

# Abstract of Contents

## **Reflections on the Characteristics of National Temperament Sources of Sustainable Development**

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### **Abstract**

The speed of events in our time is such that even a sharp imagination cannot follow. We have been worried about the occurrence of drought in the country for several years! But many times during these days of worry, torrential rains poured down from the sky and caused a lot of destruction! It has been a long time since the corona disease appeared and has made many people go to another country! Earthquakes have been occurring for many years due to their nature and bring fear, destruction, and killing. The phenomenon of micro-particles is also an uninvited guest that has been added to these events and sometimes casts a shadow on parts of Iran and annoys Iranians! We pass over some of these as if they are all the achievements of nature, and of course, some can be tamed. What can be said about other developments? I mean political, social, and educational developments. Which one should we start with? From the constitution, which failed! And the first side that came to work! And the one that didn't lead anywhere. From the oil nationalization movement and the Mossadegh government, which happened and renewed hopes, and left with the coup. From another era that started and showed the gates of a great civilization, and then collapsed. From the bright days that began after the Islamic revolution, it was not long before it was contaminated by the darkness of colonialism and Saddam's wickedness, and then many destructions, displacements, killings, and looting occurred. From the changes that appeared many times in the country's education system after that, and the sudden quantitative expansion in the country's higher education centers and its consequences! These developments and transformations, some political and social, and some educational, happened in a time of nearly a century, consecutively! But none of them were solved! Why? In the author's opinion, the solution should be found in the behavior and actions of Iranian people, both small and big rulers, and ordinary people, in some times, whether in the past or the present! And that is nothing but the «change from base» feature. In this article, we will examine some of the components of this feature.

**Keywords:** culture, science, law, sustainable development, basic sciences, education, legalism

## **Education for Sustainable Development: Understanding the Effectiveness and Credibility of Technology in the Shadow of Education**

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### **Abstract**

Many details need to be considered to realize the technology. The confusion caused by the multiplicity of these factors and not paying attention to them is disastrous. Technology is the basis of the country's macro and long term plans. It is not possible to achieve these goals without paying attention to the category of technology. The country's large technological programs in the fields of security, economy, social welfare, and defense require two basic aspects of internal effectiveness and external credibility. The first aspect guarantees the social stability and political integrity of the country, and the second aspect guarantees the geographical integrity and national security. Therefore, it is very important to have a proper understanding of the technological situation of the country. Examples of the existence of basic technologies can be seen in people daily life. On the other hand, the growth of industries and technologies has been based on mathematical achievements, so that the existence of basic mathematics is one of the most important criteria for the effective existence of technology. The serious encounter of a society with the needs of basic mathematics determines the current situation of technology of that country, makes it effective, attainable, and reliable. In the scope of this exposure, originality is due to the vision, attitude, and performance of mathematics in the country. It is in this way that the growth and development of technology and progress will be realized. Directly, general mathematics and current basic mathematics in the country, by determining the level of effective, durable, and accessible technology in the country, will shape the framework of micro and macro policies of the country in all temporal and geographical scales.

**Keywords:** effectiveness, credibility, technology, mathematics

## **Understanding the Future in: Introduction to Anticipation Studies. Chapter 4, pp:74-59. Springer 2017**

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### **Abstract**

Futures Study is the field that during the past 60 years has more than any other systematically dealt with the future. This chapter presents anticipation as the third level of futures studies, after forecast and foresight modeling, and connects anticipation with related issues such as utopias and future-generating research. Futures study is the field that lies between the essential unknowability of the future and the effort to use the future for decision- and strategy-making in the present. During the past 50 years, futures study has assumed an increasingly explicit professional

Nature. Practices have become more tailored to the needs of customers, and methods have become more robust. After decades of being characterized by diminishing interest in the theoretical underpinning of futures study, the past few years have seen the onset of a new concern with the foundation of futures study. Three layers of of future studies, forecasting, foresight, and anticipation are exploit as tripartite distinction.

**Keywords:** facta and future, futures in the making, dispositions, utopia, foresight, forecast, anticipation, futures literacy, future-generating research

## **Future Studies: the Place of Science, Technology and Innovation in Iran, the Region and the World**

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### **Abstract**

Future research is the systematic study of possible, probable and preferred futures so that with foresight the current situation can be directed in the direction and direction of a desirable future. In other words, the prerequisite of future research is to know the current situation, describe the desired situation, be aware of the capacities and needs, and explain the solutions, strategies, policies and executive-operational plans towards a desirable future. Progress in any field is not possible without planning and foresight, and progress in today's and future world, which is based on science, knowledge and technology, is not excluded from this. In this article, while examining the current status of Iran's science, technology and innovation, based on the data provided in the reports of the Islamic World Science Reference Base, Iran Research Institute of Science and Information Technology (Irandoc) and UNESCO's scientific report towards 2030 from Iran, with indicators Science, technology and innovation have been analyzed in high-level documents, including the comprehensive scientific map document in the perspective of 1404 countries, the level of progress and the position of Iran in the region and the world. At the end, some challenges of knowledge and technology of the current and future foundation of the society - which can only be solved with the powerful tools of science, technology and innovation - have been presented so that the necessary arrangements for them can be thought by those in charge for a better future.

**Keywords:** future research, science, technology, innovation, university, industry, Ministry of Science, Ministry of Health, government

## **Future of Chemicals Science and Technology in Iran**

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### **Abstract**

A brief historical perspective is provided on the inception of modernity at the beginning of the 20th century in Iran as it relates to science and technology. Developing countries' commitment considerable resources to those sectors in which they have comparative advantages. Iran's most important comparative advantage is in the chemical industry. Proven oil and natural gas reserves rank Iran in the top 5 in the world and coal and minerals are also abundant. Because of a long industrial tradition in oil, gas and petrochemicals, almost all equipment needed in the chemical industry are manufactured domestically. Most importantly, nearly 50% of Iranian scientific and technical literature published in international journals are in chemistry and related fields, demonstrating the country's highest human resources. In short, the 3Ms required for sustainable industrial development (manpower, material, machinery) are available in abundance for the chemical industry in Iran.

Iranian petrochemical industry has experienced continuous growth in the past 60 years. However, little or no attention has been paid to the production of organic building blocks (OBBs) from petrochemicals, coal and mineral resources. Compared to crude oil and natural gas, OBBs have much greater added value and are used in all industries. In fact, Iran imports billions of dollars of solvents, OBBs and their more advances

derivative as insecticides, herbicides, fertilizers, resins, polymers, active pharmaceutical ingredients (APIs), excipients, drug products, advanced material, detergents, additives and preservatives etc. when Iran should be a major exporter of these chemical commodities.

Mostly based on the rhetoric of "self-sufficiency", Iran's economic planning in the past forty years has been for the most part pedestrian in approach. However, because of her great potential in the chemical industry, Iran can quickly develop into a global player in the production of OBBs by prudent planning, good governance and analysis of the realities of the global and domestic markets. To this end, the establishment of the Ministry of Chemical Industries (MCI) is proposed to guide Iran's potentials in human resources, raw material and machinery in the production of OBBs and their advanced derivatives. This approach played a pivotal role in the industrial development of South Korea, China and India. Finally, a roadmap for short-, medium- and long-term planning of the MCI is proposed.

## **Foresight in Research Method: Computing Science as the Third Branch of Research**

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### **Abstract**

From the 17th century to the end of the 20th century, two methods have played a dominant and decisive role in the researches related to basic sciences and applied sciences: the theoretical/analytical research method and the practical/laboratory research method. The purpose of these researches is to obtain the laws governing the structure and function of biological and non-biological matter, the laws governing nature and its evolution on very small and very large scales, the laws governing the origin of life and its evolution, and the laws governing political life. It has been socio-economic. The result of the researches led not only to the understanding of the current situation in the mentioned areas, but to the possibility of predicting their development in various future conditions. At the end of the third wave of development at the end of the 20th century and its continuation in the fourth wave of development in the 21st century and the emergence of huge and powerful computers and the emergence of unparalleled information science and technology, a new complementary science called computing science with two traditional research methods The previous one was added. By relying more and more on this new science, which has entered all branches of basic sciences, medicine, engineering, economics, and social sciences, the structure and function of some of the most complex biological and other systems can be studied through powerful computer-based simulations. They simulated their current and possible future biology and performance and studied them very carefully. The application of this new science, especially in the fields of modern sciences and technologies of this century, i.e. nanotechnology, biotechnology, neuroscience (brain structure and function), medicine and molecular genetics, design and engineering of advanced and intelligent materials, performance recognition The dynamics of complex systems and environmental issues have been very impressive. In this article, computational science has been introduced as one of the important pillars of foresight in the field of research, and various examples from different fields have been presented.

**Keywords:** computational science, computer simulation, numerical modeling, statistical mechanics, nanotechnology, state space quantum mechanics

## **A look at the Future of Biomedicine and Health Challenges**

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### **Abstract**

Foresight in the field of health and medical care has always been of special importance, and today, due to the complexities of modern life and the costs caused by this lifestyle, the complications have doubled. In the field of health, to address the challenges and find practical solutions, foresight is done with the help of common methods such as the Delphi method or elite panel, and the goal is to find the right solution to solve the problems of the health field with the help of biomedical knowledge. Biomedical science solves health challenges by providing innovative methods, and its most important goal is to increase the quality of life and increase human lifespan. One of the most important challenges today for biomedical researchers and researchers is the challenges in the field of cancer treatment, infectious diseases, cardiovascular diseases and diabetes, which due to the unhealthy lifestyle of people in the modern world of these fields and related problems. is an increase For example, society's dependence on virtual space and reduction of daily exercise, use of prepared and semi-prepared foods due to the high workload of people in modern society, the incidence rate of cardiovascular diseases, types of cancer, diabetes, problems related to bones and joints Increased movement. Sometimes, the simultaneous occurrence of these diseases in one person makes the community of biomedical researchers provide treatments that aim to effectively treat these diseases with the least amount of side effects on the health of these people. In this article, some of these health challenges and possible treatments provided in this field have been examined with the help of the knowledge of biomedical researchers.

**Keywords:** biomedical science, foresight, health care challenge, science and technology.

## **The Concept of the -15 Minute city and its Challenges in the Post-Corona Era**

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### **Abstract**

The -15minute city is an urban planning idea that refers to access to services and job opportunities in 15 minutes. Experts have devoted the idea since the Covid19- outbreak of, but in practice, many challenges made it almost impossible to be operational. Considering the necessity of presenting the subject and novelty in the scientific literature, there is a lack of integrated attention to scientific critiques of the -15minute city concept. In this article, first, we give an overview of the existing literature and providing a conceptual definition, then the origin and theoretical origin of criticism various dimensions of planning, economic, technological, socio-cultural and physical-physical are discussed. Studies show that the spatial results of this concept, can lead to increase social inequalities in the city. Criticisms of the -15minute city can be categorize into various economic, social, technological (digitization), and physical dimensions. A number of basic components of a -15minute city make it ideal and out of reach. Expansion of smart services, social classes distance reduction, major reform of the pedestrian and bicycle network, harmonization of housing prices throughout the city and the possibility of acquiring it near the workplace, creating sustainable social security within neighborhoods, equitable distribution of job opportunities in Different aspects of the city, abandoning the concept of zoning in comprehensive plans, improving the technical knowledge of smart city users and eradicating poverty and social deprivation are some of the major challenges to make it operational.

**Keywords:** -15minute city, urban accessibility, walkability

## The Earth, Geology and Geologist

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### Abstract

According to astronomical observations, the planet Earth in the solar system is unique in the known universe. What actually makes Earth unique is the presence of a carbon-based life and an oxygen-rich atmosphere since 2700 million years ago. Life proliferation on Earth has shaped the evolution and diversity of biological species in the so called "biosphere" through what is known as the tree of life. The biosphere along with other three spheres i.e., lithosphere, hydrosphere and atmosphere interact within the framework of plate tectonic theory developed during the last quarter of the 20th century. However, human intervention in the Earth system, since late 20th and the first two decades of 21st century has reached a point that anthroposphere is now formally recognized as the earth's fifth subsystem. Since the Earth is a very old planet with 4600 million years of age, geologists have developed their own time scale i.e. "geological time scale" to describe geological processes in vast spans of time. In modern geological approach, geologists use integrated science combined with computer modeling to describe what the Earth has gone through in this very long span of time. Relying merely on field observation and laboratory experiments do not suffice to answer all geological queries.

This short article tries to shed light on what has happened to Earth in geological time revealed by new approaches including remote sensing and use of computer modeling and big data processing in modern geological approaches. The most geological challenge nowadays is to study serious environmental challenges caused by destructive human activities in all subsystems of the Earth.

**Keywords:** earth , geology, geologist, anthropocene

## Gravity: from Ptolemy to Hawking

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### Abstract

Gravity is the most general force in nature. Gravity plays a crucial role in the formation of the Universe and its constituent structures, including the Milky Way galaxy, the solar system, the earth, the origin of life, in maintaining the earth's atmosphere and the evolution of living organisms. The formation of the structure of living organisms and their vital functions, including growth, evolution and movement, also occur in the presence of gravity. In this article, we study the history of gravity from ancient Greece to the 21st century and its importance in the formation of cosmic structures and large-scale evolutions of the Universe. Then, we explain the different views about the nature of gravity. We will examine the connection between the laws of thermodynamics and gravity. In fact, the laws of gravity are the same as the laws of thermodynamics for the space-time system, on the large scales. In another approach, by introducing the concept of entropy force, we show that gravity is also a type of entropy force that originates from the tendency of the system to increase entropy. Therefore, the laws of gravity can be obtained from the approach of statistical mechanics, by accepting the principle of holography and the equipartition law of energy. Finally, on a more fundamental level, we show that the cosmic space is emergent as the cosmic time progresses. In this approach, by equating the volume change of the Universe and the difference in the degrees of freedom on the boundary and in the bulk, the field equations of the Univers can be obtained.

**Keywords:** gravity, spacetime, thermodynamics, holography, universe.

## **Research Ethics Moral Values in Science and Technology**

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### **Abstract**

Research ethics in common practice is a branch of ethics, including the rules and principles governing research; that is, it is aimed at preventing errors and ethical violations in the field of science. On the other hand, research ethics means compliance with rules such as avoiding plagiarism or bias in data analysis or data manipulation. But here I mean a more general concept; That is, anomalies that have a value aspect and occur in all theoretical and practical fields; It harms the long-term progress of science at the theoretical level or has practical harmful effects for humans and the environment. Science deals with the study of natural phenomena and ethics deals with right and wrong and good and bad in actions and behavior. But at the human level, these two intersect. That is, moral values can affect the line of research and scientific decisions of scientists. The well-being and comfort of the human society also depends on whether scholars observe moral values or not. In the last two centuries, great progress has been made in science and technology. But the new science has also led to much destruction. Because the forces of nature have been used to conquer nations and destroy the environment, and gaining power and wealth has become the main justification for spending money in some areas. Therefore, the question arises why, despite the predictions, in the second half of the 19th century and in the 20th century, the progress of science and technology has not led to the comfort of humanity at the general level? In response to this question, the view of some prominent contemporary scientists is that the worldview governing popular science should be changed, and a comprehensive worldview should rule over scientific fields that takes into account both ethical considerations and answers to all human concerns.

**Keywords:** research ethics, ethical values, principles governing research, misuse of science, worldview governing science

## **Historical Background & Perspectives of Two Achievements of Maryam Mirzakhani**

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### **Abstract**

In this expository, I adopt historical approach to explain part of the achievement of Maryam Mirzakhani on the volume of a kind of moduli spaces and its results in Theoretical Physics. In order to perceive the meaning of her works, having this view point for a general audience that finds the contemporary mathematics puzzling may be enlightening. Regarding this approach, without going to the technical details, I follow major developments of mathematics from the Ancient Egypt to the recent in order to make sense of them. In this article, we will see that the concept of volume is canonical in the development of mathematics and computing the volume of a new object is a breakthrough in the view point of mathematics and physics as well and whenever the contribution of mathematics and Physics was interactive, both inspire each other and fruitful for themselves.

**Keywords:** Maryam Mirzakhani, Riemann surface, Riemann metric, geodesic, moduli space, intersection theory, string theory



## **A Look at the Scientific Biography of Ahmad Zovil, Winner of the Nobel Prize in Chemistry**

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### **Abstract**

In this article, looking at the scientific biography of professor Dr. Ahmed Zoil, based on a book written by him, we will discuss his scientific efforts and personality dimensions. After trying to study chemical reactions in real time, Dr. Ahmad Zovil has carved out a new realm in science called femtochemistry, to study chemical reactions on the femto time scale (15-10 seconds). Femtochemistry made it possible to study the dynamics of invisible phenomena in the world of molecules and observe the breaking and formation of bonds and intermediate compounds of chemical and biochemical reactions, which makes possible a better understanding of these phenomena. He received the Nobel Prize in Chemistry in 1999 for his achievements. He is one of the Muslim scholars who has achieved this honor. Today, femtoseconds are used to study many phenomena, including biological phenomena (under the title of femtobiology).

**Keywords:** femtosecond, laser systems, muslim scientist, Nobel Prize in chemistry, measuring instruments

## **Academy of World Sciences (TOVAS) and Irans Place in it**

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### **Abstract**

The academies of the countries are composed of prominent national and international scientists and have diverse and effective functions in the field of culture, science and technology and play an essential role in the progress and sustainable development of the countries. The World Science Academy (TOWAS) as its name and goals suggest, was founded and established for the advancement of science in developing countries by benefiting from the capacities of all advanced countries. Although Iran is considered one of the rich countries in natural resources and skilled manpower and has made good progress in the production of knowledge and technology in the last few decades, but reaching the level of developed countries in the field of science and technology and production Knowledge-based wealth still has a significant gap. Part of this gap is due to the backwardness and dependencies of the past, and the other part is the lack of use of international capacities and capabilities. TAVAS or the Academy of World Sciences is one of the non-profit organizations that, according to its inherent goals and mission, tries to provide a platform for developing countries to use international scientific capacities and capabilities, especially from advanced countries. In this article, while introducing the Academy of World Sciences and its potential and actual capacities, the position of Iran in this non-profit organization is examined and presented. At the end, in order to achieve greater success in the country's scientific community, proposals have been made by the assembly of Iranian members of TAWAS (Tavasiran) by using the capacities of TAWAS. It is obvious that in order to achieve these successes and implement the suggestions, it is necessary to provide spiritual support and financial support through the mechanisms provided by Tavasik.

**Keywords:** Academy of Sciences, TOVAS, Tavasiran, science & technology, Abdul Salam.



## **Four Epidemics: Cholera, Monkey Poxvirus, Congo Fever and Polio An Overview of the Controversy of the Return of Infectious Diseases**

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### **Abstract**

In the last two decades, travel, trade as well as the growth of urban population have facilitated the spread of infectious diseases among the communities and increased the risk of death from these diseases. Although the advances in health and medicine have improved the preparedness of societies to deal with the serious pandemics; the limited access to health care, environmental degradation along with poverty, inequality and other social factors have created the conditions for emergence of new epidemics. In this review we have provided an up-to-date overview on the four serious diseases that cause major epidemics in the recent decades including Crimean-Congo hemorrhagic fever, monkey pox, cholera and Poliomyelitis and have given a brief explanation on the diseases, causative agents and mode of transmission.

**Keywords:** Crimean-congo, hemorrhagic fever, Cholerae, *Vibrio cholerae*, monkeypox, poliomyelitis (polio)