:2.5)</i>
<i>Millet (cooked)</i>	6.23	<i>Boiled in RO water (pH5.95) for 25 min. (millet to water: 1:2.5)</i>

<i>Oil and honey</i>	<i>pH</i>	<i>remark</i>
<i>Sesame oil</i>	3.5 – 3.9	<i>Nishimoto trading co. Japan</i>
<i>Almond butter</i>	3.32	<i>Squeezed almond nuts</i>
<i>Peanut butter</i>	4.39	<i>Squeezed peanuts</i>
<i>Honey</i>	3.78	<i>Clove honey, grade A, Fred Meyer</i>
<i>Honey</i>	3.83	<i>Brazil, grade A, "Kroger"</i>

Waters

<i>City water supply (Ballard, Seattle)</i>	7.61	
<i>City water supply boiled</i>	8.35	
<i>RO water (Millipore)</i>	5.55	
<i>RO water boiled</i>	5.94	
<i>Distilled water (bottled)</i>	5.37	
<i>Distilled water boiled</i>		

Tea, cocoa, coffee (water – 250 ml. of boiled RO water pH = 5.94)

<i>Tropical Hibiscus tea</i>	3.5	<i>Hibiscus flowers, ginger root, rosehips, licorice root, lemongrass, orange oil.</i>
<i>Green tea</i>	5.87	<i>"Rishi" Jade Cloud spring green tea</i>
<i>Green tea</i>	5.86	<i>"Rishi" Jasmin flowers, green tea</i>

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<i>Black tea</i>	4.93	<i>"Rishi" Earl Grey black tea, bergam.oil</i>
<i>Double coffee</i>	5.12	<i>Water for it pH = 7.3</i>
<i>Cocoa</i>	5.73	<i>Grind cocoa grains (water pH= 6.13)</i>
<i>Cocoa + honey</i>	5.50	- " -

Animal products

<i>Produce</i>	<i>pH</i>	<i>remark</i>
<i>Whole milk</i>	6.72	
<i>Steamed milk</i>	6.75	
<i>Yogurt</i>	4.12	<i>"Fred Meyer" Carb master - cherry</i>
<i>Yogurt</i>	4.17	<i>"Tillamook" lowfat – blueberry.</i>
<i>Sour cream</i>	4.33	<i>"Fred Meyer" reduced fat</i>
<i>Beef</i>	6.41	<i>"Fred Meyer" Lean sliced beef (processed, pressed)</i>
<i>Beef</i>	5.7	<i>"Ledbetter" Beef tenderloin filet</i>
<i>Boiled beef</i>	6.05	--- " --- (20 minutes)
<i>Beef tea</i>	5.80	
<i>Beef Grilled in</i>	6.08	<i>microwave for 8 min. at full power (750W)</i>
<i>Egg's white</i>	9.0	
<i>Egg's yolk</i>	6.0	
<i>Gelatin</i>	5.13	

Changes of Water Colligative Properties in Distillation and Filtration Processes.

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08/12/2010

Abstract

The results of the demineralized water distillation, filtration and evaporation processes experimental studies are presented. Influence of CO₂ on water pH level during these processes was checked. It was shown that replacement of air with nitrogen gives the same readings of pH, and both distilled/filtered and residual waters change pH level and boiling/freezing points during the process. Hypothesis is discussed that the real reason for these changes is proton's high mobility and small size that allow its easy evaporation from the bulk water and penetration through filters in the process of filtration. Redistribution of excess protons concentration during evaporation process causes change of water specific latent energy and might be a real cause of colligative properties change of both residual water and condensed vapor/filtered water. Enriched with excess protons water vapor from the Earth's surface can transfer positive charges to clouds, causing formation of a huge potential difference from the atmosphere to the ground.

Introduction

Water purification using water distillation and reverse osmosis (RO) filtration is widely used in chemistry and biology for scientific observations. Both of these processes become important nowadays due to remarkable pollution of natural

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drinking water sources. It was noticed that both of these processes change water pH level and this feature was attributed to CO₂ influence.

It is also necessary to remark that formation of the excess proton in water and its behavior attracted attention for more than two centuries, beginning with the publication by Grotthuss in 1806 of the mechanism by which an excess proton or “protonic defect” diffuses in liquid water through the continuous formation and cleavage of covalent bonds^(1,2,3,4). A wide review of the Grotthuss mechanism development and use in different studies was made by Samuel Cukierman⁽⁵⁾. But still it does not cover the whole scope of interest to role of protons in solutions.

It is believed that protons in water exhibit mobility exceeding those of other simple monovalent cations, and that an excess proton is able to diffuse throughout the entire hydrogen bond network of water at a rate much exceeding conventional diffusion. And it may be easily understood just taking into account that formation of proton covalent bonding to a water molecule shall cause emission of an excess energy in the form of a photon in a wavelength range of about 270 nm. This photon in turn can cause cleavage of covalent bonding from the same or a neighboring molecule. Thus, once created in water, an excess proton can prolong its life for some time until meeting an anion and this may play remarkable role in many chemical and biological systems.

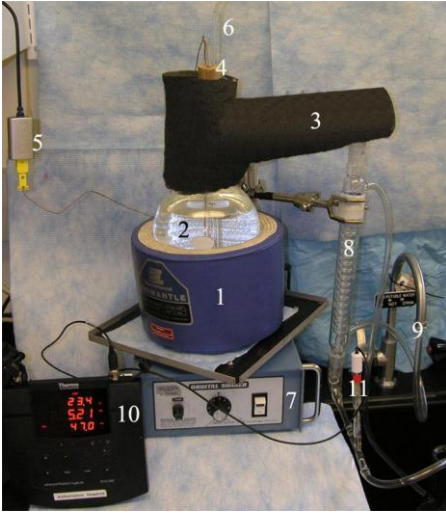
Many sophisticated methods are used to study the phenomena nowadays such as fluorescence spectrometry, ultra-fast infrared spectroscopy and others. They give very good evidences of the mechanism at work, which can be used further for deriving remarkable conclusions from simple observations based on measurements of hydronium concentration in water with pH meters.

Experimental studies

To check influence of CO₂ on water distillation process, studies of the process were produced using experimental set-up, which consists of the following elements (Fig.1):

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1. Heater designed to handle two liters flask,
2. Flask with a branch (3) at the top,
4. Flask plug with two glass tubes inserted. One for nitrogen supply (6), and another for water sampling. And also a thermocouple enclosed in sealed glass tube connected to a computer (5).
7. Stirring device.

8. Condenser with glass tube helix placed into a glass tube of bigger diameter serving as a cooler with tap water (9) flowing through it.

10. pH-meter with electrode (11).

During the process of distillation water samples of both condensed distilled and residual water were taken six times after formation of 250–300 ml of distilled water each time. First measurement was made before the process of distillation. Measurements of distilled water pH require thorough stirring since water tends to construct complex clusters around the electrode, causing inaccurate readings and instability. These clusters can be destroyed mechanically (by stirring) and thus average distribution of H^+ ions can be measured.

The flask was filled with 2 liters of water that was demineralized using three passes through reverse osmosis system and further exposed to UV light from mercury lamp (further referred to as Demineralized Ionized (DMI) water). All measurements were made, using Thermo scientific Orion 350 pH meter (10) with H^+ sensitive electrode. Electrode: 8220BNWP PerpHecT ROSS combination pH electrode with glass body, micro tip and waterproof BNC connector (11).

The results of the measurements are shown on the graph fig.2

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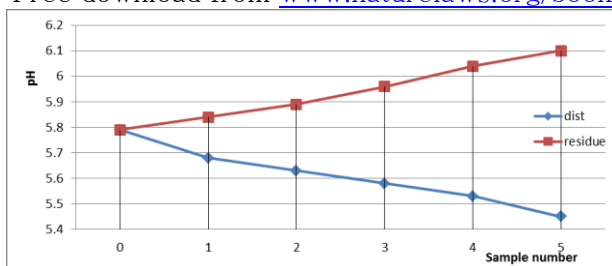


Fig. 2

The graph shows change of pH level of both distilled and residual water during distillation process. This result was a little bit puzzling and was attributed to the influence of CO_2 in the air and dissolved in the water according to the reaction $2\text{H}_2\text{O} + \text{CO}_2 \rightarrow \text{H}_2\text{O} + \text{H}_2\text{CO}_3$ (carbonic acid) $\rightarrow (\text{H}_3\text{O}^+)$ (hydronium ion) + (HCO_3^-) (bicarbonate ion). But there was still something strange in the function shapes.

Why CO_2 influences only distilled water? To check the level of CO_2 influence the following experiment was performed.

First, the air in the flask was purged for fifteen minutes with nitrogen gas coming from the glass tube in the plug (fig.1 (6)). Then water in the flask was exposed for one hour to vacuum of 370 mm of mercury level pressure. During this time the flask was stirred thoroughly (fig.1 (7)) for one minute every fifteen minutes to remove gases adsorbed to the walls. Then vacuum was replaced with nitrogen again and the process of distillation began by switching on the heater. This procedure removed most of the CO_2 from the system.

The results of this last measurement are shown on the graph fig. 3.

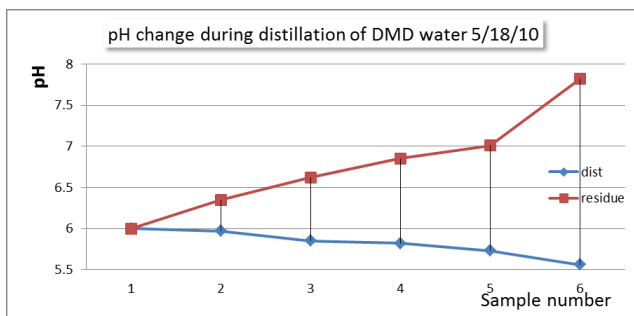


Fig. 3

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As we see there is no remarkable difference between graph 2 and graph 3. So it became evident that the CO_2 did not play a crucial role in the boiling process. Thus the supposition came that major role belonged to excess protons high mobility, and the boiling process just showed that concentration of free protons in residual water became hundred times lower than in distilled water at the end of process and the boiling remarkably reduced concentration of free protons in residual water.

Additionally, measurements of boiling and freezing points of distilled water and residual water showed some differences. After boiling out of more than three quarters of initial 2 liters volume (when 400–300 ml remains) the boiling point of residual water rises by three degrees by Centigrade (to about 103°C). Measurements of freezing point were made using water crystallization observation in a glass chamber with the distance between walls of 1 mm, placed into polarized microscope. These observations show that distilled water freezes at a lower temperature (of about three degrees by Centigrade).

It also gave basis for the assumption that the reason for difference of residual and distilled water physical properties is caused by the fact that process of distillation removes excess protons from water, causing decrease of the overall kinetic energy of residual water at a given temperature.

To check this hypothesis there were several other experiments produced for different types of water.

The same distillation process but using water from Seattle city supply system in BIOE UW building shows the following results: (fig. 4.)

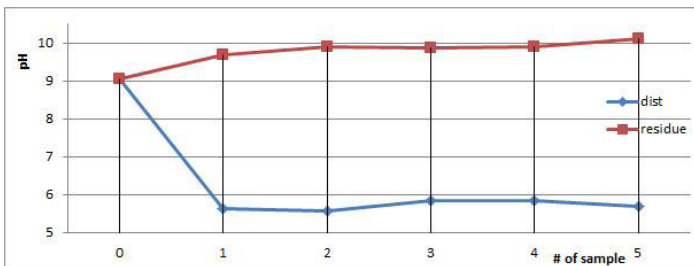


Fig. 4

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Thus the difference between condensed distilled water and residual water becomes evident even at the first stage of distillation process.

Further evidence of the fact that a vapor removes free proton from water was obtained using daily measurements of DMI water pH level. Measurements were made every day during two weeks beginning 30 April 2010 (fig. 5) using the following samples:

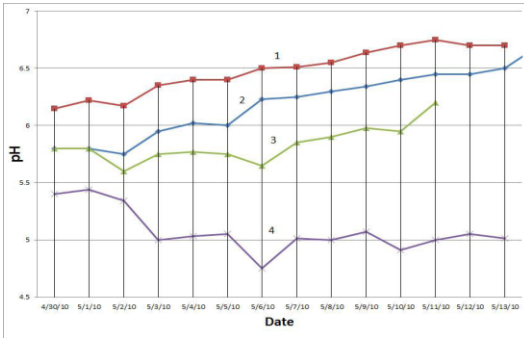


Fig. 5

1. – boiled DMI water kept in 200 ml open beaker in a light tight metal box, which allows free evaporation from the beaker. 2. – fresh DMI water in 200 ml open beaker in the same metal box.

3. – DMI water in 200 ml open beaker kept exposed to light on a laboratory shelf water

4. – DMI water kept in a closed plastic tank exposed to light in the laboratory. All samples were taken from the same source of DMI

First curve shows changes of pH level of sample 1 water that was boiled for three minutes. This graph shows difference of pH level between sample 1 and sample 2, which was caused by short rise of temperature to boiling point. Then this boiled water was left for free evaporation at a room temperature for two weeks and shows slow increase of pH level from 6.2 to 6.7 (curve 1).

The same happens with sample 2 (curve 2). Both functions have similar shape. This shows that free evaporation in the dark also removes free protons from water through slow evaporation.

Evaporation of water exposed to bright fluorescent light in the laboratory coming from commercial “hard white” fluorescent tubes also removes free protons, but light slows

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down the process and occasionally may restore the level of water dissociation (curve 3).

On the contrary, water kept in a tightly closed plastic tank for several months before beginning of measurements increases the level of dissociation and then keeps it at a constant level (curve 4).

Further evidence of the free protons in evaporated water can be extracted from measurements of pH level of water collected into two glass dishes during rains in Seattle in the University district. These measurements also always show water with pH between 5.8 – 6.3. This may support the hypothesis that clouds and water falling from clouds has higher concentration of free protons than residual bulk water on the Earth after evaporation.

This feature was always attributed to influence of CO_2 through reaction $2\text{H}_2\text{O} + \text{CO}_2 \rightarrow \text{H}_2\text{O} + \text{H}_2\text{CO}_3$ (carbonic acid) $\rightarrow (\text{H}_3\text{O}^+)$ (hydronium ion) + (HCO_3^-) (bicarbonate ion). But this reaction also raises an uneasy question of HCO_3^- ion presence while not dismissing excess proton presence. But a very simple consideration of the fact that CO_2 and vapor always coexist in the lower atmosphere and this reaction does not remove CO_2 from the atmosphere, so it has limited influence. Probably both reactions can take place and it is not clear which process predominates. The latter requires further studies. Besides, CO_2 presence shall influence rain water even in a much lesser degree.

The question remained also, why DMI water had such low level of pH, since it was never distilled. Measurements of initial, filtered using reverse osmosis, and residual waters were done, using different RO systems. All of them showed that residual water has higher pH level, and filtered water has lower pH level than initial water. These results also support the idea that protons penetrate through filters, anions remain in the residual water, and thus filtered water pH level is decreased and residual water pH level increased.

Discussion

First thing to pay attention to is certainly limitation of pH measurement accuracy and precision. The pH values might

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be affected by the low ionic strength (pH electrodes are calibrated at a particular ionic strength and low ionic strength solutions may give erroneous results)⁽⁶⁾. However, in all the measurements described, the ionic strength was similar, so different pH measurements could be directly compared. Additionally, intensive stirring allows good averaging of the reading, and thus the level of pH measurements error is reduced and does not affect the trend itself.

The second question is: does replacement of the air in the bulb with nitrogen and further application of reduced pressure (vacuum) eliminate influence of CO₂ on pH level? It is necessary to take into account that possible presence of CO₂ in water does not compromise the idea itself due to its low influence. Residual water increases pH level during boiling process, which means that level of hydronium ion is decreased. Presence of CO₂ in water, on the contrary, shall increase concentration of hydronium ions, and the rise of the temperature shall accelerate the reaction $2\text{H}_2\text{O} + \text{CO}_2 \rightarrow \text{H}_2\text{O} + \text{H}_2\text{CO}_3 \rightarrow (\text{H}_3\text{O}^+) + (\text{HCO}_3^-)$.

The physics of the processes is straightforward. The high mobility of protons and their low mass allow them leaving water easier and quicker than any other ion can do during the boiling process. The same happens during reverse osmosis filtration process — residual water has a higher pH level and lower hydronium ion concentration than filtered. The same factor should play a crucial role in changing colligative properties of distilled water, lowering its freezing temperature and increasing the boiling temperature of residual water.

These two last properties look strange at first glance. They seem to be specific features of mixing solutes with the water⁽⁷⁾. But these results can also be explained more or less correctly by the exchange of specific latent energy during the filtration/evaporation processes. Enriching water with protons increases intrinsic translational energy and thus enthalpy of water due to the high mobility of protons. At the same time the residual water has reduced entropy and thus has increased boiling point.

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More specifically, entropy is a logarithmic measure of the density of states:

$$S = -k_B \sum_i P_i \ln P_i$$

where $k_B = 1.38065 \times 10^{-23} \text{ JK}^{-1}$ is the Boltzmann constant; the summation is over all the microstates, the system can be in; the P_i is the probability for the system to be in the i^{th} microstate. The decrease of probability range level decreases entropy of the system.

The factor that vapor is enriched with excess protons, may play a very important role for the life on the Earth. Thus evaporation from the Earth surface leaves an unbalanced negative charge in the form of hydroxide ions in ground water. This might be the real reason for the charge difference between the Earth and positively charged clouds that take place in nature, as described in the famous lectures on physics by Richard Feynman⁽⁸⁾. Feynman attributed this charge distribution and formation of a huge potential difference to nuclear radiation from the Earth and radiation from the sun. This assumption has some problems of atom dissociation, which always gives both anions and cations (it's not clear how charge difference is formed); however, the hypothesis of excess protons in water vapor can easily explain the phenomenon of Earth-clouds electrical charges difference.

Furthermore, humidity level is a basic atmospheric property, which is always observed and reported. According to the statistics, people living in the mountains and in the countries with high humidity levels (like Cuba) live longer. It may be explained also, among other reasons, with the difference of free protons quantity they inhale during their lives. Additionally, people in the mountains drink naturally distilled water from the mountain rivers, enriched with free protons, which may play a role in the body metabolic process harmonization.

Plants also filter water, which they suck from the ground. This process of filtration can enrich water in the stems with excessive protons, and thus change its properties, lowering the freezing point and enabling plants to survive

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during severe frosts down to -25°C . Besides, many plants produce antioxidants in their fruits and leaves, and excess protons can take part in this process. This filtration factor might also play a remarkable role in animal physiology as far as animals use a filtration process in kidneys.

These hypotheses, based on the observations described, require detailed studies, attracting with the simplicity and promise far reaching consequences. Getting scientific evidence and being aware of this important feature of water may have a remarkable influence on future refinement of drinking water. For example, a simple reversal of the sequence of the two processes, namely water filtration with reverse osmosis and followed with UV light treatment during purification process (putting UV treatment on the first place) can remarkably change water properties and influence on human health, while still ensuring water purity and safety. That is why these studies are so important and require further attention.

The most crucial question here: Is there a possibility to make these far reaching conclusions using simple pH measurements? The first advantage of pH measurements is that they are, probably, the least destructive (if compared to other sophisticated methods that require water molecule excitation), and give a more or less realistic picture of the processes under observation. The second advantage, they give broadly averaged information about substances under consideration. The most important pitfall: they require assumptions that can be derived from a wide range of knowledge about water and its structure obtained from previous, more complicated, studies.

Acknowledgments

The author expresses his gratitude to Professor Gerald Pollack whose invitation and ability to work in the laboratory he conducts in BIOE UW allowed these observations to be made during free time (Saturdays and Sundays) in April and May 2010, along with the fulfillment of major program studies.

Special thanks to Professor Martin Chaplin, of London South Bank University, whose valuable remarks and discussions helped improve the logic of this paper.

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Guiding Ideas of Nonsectarian Humanity

Development of human civilization on earth remarkably depends on human relations on all levels of the society beginning from families and up to countries and continents. Prosperity of the human civilization depends on every participant and is defined by the level of spiritual development of everyone. Below one can find collection of progressive ideas, expressed by different people in different times, which can help to create a warm, cozy, safe home for all the inhabitants of the planet, free from ignorance, greed, hatred, and other afflictive states, if people can comprehend and follow them.

These guiding ideas are well known to people for centuries and centuries. They can be found in all religions of the world. They were preached by the people whose names have been kept in the history of human civilization. These people are: Moses, Hermes, Zoroaster, Lao Tzu, Confucius, Buddha, Socrates, Plato, Jesus, Muhammad, and by many others later on.

Positive thinking may be found in the Ten Commandments, seven of which are addressed to a person: Honor your father and mother; You shall not kill/murder; You shall not commit adultery; You shall not steal; You shall not bear false witness against your neighbor; You shall not covet your neighbor's wife; You shall not covet anything that belongs to your neighbor.

Briefly, they are formulated in the Golden Rule: One should treat others as one would like others to treat oneself (positive form). One should not treat others in ways that one would not like to be treated (negative form, also known as the Silver Rule). To bring the Golden Rule to life we need thinking about others, trying to put ourselves on their places and learn whether or not our deed can be perceived as good, if we were in the other's place.

Modern Nonsectarian humanity goes further: generate good deeds around us without the desire to extract material benefits, and they will return to us in the form of a good re-

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sponse from others. Be honest and friendly toward others and the world around will become safe and welcoming. Nothing is as cheap for us and valued so highly by others, as politeness and benevolence. Be open-minded to all people around you. Always keep your promises, and if some conditions prevent you from doing this, explain the reasons to the one who expects something from you based on your promise.

One should be careful of nature that gave birth to all of us; study its laws and follow them strictly. Violation of the laws of nature, its pollution, and destruction is equal to sawing off the tree branch on which one sits. Maintain cleanliness and order in your surroundings, and your life will be comfortable and rational because people will reply with the same.

Social justice in the society consists of two major components: even distribution of money and knowledge. There is no way to redistribute money and property in the society evenly, but there is a good way to make everyone a better provided person by offering such value as knowledge. As Henry Ford said: "If money is your hope for independence, you will never have it. The only real security that a man will have in this world is a reserve of knowledge, experience, and ability." That's why a truly democratic society must think about affordable and compulsory high level education for every member of the society.

Continually learn from life; do not be lazy acquiring the knowledge accumulated by previous generations; become competent in your field of expertise, in the affairs of what society needs, forgetting about personal benefits and career. In this way, the world around us will become knowledgeable and competent. Society always appreciates erudition and unselfishness, and answers with the same. Help those who are weaker and less developed to accumulate the skills they need for life; as far as arming a person with knowledge, one provides a real livelihood. Knowledge is the true gift that does not wear out and will be remember forever.

John Adams often pondered the issue of civic virtue. In a letter to political writer Mercy Otis Warren in 1776, he said, "There must be a positive Passion for the public good, the

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public Interest, Honor, Power, and Glory, established in the Minds of the People, or there can be no Republican Government, nor any real Liberty. And this public Passion must be Superior to all private Passions. Men must be ready; they must pride themselves, and be happy to sacrifice their private Pleasures, Passions, and Interests, nay, their private Friendships and dearest connections, when they stand in Competition with the Rights of society."

Adams worried that a businessman might have financial interests that conflicted with republican duty; indeed, he was especially suspicious of banks. He decided that history taught that "the Spirit of Commerce ... is incompatible with that purity of Heart, and Greatness of soul which is necessary for a happy Republic."

Do not make your life elitist; be accessible to all and treat all in the same way, and we will live in a truly democratic society. Discard the excess of luxury in everyday life for urgent needs of the society. Invest in the development of public institutions and our wealth will multiply, since they be added to the wealth of the society in which we live, which we use on an equal basis with others.

By the words of Christ Jesus in the Sermon on the Mount: Matthew 6:24 (Bible) "No man can serve two masters: for either he will hate the one, and love the other; or else he will hold to the one and despise the other. One cannot serve God and mammon." The main motive of getting money should be care of people and development of human civilization. Money obtained in violation of the Golden Rule and following the basic precepts by fraud and violence, put a heavy burden on the human soul in accordance with the Law of Compensation, poisoning the mind with the fear of retaliation by the cheated.

Be honest in everyday relationships and business, and life will be safe and comfortable for all, because honesty is a material object that we all want to enjoy every day. It's impossible to build a developed society without complying with scrupulous fairness to others, as far as it is the main constructive material of a democratic society. Deceit created

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nothing ever; still, society spends remarkable money to combat frauds. Twisters, getting instant profit, take away the future from themselves and their children.

Take care of personal harmonious development, combining physical and mental work, avoiding excesses of laziness and overeating. Any excesses are harmful to mental and physical health. Austerity helps to develop positive thinking. Experience shows that following the tradition of veganism helps to maintain a good mood, health, and performance for years to come.

Many outstanding scientists in medicine of different epochs follow Hippocrates's advice: Let food be your medicine. The vegetarianism shows amazing results in curing almost all dangerous diseases that cause millions of deaths every year. It follows the traditions of naturopathy well known in the western world.

Obesity threatens the world not less than weapons, destroying health and ability. A weak person is often governed by laziness. According to Greek philosopher Plato: "The first and best victory is to conquer self; to be conquered by self is of all things most shameful and vile." (Laws, Book 1). Everyone needs this victory over laziness and inertia on a daily basis without interruption until death. A short stop may lead to setbacks. Such is the nature of human existence: the fittest survive. The human shall fight every day against invasive vices.

All great religions have one heart, similar to mystical truths, and share understanding of esoteric traditions containing principles of Hermeticism. According to the seventh principle of Hermeticism — the Principle of Sex, all things have two beginnings (sexes), and any creativity is a result of the interaction of these two principles. In accordance with this principle, the interaction of the sexes is a very important part of human civilization, and the inherent nature of libido, that promotes normal functioning of procreation, helping to develop the law of Love and Brotherhood on the Earth.

But the world around us is not always that friendly. What to do if one encounters hostility from the boss, col-

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league, friend or neighbor? Never lose your balance and presence of mind; do not respond with aggression. Try to assess the circumstances of the situation calmly. Analyze the motives that caused the unfavorable attitude toward you. If possible, ask the initiator of the malevolence about the reasons for the aggression. Use the language of friendly questions that may lead to fruitful discussions. Calm discussion of a conflict may help to achieve mutual agreement without much effort. Never criticize the actions of others without providing alternative solutions, leading to better results.

How not to lose balance and presence of mind when dealing with aggression and anger? Humanity developed many techniques of self-control and presence of mind over the years. The most common and popular are the methods of Hatha Yoga. However, one's positive thinking is always the main basis of peace of mind and presence of mind. One can develop it studying the most ancient teachings such as Vedas, Buddhism and Jainism in India, Taoism in East Asia, Mayan civilization in Central America, as well as Christianity that represents about a quarter to a third of the world's population, and Sufism in the Islamic world.

Consider the fall of aggression upon you not as guilt, but as a human disaster of the one who exhibits it. Recollect Greek philosopher Socrates, who believed that all virtue is knowledge. He also believed: wrongdoing is a consequence of ignorance, and those, who did wrong, knew no better. Be compassionate; try to help the aggressor get out of trouble. One's calm and persuasive response, based on the world's major religions and philosophies, will have a much greater impact than a reciprocal aggression that might only heat up the conflict. If the initiator of aggression does not hear the voice of reason and continues, the last resort to stop the conflict should be cease continuing.

At the core of all conflicts are ignorance, greed, vanity, and disregard of the interests of other people and society. How to get rid of them and stop them? An approach to this is described in the Bhagavad-Gita. In the Western world, at the international level, suspension of friendly relations and isola-

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tion of the dictatorship is used as pressure on an aggressor. At a household level, the suspension of relations with an opponent is to give time to cool down and think, and often produces positive results.

If time does not bring positive results, it is better to put a relationship onto a very formal path, open to discussions when the opponent is ready. Once caught in the isolation of others, aggressive people might be tempted to doubt the correctness of their position and behavior. Never avenge an insult inflicted. According to the Chinese thinker Confucius, "Before getting on a path of revenge, dig two graves." If your constitutional rights have been violated, the best way to restore them is appeal to a jury or court.

History of human civilization is full of bloody pages of the destruction of nature and society. In most cases, aggression was based on a perversion of the spiritual teachings of the world and their use to satisfy personal malevolent interests as an excuse to seize the wealth of other people and nations through war and murder. The Crusades in the middle Ages and the wars of jihad in our time can serve as sad examples that lead to mass murder. Marx's theory of the dictatorship of one class, and the idea of superiority of one nation over other nations by Adolf Hitler, led to serious bloodshed in the 20th century. Craving wealth and power without labor and creation of wealth available to all on an equal basis, is at the core nature of any aggression.

The history of Russia in the twentieth century is a sad example of the triumph of the Leninist philosophy, which rejected the parliamentary development in 1917, calling for weapons and murder to build a happy society. The era of Stalinism, following the 1917 revolution, showed what results such a theory can bring. Russian society will long bear the burden of bloody fratricidal times in souls, which led to the development of criminal corruption on the borderline between 20th and 21st centuries. Removal of the karmic debt, stopping the destruction, and acceleration of the development are within our ability. We need only our good will — every one of us without exception.

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It's high time to unite all nations and religions, bringing together all parties, churches sects, and denominations. It's time to realize that humankind has one root and one house for life; if this one is destroyed, no another will be available. Without overcoming destructive disagreements and controversies by developing common approaches and plans, it is impossible to build an advanced civilization. Following the wise philosophies of people called prophets, will help to fill life with joy, creative work, and positive thinking, providing civilization with true meaning and bringing joy and pride for the past.

If one has been following the above simple rules, one could be called a long-time nonsectarian humanitarian. Try to spread the information about the existence of these ideas to those who do not think about these ideas; help them to evaluate their actions and thoughts. Educating our children with the ideas and the spirit of nonsectarian humanity is the best contribution to their bright future.

According to Jesus: Matthew 5:13: "You are the salt of the earth. But if the salt loses its saltiness, how can it be made salty again?" Matthew 5:14: "You are the light of the world. A town built on a hill cannot be hidden." Matthew 5:15: "Neither do people light a lamp and put it under a bowl. Instead they put it on its stand, and it gives light to everyone in the house." According to Confucius: "It is easier to light one small candle than to go on cursing the darkness."

Acknowledgements

The author would like to express his deep gratitude to:

Dale Palmer, American lawyer and historian, the author of "True Esoteric Traditions", whose long research in life of Jesus the Christ and attempts to find his traces on the Earth, summarized in the book, remarkably influenced my views and approach to the history of human civilization.

Kent Bakke, the president of LaMarzocco USA company, for his moral and financial support and participation in this and other projects of mutual interest, without who this book would hardly ever appear.

Stefanie Ruth Kleinhenz, Producer/Director of Satellite Pictures Pty Ltd., Australia, for her friendship, interest to Galina Shatalova's life and approach to healing, and interesting discussions of health issues

Eldon and Sherry Ploetz for their long lasting friendship and humanity

.

About the author:



As the reader knows, Naturalist is my nickname that I have chosen to emphasize my inner convictions and inclinations and even my occupation. My last name is Danilov and I am a physicist of Russian origin, with majors in physics of electromagnetic fields and later on in biophysics.

My health problems also made me interested in biology and biochemistry. This book is the result of lifelong observations of my health conditions and thinking about what might influence it.

Interest to physical chemistry of water brought me to the US in January 2010 and this move opened an ability for [interesting observations](#) . Experience and skills, acquired during more than thirty years in experimental physics, armed me for design and production of complicated research works in many fields of natural science. And certainly my attention is attracted now to the most urgent needs of the society: renewable energy production and overcoming health problems.

Major Fields of my interests include:

Health: a) observation of human microbiome behavior; b) restoration of natural inborn morphology of the body using holographic imaging;

Renewable energy: a) portable vortex hydropower stations of riverside deployment with no disturbance to the natural flows; b) portable floating hydro and air power stations using flutter effect; and vehicles with electric propulsion.

Strong health and mobility, achieved through vegan diet and natural lifestyle, give me a hope to implement at least the simplest projects. The only thing, needed for this, is adequate financing. In this sense, every book bought by the reader, gives me an ability to survive longer and successfully continue my design and research work. Thank you for your interest and support.