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ABSTRACTS
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The Management of Health Challenges in our Century (A)
Η Αντιμετώπιση των Προκλήσεων στον Τομέα της Υγείας στον Αιώνα μας (Α)

Co-organization with the Hellenic Cardiovascular Research Society
Συνδιοργάνωση με την Ελληνική Εταιρεία Καρδιοαγγειακής Έρευνας

THE ROLE OF PROFESSORS EMERITI TOWARDS PRESERVING AND ADVANCING THE CAPITAL OF KNOWLEDGE AS A SERVICE TO SOCIETY

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The European Association of Professors Emeriti was created in October 2016 with the realization that an academic teacher could and should continue to offer his services to human community long after his official retirement. Here we should reiterate that the term "Teacher" applies not only to the University but to all aspects of scientific and cultural endeavors. As Henry Adams wrote in 1907: "A teacher affects eternity. He can never tell where his influence stops". The First International Congress is dedicated to the "Capital of Knowledge". Here it should be clarified that *"knowledge"- "Γνώση"* in its true meaning does not merely imply an acquisition of data and facts but an introduction towards finding the true meaning and values of our life, and the correct path leading to this acquisition. Moreover, a Teacher should offer an example of character and life values. As Hippocrates wrote: "I will maintain pure and saintly my Life and my Art".

A Session is devoted to mentoring. Mentoring signifies the transfer of knowledge from the senior to the younger individual through personal contact and preceptorship. Goddess Athena in the Odyssey was the first Mentor.

Additionally, in the Congress all scientific disciplines are represented.

Emeriti and Retired Professors but educators in all Strata of Science and Art should unite their efforts towards dissemination of knowledge in its true sense. To attain this we must reach more colleagues as many countries as possible, not only in Europe and to find ways of projecting our beliefs and ideals. Also, we must collaborate with all Societies and Academies with the same goals, the service to mankind.

Above all, our Association was founded and is functioning as a society of dignified friends with democratic representation and, succession. Because knowledge brings truth, and the truth will set you free.

We, as academic teachers advocate freedom of thought and spirit, but also freedom for all people to partake of the privileges of life, which include education, health, wellbeing and the pursuit of happiness.

ANTIOXIDANT THERAPY

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Reactive oxygen species (ROS) are widely believed to cause or aggravate several human pathologies such as neurodegenerative diseases, cancer, stroke and many other ailments. Their formation in the cell can start from the adsorption of radiating energy, in some cases of heat, but also from the redox reactions occurring within the normal physiological processes, such as respiration, digestion, sport activity. When formed radicals can spontaneously decade, helped by some endogenous enzymes, particularly superoxide dismutase, peroxidase, glutathione oxidase. When endogenous defenses are not sufficient to prevent the damages from radicals a condition called oxidative stress is produced, to contrast which antioxidant therapy must be adopted: antioxidants are so assumed to counteract the harmful effects of ROS and therefore prevent or treat oxidative stress-related diseases. Antioxidants are chemical compounds that giving an electron to free radical species convert them to an harmless configuration, avoiding damaging oxidative chain reactions which can involve lipids, proteins, enzymes, carbohydrates, DNA, cell and nuclear membranes, up to the cell death. Despite of

much enthusiasm in the 1980s and 1990s, many well-known agents such as antioxidant vitamins and also more recently developed compounds such as nitrones have not successfully passed the scrutiny of clinical trials for prevention and treatment of various diseases. This has given rise to a pessimistic view of antioxidant therapy. However, the evidence from human epidemiological studies about the beneficial effects of dietary antioxidants and preclinical in vitro and animal data are compelling. Natural products are today particularly investigated, a lot of them being actually marketed with different claims, An important alternative to medical antioxidant therapy is to exploit the advantages of an antioxidant diet. The most publicized example is perhaps the *French paradox*, based on the apparent compatibility of a high fat diet with a low incidence of coronary atherosclerosis attributed to the regular consumption, by the French, of red wine and/or grape juice. Flavonoids, and other phenolic substances contained in red wine, are assigned with antioxidant properties, which lower the oxidation of low density lipoproteins and consequently, the risk of atherogenic diseases. Other examples are the aging process and its correlation with an increase of free radicals, and the correlation between the initiation and promotion of cancer and tissue injury by free radicals, which has induced the intake of antioxidant products as chemical factors that prevent the onset of the disease. Nutraceutics is a new field of science looking at the advantages that can derive from a reduced use of drugs in favour of opportune diets, based on vegetables, fruits and rainbow feeding criteria.

THE ORIGINS OF REFEEDING SYNDROME: THE PRIORITY OF ANTONIO BENIVIENI (1443-1502)

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RFS, a disease presenting as severe electrolyte disturbance–low serum concentration of sodium, magnesium and phosphate– causing death due to cardiac arrhythmias, cardiac failure and pulmonary edema– was described in 1981 by Roland L. Weinsier and Carlos L. Krumdieck, but it is rooted in a more distant past. We report heretofore unknown deaths caused by RFS described by Antonio Benivieni in *The hidden and remarkable causes of diseases and recovery* (Florence, 1507). Report no. LVII reads: "[In 1496] extensive famine affected nearly the whole Italy, that many died in the public roads and city streets. Many also through bad and injurious foods, were attacked by various disorders. I noticed too that very many of those who had, after long fasting, obtained more abundant food, enjoyed their fuller nourishment for a few days and then died, so harmful and dangerous is satiety preceded by a long period of abstinence. I also saw women who in this way did harm to the children at their breast, and so brought death upon their children and themselves. But very many who were reduced to the invalid state were, by the care and diligence of physicians, restored to their former health in the hospitals".
Data illustrate (i) Death due starvation; (ii) Death due to ingestion of deteriorated/toxic foods; (iii) Death caused by excessive food ingestion after long lasting abstinence from food; (iiii) Death of breast fed children and of their starved mothers; (v) Healing of many diseased persons receiving hospital care. For 474 years Benivieni's description of RFS was ignored.

HISTORICAL PROGRESSES IN THE KNOWLEDGE AND THERAPEUTICAL USE OF STEM CELLS IN HUMANS

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Multipotent stem cells, i.e. cells giving rise to the cells of one or more organs, were the first to be used in therapy and, first of all, the hematopoietic stem cells of the bone marrow which differentiate into blood cells. In 1958, G. Mathé realized the 1st allogeneic bone marrow graft in 6 Yougoslavian physicists who had been sublethaly irradiated. 4 of them survived. This success had a worldwide impact. In 1963, G. Mathé realized the 1st allogeneic bone marrow graft with cells from a compatible donor after total body irradiation in a patient with acute leukemia. The patient survived 20 months. Hematopoietic cells are also present in the cord blood. E. Gluckman realized in 1988, the 1st graft with cord blood cells from an unrelated baby in a patient with a severe Fanconi anemia. 30 years later, the patient was still alive. Epidermal stem cells are also multipotent. Analysis and culture of human epidermal stem cells began in 1975 with J G Rheinwald in Boston and in 1990 cutaneous stem cells were used to reconstitute epidermis leaves in the laboratory and transplant them into large burns or wounds. Later successes with hematopoietic stem cells were obtained in 2009 by N Cartier-Lacave who transplanted autologous bone marrow cells genetically modified in vitro to correct the mutation in a patient with adrenoleukodystrophy (incurable fatal genetic disease). In 2011, L Douay succeeded in generating reticulocytes from the hematopoietic patient's stem cells which when injected in the circulation became mature red cells raising hopes for transfusions in humans. Mesenchymal stem cells are the 2nd type of multipotent stem cells used in therapy. Discovered In 1960, they are few in the bone marrow. They must be purified and cultured before use. They are poorly immunogenic which facilitates allografts in cutaneous burns, diabetic ulcers, myocardial infarction. It is likely that they act by paracrine secretions facilitating the growth of resident cells and not by colonization after cell multiplication. An important step was the use of pluripotent stem

cells which can differentiate into all the cells of the body. They are of 2 types: embryonic stem cells discovered and cultured in 1981 and induced pluripotent stem cells (iPS): discovered and cultured in 2006 by Yamanaka (Nobel Prize in 2012).The last are obtained from adult cells which are reprogrammed into embryonic stem cells and then differentiated into cells from any organ when cultured in an appropriate medium. Embryonic stem cells are obtained from human embryos without parental project cultured after authorization of the Agency of Biomedicine. Their use is limited by ethical questions and it is likely they will never be used at an industrial scale. In contrast, allogeneic iPS can be produced without any limit and their use do not raise any ethical questioning, they are utilized in 3 ways: modeling in vitro of human diseases for screening new drugs, creation of 3-dimensional organoid and regenerative medicine, mainly for genetic diseases after in vitro mutation. Progress in using stem cells in therapy is continuous and, simultaneously, new ethical questions appear, for example: are we allowed to create germinal stem cells to treat sterility or severe genetic diseases, or chimeras (piglet with a human kidney) for transplantation. The answer is no in most countries, but the future is unpredictable.

SLEEP DISORDERS MEDICINE: ADVANCES AND CHALLENGES

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For millennia sleep and its disorders constituted a fascinating enigma. Spiritual, philosophical and artistic approaches were widely implied in understanding sleep related phenomena, most notably dreaming. Moreover, in ancient Greek sanctuaries, such as that of Epidaurus, patients presumably suffering from psychosomatic diseases had to spend a number of nights sleeping there before the religious healer would exert his beneficial role to them.

It was only in the 1930s, following the discovery of the electroencephalogram (EEG), that neuroscientists understood that the brain remains quite active during sleep. Yet, it took another two decades for them in collaboration with psychiatrists to find out that brain activity during sleep goes through certain discrete states which are being registered in the polysomnogram (PSG). Based on the PSG, it was ascertained that dreaming takes place during the stage of rapid eye movements (REM), which occurs periodically every about 90 minutes during the night and occupies about 20% of the total sleep time. In-between REM sleep periods, the stages of light sleep (stages 1 and 2) and those of deep sleep (stages 3 and 4) occur; the latter are characterized by the preponderance of slow brain waves and therefore they have been together called slow wave sleep (SWS).

Starting in the 1970s, neurologists and psychiatrists utilized the PSG combined with their astute clinical observations in studying thoroughly sleep disorders as well as the impact of various physical and psychiatric disorders on sleep architecture. From the 1980s on, otorhinolarygologists, pulmonologists, urologists, pediatricians, endocrinologists, psychologists and pharmacologists joined neurologists and psychiatrists to form a large multidisciplinary group of Sleep Disorders Specialists. With the advent of Sleep Disorders Medicine (SDM) its nosology extended gradually to include the following disorders: Insomnia, Hypersomnia, Narcolepsy, Parasomnias (nightmares, sleep walking / sleep terrors, REM behavior disorder, nocturnal myoclonus), Circadian Rhythm Disorders, Sleep Apnea and other disordered breathing syndromes during sleep. Consequently, clinicians specializing in SDM need to acquire broad skills in adequately dealing with a multifaceted medical field clearly different compared to the one they originated from. The best way to deal with this challenge is to complete a special training in SDM as well as to maintain a steady harmonious interdisciplinary collaboration with physicians and other allied health professionals who can be instrumental in the holistic management of patients suffering from sleep disorders. Another major challenge for SDM specialists is to be able to deal with their patients' psychosocial needs, besides strictly alleviating their sleep related ailments; to meet this important need they should closely collaborate with psychiatrists, psychologists and social workers in effectively approaching their patients' families and employers while advocating on behalf of them.

In parallel with the advances in SDM, basic neurobiological research has made quite a progress. It has been documented that SWS mainly serves for energy restoration processes in the brain and for depotentation of certain key neuronal circuits. There has also been shown that REM relates to review and selective storage of recently acquired memories, while it contributes to potentiation of certain neuronal circuits in order to solidify "useful memory traces". However, major challenges remain unmet: the exact overall function of sleep is not yet fully understood. Much more research is needed in many unexplored areas of the neurobiology of sleep.

A NEW NEED: SELECTING PERSONALIZED TREATMENT FOR FRAIL ELDERLY PATIENTS

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The ageing of the population is one of the most pressing policy issues in the 21st century. Life expectancy at birth has increased during the last decades as a consequence of new living standards, better medical assistance, new medical equipment and increased awareness of health issues. In Europe the life expectancy is now 82.4 years for women and 76.4 for men. This trend is expected to continue. Frailty is one of the most important consequences of population ageing. It induces a decline of many physiological functions and a

progressive organ and system involvements with a greater co-morbidity and a greater mortality.
The state of fragility depends on numerous factors (social, economic, environmental, cultural) that require a strictly personalized assistance. In this context it is important to develop more efficient methods to detect frailty and measure its severity in routine clinical practice. Investigators have developed new valid models of frailty and these models have allowed the association between frailty and different clinical expression requiring appropriate selection of elderly people for selected personalized procedures or drug treatments.

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SURGERY IN ADVANCED AGE

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The global population is growing in numbers and the proportion of elderly people is increasing. By 2050 it is estimated that about 16 per cent of the world's population will be aged over 65 years, twice the current number.
This poses a particular challenge for healthcare systems as a result of the greater needs of the elderly, particularly when independent living is no longer possible
Surgery is an important element of such a plan; surgery cannot be refused neither because of chronological age of the patients nor on economic grounds.
Specific medico-legal issues arise in the area of informed consent, intensity and duration of treatment, and ethics in end-of-life care.
The challenge is to identify optimal care pathways that are cost-effective and that pay particular attention to quality of life. Indeed, when life expectancy decreases with age, it becomes crucial for surgeons to focus on maintaining quality of life as well as increasing life expectancy.
Teamwork is increasingly important in all aspects of surgical care, and the geriatric surgical patient is no exception. Selection, treatment and rehabilitation of elderly patients demand collaboration, particularly when associated with high rates of morbidity.
We hope a "great pact" of collaboration between physicians, citizens, administrators and politicians, to give an answer to the new and increasing healthcare needs in a redefined ethical and normative contest.

THE FUTURE OF VASCULAR SURGERY: THE ROLE OF MEFAVS (MEDITERRANEAN FEDERATION FOR ADVANCING OF VASCULAR SURGERY

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Background: Vascular Surgery is undergoing a fundamental change especially since the introduction of endovascular techniques. The development of new techniques beside the training program of young surgical residents is of crucial importance for the advancement of this surgical specialty. One way to obtain those aims is to create a network amongst University Professors, chiefs of Vascular Departments and consultant surgeons. MeFAVS in this view was founded on 1st October 2018 with the purpose to create a network for the progress of Vascular Surgery and for durable scientific, educational and clinical cooperation amongst Italy, France, Spain, Portugal, Greece, Morocco, Algeria, Tunisia, Egypt, Lebanon, Emirates, Albania, Croatia, Turkey and many others. The current achievements are conference calls and surveys based on topics of vascular pathology, epidemiology, different treatments, procedures, devices, new materials for Vascular Surgery. Diabetic arteriopathy was the first topic discussed in MeFAVS. This is a serious, multi-level pathology, often with severe prognosis, that still affected by significant incidence of major lower limb amputations for ulcers and general impairment.
Methods: We conducted a survey, through an anonymous online questionnaire e-mailed to all members of MeFAVS to investigate current practice on diabetic ischemic foot management.
Results: Response rate was 60%. With regard to procedure type, 46% of respondents use only endovascular techniques and 54% use a combination of open and endovascular. Duplex imaging on all patients is obtained by 83%. With regard to empiric antibiotic at admission, 100% always give it. Moreover, 62% of respondents claim to know their real amputation rate.

SMOKING CONTROL IN EUROPE

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Smoking remains one of the biggest public health issues in the European Union, with a current prevalence rate of 28 %

and the morbidity of smoking costing an estimated 550 billion euros in 2009.
The main pillar for addressing this problem is the World Health Organization's Framework Convention on Tobacco Control (WHO FCTC), the first ever global public health treaty covering 91% of the world population.
In the framework of the FCTC, the EU has formed the Tobacco Products Directive (TPD) I and II which aim to improve the functioning of the internal market for tobacco and related products. The EU also funds the European Network for Smoking and Tobacco Prevention (ENSP), an international non-profit organization with the mission to develop coordinated actions among organizations in tobacco control.
Greece has been a major contributor to these efforts through participation and leadership in several projects and programs. The most important currently, is the EU Joint Action on Tobacco Control (JATC) project coordinated by Professor Panagiotis Behrakis which aims to promote the implementation of the EU TPD. Other EU projects include the TackSHS, TOB.g, DIRECT, PRECISE, EUREST+, EQUIPT projects, developing the European Smoking Cessation Guidelines and Quality Standards and a national Health Education Program for Greek students "Learning the truth, say no to smoking".

BIG DATA AS A SOLUTION TO NEW DIAGNOSTIC AND THERAPEUTIC CHALLENGES

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The digitisation of medical information, and its mass storage in digital centres of enormous capacity, are undoubtedly a rapidly evolving reality.
Big data means data that contain greater variety, arriving in increasing volumes and with even higher velocity. These are known as the three Vs: volume, velocity and variety.
The challenges of big data include data capture, data storage, data analysis, search, sharing, transfer, visualisation, updating, and information privacy.
Given our current capabilities for the classification and analysis of a patient's medical information over time, or of a large number of patients at the same time, the use of predictive analytics has understandably opened vast new possibilities for precision medicine.
Using the new technological capabilities, it is possible to analyse and to compare genetic codes in order to draw specific conclusions, or to codify the symptoms, signs and electronic records of millions of individuals *en masse*, allowing us to derive conclusions and knowledge in a way that would have been unfeasible until recently.
It is clear that big data analysis, especially when boosted by the use of artificial intelligence, can lead us beyond today's evidence-based medicine. It is precisely this medicine, characterised by highly personalised observation and disease management interventions, that will be based on big data analysis and advanced statistics.
This now raises the question: Should doctors of the future also have a mathematics degree?

Culture and the Environment Πολιτισμός και Περιβάλλον

GLOBAL WORLD INSTABILITY

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European history is a record of historical and social turning-points which have determined the continent's identity. A different sort of cleavage can be found in the 20th century, but in the present phase of globalization the main questions are relationships between stability and instability, and linkages between the demographic, ecological, economic, social, political, cultural, and personal. The world was, is, and will always be in a state of continual variability and movement. Nowadays though the process of change has become more rapid, and furthermore is accelerating throughout the world. This means that the crisis-ridden past, and the present's unstable ecological, social, political, economic and moral situation will be followed by an uncertain and conflicted future bringing instability and causing greater uncertainty (like mass migration, or international terrorism). In today's globalized world absolute values and relationships are gradually disappearing. Relativity is penetrating everything, the permanent forms of life are perishing, state borders are becoming porous, and well-being in market economies is coming into vogue. The world is affected by ecological, social and economic processes that reinforce political instability, with the result that the very future of mankind is now uncertain. The result is that we are fearful of relatively rapid deterioration of existing international relationships threatening to become planet-wide conflicts.

SCIENCE, RESEARCH, INVENTION, DISCOVERY HOW TO MANAGE

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Science has a very large and ambitious meaning which is «knowledge», a knowledge which demonstrates causes of what can be encountered in the universe… Modern sciences comprise natural, sociological and formal sciences.
Research covers activities intended to develop the scientific knowledge with two main orientations fundamental research

and applied research. Research activities are carried out in private or national laboratories.
Invention and discovery should not be confused. Discovery is related to what already exists, when invention is related to what does not pre-exist. Christopher Colombus discovered America, Denis Papin invented steam engine.
Discoveries can have several origins: methodical work, sudden idea, chance, error. Methodical work, which is often carried out by young researchers, is not always directly fruitful but can lead to the discovery of something unexpected. Chance or error lead to discovery only if the scientist/researcher tries to understand and explain what happens. Sudden idea (or flash hypothesis) requests thorough verification.
Successful research requires curiosity: curiosity to understand unexpected results, curiosity to further use these results in domains slightly different from the original ones, curiosity to be able to transform and use discoveries done in other domains.
Of course, the human aspect must not be neglected: aptitude to exchange between the «mentor» and the «students», between different mentors, aptitude to communicate through scientific papers or lectures. In that sense, research is school of life.

FIRE IN A CHANGING WORLD

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Fire is an integral and dramatic part of today's terrestrial world (Pyne, 1995). Many fires are truly natural wildfires, many are started by Man. Wildfire is as old as the terrestrial vegetation (approximately 350-400 million years) and has contributed to shape global biome distribution and to maintain the structure and function of fire-prone communities. During the past 20,000 years humans have been a major source of ignition, having used fire for various purposes. From a human perspective fire has been typically considered as "bad" while its fundamental role as an important ecological factor and an evolutionary agent in many ecosystems has been neglected. Boreal forests, shrub lands, grasslands, savannas and eucalypt woodlands are flammable ecosystems with peculiar fire regimes and fire adaptive plant traits. In such ecosystems fire suppression results in the loss of biodiversity and major shifts in structure and function; moreover, fire suppression leads to fuel accumulation and higher fire severity and impact, that threaten post-fire ecosystem recovery. The negative human and economic losses caused by fires and the threat to human health from smoke, and post-fire flooding and its potential to contaminate water supplies, gain a wide public attention, and therefore recognition. In contrast fire as a natural ecological factor is not equally well recognized. There needs to be the awareness that fire is both a destructive yet important ecological factor to feed into the idea of sustainable fire systems.
We are uniquely fire creatures on a uniquely fire planet - S.J. Pyne.

THE THIRD CULTURE AND THE ROLE OF EAPE IN ACADEMIA

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The culture actually is divided in two intellectual aspects: the arts and humanities on one side and the natural sciences on the other. The Academia followed this division and contributing to fractionalize the culture and teaching it according this division that in the real world must not exist today. The experience showed that scientific and humanistic cultures must be strictly connected if we want to imagine a cultural complete world. On this point of view Academia formed or scientific or humanistic persons who not discuss between themselves about the real world. The natural science researchers not consider the humanistic world and its problems and at same time the humanistic researchers not consider the natural world and this is a big gap for our and future societies. Third culture expresses a constructive dialogue among the various disciplines, it requires the wish to strengthen exchanges on the more searcher's advances and on the application of the same in the real world, and dialogue among scientific planet and not scientific, between science and humanism. We must teach to our young people that we are living a phase of extraordinary cultures and that we must speak among them to overcome the dualism science-humanism. Culture is one and dualism is between doing and not doing culture. The role of EAPE could be important to spread and to suggest the introduction of the vision of third culture in the universities' study programs because EAPE include members from scientific and humanistic world. We suggest the strategy to do this.

SUPPORTING THE ENVIRONMENT, CULTURE AND SUSTAINABLE DEVELOPMENT WITHIN AND BEYOND THE UNIVERSITY

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A critical issue for the future of Universities, is their interaction with Society at all levels. In addition to high caliber education and research and actual "opening" of the horizons of students to these "new" fields, academic work should lead to Sustainable Development (SD) covering many aspects of it: environmental, socioeconomic and cultural, while contributing to governance from suggesting policies, to monitoring and warning. This ambitions concept of high-quality science in the service of society keeping, however, clear distance from

party politics, has formed the vision/driving force of the work of the laboratory of Environmental Chemistry of the UoA.
Through collective work of its staff or the role played by its Director it was instrumental for the study and depollution of the heavily industrialized Gulf of Elefsis, and many other coastal and protected areas. The latter also by chairing the HNC of MAB/UNESCO. The contribution to protection and restoration of natural and cultural heritage (including monuments) of the country was obtained though cooperation and chairing for 19 years of the Hellenic Society of Environment and Culture.
The contribution to formulation of EU, UN Environment/MAP and UNESCO policies was done directly and through chairing the European Environment Bureau and representing, for 25 years, the European Parliament in the Board of the European Environment Agency.
The laboratory co-organised the historic conference of UNESCO (Thessaloniki, 1997), introducing, at global level Education for Sustainable Development (ESD) and has co-drafted the UNECE and Mediterranean Strategies on ESD, implementing also ESD projects at local (within schools), national, regional and global level.
The promotion of public awareness and active involvement of citizens and their organizations in protecting the environment, was obtained through the establishment of the Mediterranean Information Office for Environment, Culture and Sustainable Development (MIO-ECSDE), of MEdIES (Network of 6000 ESD educators), of COMPSUD (for Parliamentarians), of COMJESD (for Journalists), of the Network of Mediterranean Universities for SD and by bringing all the above, together with GWP-Med, in the Network of the UNESCO Chair, established in the UoA.
In cooperation with GWP-Med, the Integrated Water Resources Management (IWRM) and Integrated Coastal Zone Management (ICZM), are actively promoted, while more than 50 pilot projects, concerning rainwater harvesting and gray water reuse, were carried out and transboundary issues (Drin, Orontes) are successfully dealt with.
Contributions in Hydrodiplomacy extended in chairing the International Panel of Experts of the World Bank for the Red Sea-Dead Sea Conveyor while through Leading the Horizon 2020 CB/MEP, more than 150 environmental trainings and other activities were carried out in the non-EU Mediterranean countries.

Special Lecture
Ειδική Διάλεξη

THE COLOUR OF WEATHER AND CLIMATE

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Red-to-green ratios as depicted in paintings by great masters in the past and with digital cameras at present can provide important environmental information towards estimating aerosol optical depths at sunsets. The method has been tested at a number of large known volcanoes in the past and provides an estimate that has been tested with a large number of cases. Following large volcanic eruptions, statistically significant excursions of red-to-green ratios have been observed and radiative transfer mode calculations were used to compile time series of aerosol optical depths at 550nm over northern middle latitudes. The Tambora eruption is among the most prominent AOD phenomena of the past few centuries as far as the red-to-green ratios in historic paintings are concerned. Comparisons with different proxy methods with the proposed chromatic method will be presented for the case of the Tambora eruption in an attempt to further quantify and rank the phenomenon and its environmental consequences.

Friday, 31 May 2019

The Capital of Age
Το Κεφάλαιο της Ηλικίας

SYSTEMS METABOLOMICS FOR HEALTHY AGING

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One of the issues fostered by European Union, in its science policy, is to promote healthy aging, with the aim to reduce public healthcare expenses and to increase the apport of aging people to the socio-economical productivity and wellness. Two orders of problems need to be solved: reduce the impact of age-related diseases (cancer, neurodegeneration, etc.) and slow down the aging process *per se*.
Recent studies, done in my laboratory, have recognized a significant role of metabolism for both these issues. The increased sophystication of analytical technologies (GC/LC MS) (Gaglio et al, submitted) and the construction of constraint-based mathematical models, allow to extract and validate the rules governing metabolic changes in cancer (Damiani et al, PLoS Comput. Biol., 2017). Thereby offering a first example on how to investigate and control metabolic changes in various physiological and pathological conditions. This findings are coherent with a large literature production showing a central role of metabolism in aging.
This approach, if sustained on a large scale, may very well bring, in a relatively short period of time, to achieve the goal of diffuse healthy aging and, at the same time, to increase economic growth and create new jobs, given the many manufacturing and service activities that it may promote.

AGING AND ITS CAUSES

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Aging is the result of a series of biological processes that cause the decline of human biological functions with the passing of time eventually leading to death.
The main factors that affect aging are a) genetic b) environmental and c) diet. People start aging before birth, if we consider that the number of neurons continuously decreases after birth.
Approximately 300 different theories have been formulated to explain the phenomenon of aging. In every theory there are approximately several common reasons (mechanisms) of aging. In order to better study the phenomenon, we could classify all these mechanisms into 2 theories.
The *mechanistic* and the *evolutionary theory*. According to the first theory, molecular and cellular mechanisms are involved such as DNA lesions, free radicals and mitochondrial damage. According to the second theory, we reach the conclusion that aging is a genetic disease that is due to multiple mutations with significant impact in older people.
The important question is: What we expect as we get older and what to do about it?

WHEN SCIENCE IS EXCEEDINGLY SLOW: THE CONTRIBUTION OF SENIOR INVESTIGATORS TO THE SOLUTION OF "COLD CASES"

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Advancement of knowledge is a uneven process, not only from a chronological standpoint (due to the irregular and serendipitous progress of science and civilization), but also because it reflects variable perceptions of social needs, causing deep and sometimes abrupt changes of what people are expecting from science and technology, Consequently it happens that even within individual disciplines the investigation of specific topics proceeds with different speed, being either propelled by bursts of general interest or suddenly put aside, according to the mood of the scientific community and, even more, of the public opinion and of the funding agencies. Senior scientists more than their younger colleagues, have the opportunity to witness such a phenomenon and to keep the record of neglected old questions still waiting for an answer. My scientific career covers more than half a century and I had the opportunity to witness and in part contribute to the solution of a number of intriguing "cold cases". Especially telling is the belated identification of the enzyme(s) responsible for phosphate incorporation into milk casein and egg yolk phosvitin. These were the first phosphoproteins ever described, in 1883[1] and 1900,[2] respectively, and they were instrumental to the discovery of "protein kinases"[3] a huge family of enzymes (>500 in human) committed to the control of all biological functions and whose dysregulation underlies many global diseases, with special reference to neoplasia. Paradoxically however the enzyme(s) responsible for casein and phisvitin phosphorylation escaped detection for many decades due to the assumption that these secreted proteins display only marginal biological interest. Consequently, this enzyme was discovered only recently[4-7] and shown to be identical to Fam20C, an atypical protein kinase whose mutants are causative of severe bio-mineralization disorders, disclosing novel unanticipated perspectives in different fields of life science[7,8] with enormous physio-pathologic implications.
In a similar vein, several decades ago it was reported that in vitro protein phosphatases display a striking preference for phospho-threonine despite that their in vivo substrates generally were phospho-serines.[9-11] Such an observation was dismissed as a misleading artefact until preferential dephosphorylation of phospho-threonine has been recently shown to be essential for mitosis.[12,13]
A general lesson that can be learnt from these examples is that "cold cases" often conceal "hot issues" and that reproducible artefacts almost invariably reflect the occurrence of physiologically relevant phenomena whose disclosure may be time consuming and exceedingly troublesome but appealing to senior scientists with a more detached outlook.

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TEACHING COMPLEXITY: THE CASE OF MEDICINE

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Science progresses on specialists. Although indispensable they are despised since are seen and daffodils who defend they originality by secluding themselves in smaller and smaller niches. Murray Gell-Mann – the founder of *plectica* (in Greek intertwined, twisted) and of the Santa Fe Institute in New Mexico asked however to integrate "specialized studies with an approximate overall look". We can now take advantage of the *Charter of transdisciplinarity* which represents a space for synthesis "across, between and beyond" disciplines as written in 1994 by Edgar Morin (*Les sept saviors nécessaires â l'éducation du future*, 1999), Basarab Nicolescu (*Manifesto of transdiciplinarity, 2002*) and Lima de Freitas which calls to create bridges between disciplines. Morin wrote "*sparsa colligo*" (*La voie*, 2011) that is I assemble together what is dispersed. In fact at the time of globalization specialization induces progress in knowledge but s trade-off it separates pieces knowledges which rather should be kept together. Thus we need a transdisciplinarity as well as complexity which unifies knowledges mot just juxtaposes them. Lester Thurow (*The Zero-Sum Society*) says that we are obsessed to obtain results in short times which however prevents to advance great projects. So for Mario Ceruti (*Il tempo della complessità*, Cortina, Milan 2018) Thus we need strategies useful for short and long times, that is promoting a diffuse excellency. It is a sign of our times the fact that multi-disciplinarity has now a role in the academy and is seen as the core of the cultural enterprise. Of course we have to be ready to catch the unforeseen as hypothesized by the Poet Eugenio Montale –Nobel Prize winne– in *Prima del viaggio* (Before the travel). Complexity is method which can help us to turn basic science into cures and helps in achieving the astonishment needed to know. *"Only stupor knows"* wrote Gregory of Nissa father of the Oriental Church. At medical faculties the goal is to nurture people with 3 talents: good physicians, good investigators, good teachers. However only a few possess all of them, some have two of them and the majority one. Perhaps teaching disciplines individually is the main limitation to this goal. We have to imagine a different approach and use it at variance with the past, teaching complexity may generated the breakthrough.

HOW NOT TO BUILD A HUMAN KIDNEY: SPECULATIVE ALTERNATIVES

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Current attempts to create a biological kidney using stem- and progenitor-kidney cells, are based on the principle of mimicking the structure and function of the human kidney. It is pointed out the evolution has conferred upon humans a kidney which is highly energy-inefficient, in which the major work of the organ is to reclaim a vast quantity of ultrafiltrate with its constituent molecules and ions. For purposes of creating a *de novo* biological kidney, this model is viewed as being misguided. An alternative approach is proposed, which separates ultrafiltration from tubular secretion and proposes that these two activities can be handled by two separate organs, each delivering only those the amounts which need to be eliminated from the body. The need for a reabsorptive component is eliminated. Speculative proposals are provided as to how such organs could be bioengineered.

Scientific Achievements through the Ages Επιστημονικά Επιτεύγματα διαμέσου των Αιώνων

PREHISTORIC GREECE- ACHIEVEMENTS IN SCIENCE AND TECHNOLOGY IN THE GREEK PREHISTORIC ERA

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Ancient Greek Literature provides evidence for achievements in Science and Technology in the Greek Prehistoric Era. Homer, Hesiod, Aeschylus refer to events and accomplishments of marvelous inventions which remind fulfillments of contemporary science and technology.

Homer describes a plethora in his Epics Iliad and Odyssey. Most of them were constructed by Hephaestus, the Divine Lame Smith god of metallurgy, fire, crafts. In Iliad, Hephaestus fabricates many famous items called Hephaestoteucta, Olympian Palaces, bronze robot Talus, automata i.e. golden maidens, tripods on wheels, Achilles' and Ajax' armor, Perseus' sickle, Dionysus' crater, Harmonia's necklace etc. He captures his mother Hera in invisible chains on a throne he had built, traps his wife Aphrodite with Ares in an invisible

net, is credited with the crafting of Pandora, the first woman at the command of Zeus
In Odyssey, presents the automatic navigation of Phaeacian ships. Argo, Argonauts' ship, contained in her prow a magical piece of timber from Dodona's sacred forest, which could give prophesies. Nowadays, Argo is a new system of Oceanography. Hesiod notifies that the Cyclopes Brontes, Steropes and Arges fashioned the thunderbolt for Zeus. Regarding telecommunication, in Aeschylus' Tragedy "Agamemnon" the King makes signals using beacons to announce the fall of the City from Troy to his wife Clytemnestra in Mycenae. Very impressive is, also, the Antikythra computer. These amazing attainments, comprise a reality challenging to be interpreted, very astonishing to the today scientific community.

THE OVERSEAS TRAVEL OF THE PREHISTORIC GREEKS (CRONUS AND HERCULES) BASED ON THE DESCRIPTION OF PLUTARCH

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Plutarch, one of the prolific ancient Greek writers, is known in Greek and international audience for his two series: "Parallel Lives" and "Moralia". At the Moralia series, in the form of speeches and essays, he develops various issues of moral, philosophy, history, religion and science.
In two of his works, and more specifically "*On the Face that appears in the Orb of the Moon*" and "On *the Obsolescence of Oracles*", besides the many interesting issues, he includes numerous geographical information that allow the modern geographer to realize the following: i) The geographical knowledge that prehistoric Greeks had, since the time even before they were named as Greeks, ii) That their knowledge was extending as far as the North Atlantic, known as the "Cronian Sea", iii) That the descriptions of their observations regarding the sediment transport through glaciers are confirmed through modern oceanographic research at these areas, iv) o follow step by step the course of Hercules and his men towards the exile place of Cronus.
Taking into account (i) the geographic references of the Plutarchian text such as Britain, the Ogygia island, the Cronian Sea etc., (ii) the duration of the travel between Britain and Ogygia, (iii) the reference of Plutarch that the exile place of Cronus is located on an island, where the sun pass out of sight only one hour per day, (iv) the results of the modern oceanographic research of fluvial glacial sediment transport and deposition and (v) using a simple geographic school atlas, we try to locate: a) The Cronus exile placem, b) The Great Continent west of Ogygia, c) The gulf which is not smaller than the Maeotis lake, d) The coast of the mainland where Greeks dwell e) Etc. Based on the results of the aforementioned geographic analysis and the references of the writers of the historic times for the same areas, among them Homer, Hesiod, the Orphics, Ctesias of Cnidus, Herodotus, Pytheus, Strabo, Diodorus Siculus, Apollodorous and others, it has been realized that: i) The knowledge of the prehistoric Greeks was extending as far as the North and North-Western Atlantic, ii) That the geographic knowledge of the Ancient Greeks of the historic period was limited compared to those of the Minoan and Mycenaean period.

ARCHAEOASTRONOMY

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Since last century Science and Technology contribute significantly to a better understanding of the ancient world. Among other disciplines and techniques Astronomy also offers its aid for this purpose.
For example, the observation of various astronomical phenomena and their recording in texts is significant for their date. Consequently, the search for such astronomical information in texts may result in exact dating of an event.
Moreover, measurements of the orientation of the main (longitudinal) axis of temples, churches, tombs and other buildings give significant information regarding the deities (or saints) to whom they are dedicated, as well as the dates of festivals linked to their worship.
The best example of the combined contribution of Science (Astronomy, Mathematics, Computing Science, Chemistry and other) and Advanced Technology to the understanding of Antiquity is the investigation of the Antikythera Mechanism that continues even now.

ARISTOTLE AND SEAWATER DESALINATION-A NEW EXPLANATION OF AN EXPERIMENT DESCRIBED IN METEOROLOGICA AND HISTORIA ANIMALIUM

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Aristotle (384 - 322 BC) deals- from a scientific point of view- with the water and has a clear perception of the desalination of seawater reported in his *meteorologica* book B: seawater when it turns into vapor becomes sweet and the salt water does not form salt water again when it condenses i.e. refers to the desalination of seawater by evaporation. Furthermore, describes the following experiment: …If you create a vessel with wax coating and place it into the sea after binding the spout of the vessel so that the seawater don't spill inside, then the incoming water through the wax walls becomes potable water. The experiment is mentioned again in *Historia animalium* with

some differences such as that the vessel is empty and that a certain quantity of potable water is produced within one day. It is noteworthy that the experiment appears to have great impact during the Byzantine period. It is mentioned near to verbatim by Gennadius Scholarios (1405-1473 BC). According to scholars which commented the text the experiment is not verified. On the contrary we assume, that this experiment is a method of sea water desalination by reverse osmosis with these arguments: a) the vessel is made of porous clay which in conjunction with the wax creates a semi-permeable membrane b) the required pressure is the hydrostatic which increases as a function of sea depth. Nowadays reverse osmosis is a commercially available technology for desalination of sea water. In order to verify the described experiment a project supported by SYCHEM SA is in progress.

FROM MYTHS, MAGIC, MYSTICISM, METAPHYSICS TO SCIENCE - THE DEVELOPMENT OF CHEMISTRY FROM THE ANCIENT TIMES TO THE BEGINNING OF THE 20TH CENTURY

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In this presentation, the history of chemistry and its significant steps of development will be highlighted. In chronological time spans, covering the ancient world, the Hellenistic and Roman Empire ages, the middle Ages to the beginning of the 20th century, the progress of chemistry will be presented.
Alchemy's heritage is one of the most valuable and complex cultural and humanist heritages of our today's science. Though, its absolute significance is covered by a thick veil of esotericism, symbolism, allegoric analogs, and hermetism, making very difficult to clearly understand its essential meaning and its contribution in the development of Chemistry. Through a path of mysticism, metaphysics, prejudices and strange religious beliefs, chemistry managed to emerge finally, step by step, as a self-centered scientific discipline somewhere in the 17th century, thanks to the work of a few truly enlightened people.
Already from the epoch of Homer there are references, in his poems Odyssey and Iliad, to processes nowadays closely associated with chemistry. The roots of chemistry are deep, starting with pre-Socratic philosophers Heraclitus and Embedocles, who established the concept of existence of the principall elements, fire, air, water, and earth, named roots («ρίζες»). Leucippus and Demokritus, proposed the first theories for the nature of matter and atomism. Aristotle added the fifth element of aether, whereas Plato gave shapes to atoms through his platonic solids and used for the first time the word "στοιχείον" (stoicheion = element) to describe them. During the Hellenistic era and up to the 4th century AD, a great number of philosophers and experimentalists studied particular materials and processes. The Arab conquerors of Egypt (639–642 AD) made use of this ancient knowledge, and contributed greatly to the newborn "science", the Alchemy. During the Byzantine Empire the famous **"**υγρόν πύρ**"** (hygron pyr = liquid fire, Greek fire) was known as the unbeatable incendiary weapon of Byzantines. The Alchemists followed the Aristotelian ideas but considered also the three primary elements of matter (tria prima): mercury, sulphur and salt.
In the Middle Ages, the alchemists searched relentlessly for the philosopher's stone, but also a major component of the elixir of life (Arabical + iksir = the stone, "stone of knowledge", Greek "ξηρίον»). During the Renaissance time, Paracelsus (1493-1541), was the precursor of medical chemistry. The phlogiston theory was developed by J.J. Becher (1635–1682) late in the 17th century and was extended and popularized by G.E. Stahl (1659–1734). This theory dominated for many decades until it collapsed mainly by Antoine-Laurent Lavoisier. The excellent contributions of the scientist who worked for the development of chemistry and analytical chemistry, during the 19th to the first decades of the 20th centuries will be also highlighted.

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The Activities of Academies and Emeriti Associations
Οι Δραστηριότητες Ακαδημιών και Εταιρειών Ομοτίμων

THE FRENCH ACADEMY OF SCIENCE, A 350-YEAR-OLD INSTITUTION AIMED TO PROMOTE SCIENCE

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The aim of the presentation will be to provide an overview of the French Academy of Sciences and of its roles. The French Academy of Sciences was founded in 1866 by the king Louis the XIV to promote the development of sciences and to provide advices and recommendations to the government. At the present time, the Academy includes 270 academicians and 120 foreign associates divided into two sections: basic science (mathematics, physics, chemistry, information science, sciences of the universe) and life science (molecular and cel-

lular biology, genomics, human biology and medical sciences). The five main missions of the French Academy of Sciences are to: 1) encourage and sustain scientific life by organizing public conferences, debates and colloquia on an approximately bi-monthly basis. The Academy awards every year around 60 prizes, 2) promote scientific education from primary school to higher education. The Academy strongly supports the Foundation «La main à la pâte» whose objective is to improve the quality of teaching sciences at school, 3) transmit knowledge by publishing the « Comptes Rendus de l' Académie des Sciences » in seven different disciplinary areas. Most public conferences and colloquia can be downloaded from the Academy web site (http://www.academie-sciences.fr/fr/). 4/ promote international exchanges and collaborations with a special attention to emerging countries. The Academy actively participates to several European and international academic networks.

5/provide expertise, advices, and reports to the government, national agencies and the scientific community. Working committees of the Academy are devoted to sustainable development, energy resources, spatial research, biosecurity, science and metrology, society and ethics, philosophy and history of sciences.

ENERGY AND MODERN CIVILIZATION: THE EMERGING GLOBAL LANDSCAPE AND ITS CHALLENGES – THE ACTIVITIES OF THE ACADEMY OF ATHENS

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Energy is and will remain the most critical parameter in every country's development and in world-wide efforts to alleviate poverty and protect the environment and curtail climate change. The total world energy consumption continues growing and the world-energy mix continues changing. The use of oil and coal is decreasing and that of natural gas is increasing. Although there is a clear shift in the energy mix toward Renewable Energy Sources, the use of oil, coal and natural gas will continue to dominate energy consumption for decades and therewith lies the problem and the challenge: in the coming decades, fossil fuels will continue to prevail and will continue to exacerbate climate change. Negative Emission Technologies aiming at removal of CO_2 (many Gt of CO_2 per year) from the atmosphere may not be possible, and urgent mitigation measures will be needed at the source, foremost in the combustion industry. Burning fossil fuels to generate electricity, will continue because the demand of modern civilization for electricity will continue to grow; by 2050, it may reach 30 TW, that is, twice its present level. Thus, the need of renewable electricity and decarbonization.

In 2005, The Academy of Athens established its Energy Committee to provide sound information to the Greek citizens and independent and scientifically documented advice to the State on energy sources, uses, needs, conservation, planning, perspective and energy policy. The Committee accomplishes its purpose by in-depth studies by experts, conferences, workshops, lectures, bulletins and widely distributed and free-of-charge books. The energy subjects the Committee has dealt with to date are: Energy Conservation; Energy and the Environment; Nuclear Energy and the Energy Needs of Greece; Materials for Energy Applications; Electricity Generation in Greece; Concentrating Solar Power; Greek Hydrocarbons; Renewable Energy Sources; Waste Management and Use of Waste as an Energy Source; Energy and Development Planning in Greece; Energy and Transport in Greece; Energy Outlook in Greece to 2050; Energy Research in Greece.

THE ACTIVITIES OF THE ASSOCIATION OF PROFESSORS EMERITI OF THE UNIVERSITY OF ATHENS. OUR 40 YEAR ANNIVERSARY

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The Association of Professors Emeriti of the University of Athens (actually named as SOMA-Body or Corpus-SOKPA) was founded in January 1979.

Its aims were defined as follows:

The study of matters pertaining to University Education especially aspiring to progress and reform.

The expression of views to the Government and to University Principals and the provision of every type of aid towards the implementation of the goals of University Education.

The contribution and the motivation of the members of the Association as regards matters of University Education and function. These were subsequently complemented by the following items: The participation to scientific and technological research of the University of Athens. The communal, moral, scientific and health support of Emeriti and retired Professors of the University of Athens.

Since then the Association which counts 347 active members has engaged in many activities pertinent to its founding aims. Thus it has organized yearly lectures delivered by its members but also invited Professors from other Universities. In the Academic year 2018-19, 15 such lectures were delivered. Since 2014 the "Body" has organized 4 courses addressed to the general public, with the title "The University of the Citizens". The disciplines represented so far have been Medicine, Law, Literature, Religion/ Theology. History will be represented in 2019.

From these courses, 3 books on Law, Literature and Theology have been produced. Also a book on Emperor Hadrian: Athens- Rome 117-2017 has been published in 2018.

The "Body" has presented the problems and needs of the Emeriti and Retired Professors to the Ministry of Education

on numerous occasions with satisfactory results. Since 2017 SOKPA has organized the welcoming Reception of Professors finishing their Academic career in the University of Athens. Also, it is hoping to establish a welfare action under the auspices and with the collaboration of the Archbishop of Athens and all Greece. SOKPA has been instrumental in organizing the Founding Congress of the European Association of Professors Emeriti in September/October 2016 and is offering organizational assistance to the 1st International Congress. Also, it has collaborated with the Association of Professors Emeriti of Northern Greece to form the Federation of the Association of Professors Emeriti of Greece, in which the Association of Professors Emeriti of the National Technical University of Athens and the Athens University of Economics and Business are participating.

FRENCH ACADEMY OF MEDICAL SCIENCES (ITS INFLUENCE IS BASED ON THE REPUTATION AND EXPERIENCE OF ITS MEMBERS)

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The French language has two meanings to the word emeritus. This is a personality who has completed their professional activity but enjoys the honours related to their work and experience. It is also the adjective attributed to a person who has a particular experience in a specific field. It appears to me that the latter is the best to define the titular members of the French Academy of Medical Sciences who are distinguished academics. This is the reason why I think that the Academy has been given this role in Health field. The voting age of a titular member is around 65, which is close to the age of university professors' retirement to become emeritus professors.

In the countries where Academies of Medical Sciences exist, we can notice two main types of structural patterns: some of them are very selective, retaining only a limited number of high reputation members, while others bring together a large number of mainly professionally active members in order to cover a wide spectrum of skills. The organisation of the French Academy of Medical Sciences is intermediate: in addition to the 135 fellow-members, there is a set of corresponding members, mainly professors of universities and hospital practitioners in full activity. They allow think tanks and workshops to be in full relationship with the current affairs.

Fellow-members and corresponding-members are divided into four divisions such as: 1) Medical specialties, 2) Surgical specialties, 3) Biological and pharmaceutical sciences and 4) Public health, This fourth division has in its ranks a representation of veterinarians.

The Academy is responsible for advising public authorities on Public Health issues, promoting the development of knowledge in Health field. The institution is also participating in the international influence of French Medical sciences. In addition, following the evolution of Medical sciences, the Academy strives to promote exchanges and information between, on one hand, Science and the innovations linked to it, and on another hand, the Public which is often traversed by wrong, unfavourable, even dangerous streams of opinions.

The mission of the Academy is independent.

Questions submitted to the Academy and decisions are published in reports and press releases. These files are prepared by specialised committees.

Through some examples of recently published press releases and reports, the nature of the work carried out in recent months will be highlighted, with emphasis on the recommendations that have been made.

In conclusion, emeritus university professors and emeritus health professionals are at the heart of the activity of the Academy, they play a decisive role in the influence and authority of the Academy of Medical sciences in Health field.

THE ACTIVITIES OF THE ASSOCIATION OF PROFESSORS EMERITI IN NORTHERN GREECE AND THE IMPORTANCE OF JOINING OUR ACTIVITIES WITH OUR COLLEAGUES IN EUROPE FOR SPREADING SCIENTIFIC KNOWLEDGE

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The Association of Professors Emeriti of Northern Greece was founded at the end of last Century. Although it is a young Association, it plays an active role to promote matters of Academic, Scientific and Social Importance.

Some indicative activities include the organization of a National Conference to examine the admittance policies to the Greek Universities. The conference examined relative procedures from 15 European countries and invited the Greek Political parties to express their views, to obtain a better understanding of the Entrance policies.

Joining with the Association of Professors Emeriti of the University of Athens we proposed the nomination of the Greek Aegean Islands for the 2016 Nobel Peace Prize in recognition to their valiant efforts and heroism to help rescue thousands of refugees from Middle East Countries.

Three years ago, we started a program "Knowledge for the Citizens", where members of the University Community present as Lectures or Round Table Discussions, valuable scientific subjects for open dialogue with the audience. We strongly believe that the recent founding of the European Association of Emeriti Professors will be a good guide for further cooperation which will strongly benefit our European Societies and Scientists.

THE NEED TO DEFINE THE ROLE OF EMERITI PROFESSORS AS A EUROPEAN STANDARD

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The title "Emeritus/a Professor" (E.P.) is given normally by the Academic Senate of a European University to a person of outstanding merit who had full professorial status before he/she retired, and has offered substantially to the Institution and society. The goal of the title, besides recognition, is to give the opportunity to the retired professor to continue his/her research and teaching activity within the university and to offer to the academic community by finding funding for his/her work[Wikipedia]. However, the role of E.P. varies excessively among the universities in Europe, even in the same country. In this presentation, a European Standard for the role of E.P. is suggested, which could be adopted and implemented by the national authorities and universities. Some indicative principles are:

- E.P. may undertake lecturing on postgraduate studies. After decision of the relative Department, they could continue to lecture in undergraduate studies.
- E.P. may undertake supervising of Master, PhD and Post-doc theses, including their participation in the examination procedures.
- E.P. may continue conducting their research work, including coordination and participation in subsidised research projects, following any regulation anticipated for staffed professors.
- Electoral bodies for new members of the faculty may consult E.P. for their opinion about the candidates.
- A representative of E.P. is invited to attend, without vote, the meetings of the Academic Senate and the Research Committee.
- E.P. should be allowed to use the installations and facilities of the Institution, retain office space and continue to be updated about the university activities.
- Collaboration of European E.P. in conducting research projects, organization of conferences of interdisciplinary and intra-cultural interests and offering courses to the general public may be promoted by the Universities.

In general, Emeriti Professors have to offer their aid to their still active colleagues and to society on a voluntary and public benefit pro bono basis, due to their extended experience.

THE HISTORY AND ACTIVITIES OF THE EUROPEAN ACADEMY OF SCIENCES AND ARTS

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The European Academy of Sciences and Arts - founded in 1990 - is an international, non-governmental, and non-profit organization committed to scientific and societal progress. Its members - among them 32 Nobel laureates - are scientists, artists and business experts, who aim to promote innovative research, European scholarship as well as interdisciplinary and transnational collaboration.

Since the mid-80s the heart surgeon Felix Unger from Salzburg and the former archbishop of Vienna, Franz Cardinal König †, held regular meetings with renowned scientists from Vienna, Munich, Innsbruck and Salzburg. Based on these meetings, Unger and König came up with the idea of institutionalizing the scientific dialogues. They realized the need for a new academy, which should take into account mankind's changing conceptualization of the world while also considering the transformation of the meaning of science: Topics relevant to society should be dealt with interdisciplinarily and transnationally.

In 1988, Cardinal König introduced Felix Unger to the political philosopher Nikolaus Lobkowicz, who had sought for possibilities to reduce the decline in values which he saw in Europe. Lobkowicz realized that this challenge called for representatives of all scientific fields, and he was immediately enthusiastic about the idea of the Academy.

The connection of these three persons finally proved to be the perfect basis for establishing an interdisciplinary and transnational network: The European Academy of Sciences and Arts, founded on March 7, 1990.

THE ACTIVITIES OF THE EUROPEAN PUBLIC LAW ORGANIZATION

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The EPLO was established on 21 June, 2007 as an international organization with headquarters in Athens, Greece, upon the initiative of the Hellenic Republic, through the "Agreement for the Establishment and Statute of the European Public Law Organization", signed by several powers on 27 October, 2004 and open for signature, approval, ratification, by any other. At this stage of development of the EPLO, seventeen (17) countries are represented in its Board of Directors. In order to accomplish its purposes, the EPLO promotes the cooperation with other institutions, organizations and bodies, in particular, organizations in the United Nations system.

Recently, the EPLO has had the honor to be granted an observer status at the General Assembly of the United Nations (UN), the International Labor Organization (ILO), the World Intellectual Property Organization (WIPO) and the International Organization for Migration (IOM). The purpose of the EPLO is the creation and dissemination of knowledge and technical cooperation activities in the area of public law and governance, including inter alia national, comparative and European public law, human rights law, environmental law, international law, human trafficking, anti-corruption, money laundering, anti-terrorism, migration, combatting of poverty, etc., and the promotion of Universal values through law and governance around the world in a dialog of civilizations. To this effect, the Organization organizes and supports scientific, educational, research, training, teaching and technical cooperation activities and provides assistance for institutional cooperation in Europe and worldwide.

THE ASSOCIATION OF PROFESSORS EMERITI OF THE ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS: GOALS AND OBJECTIVES

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The AUEB is a relatively small University with eight departments specializing in the field of Economics, Business Administration, and Applied Informatics. In 2020 the University will celebrate its 100th anniversary. Over the years its graduates have held prominent positions in the Greek Economy as heads of Companies, Public Organizations, Banks as well as in the area of Politics and Higher Education.

Our Association of Professors Emeriti is a very young entity established last year with its first official board elected in March 2019. At present, it has 30 members. Our objectives fall into three major categories:

1) Activities and initiatives which aim at representing the interests of our members, in collaboration with other similar associations and within the newly established federation or professors emeriti.
2) Activities which contribute to the academic reputation and promotion of our University both locally and internationally, through the presence and the research work of our members and through the assistance offered to our University for the accomplishment of its strategic plans which include excellence in research, high quality in undergraduate and graduate education, expansion in new fields of the economy and further accreditation by international bodies.
3) Assistance to our students and graduates through professional advice, mentoring, and career counselling and through joining forces with our career office in its initiatives to fight unemployment.

We believe that our principal goal is to serve our Institution, our students, our graduates, and the Greek society in general, through lessons drawn from our long years of experience in economic and administrative matters.

THE FEDERATION OF THE ASSOCIATIONS OF PROFESSORS EMERITI OF GREECE

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In Greece, so far, there have been founded four Bodies of Professors Emeriti and Retired Professors: a) The Body of Professors Emeriti of University of Athens, founded in 1979. b) The Body of Professors Emeriti of Universities of North Greece, founded in 1999. c) The Body of Professors Emeriti of Technical University of Athens, founded in 2017, and d) The Body of Professors Emeriti and Retired Professors of Economical University of Athens, founded in 2018.

The Body of Professors Emeriti of University of Athens, under the Presidency of Prof. Cokkinos, extended its activities by contributing to the founding the European Association of Professors Emeriti, in October 2016 and by taking the initiative to create the Federation of the Associations of Professors Emeriti of Greece.

Recently, it was decided by representatives of the four Bodies to create a Federation of the Associations of Professors Emeriti of Greece, in April 2019. The main principles of the new Federation are as follows: Each Body is equal and has the same number of representatives in the General Assembly of the Federation. The Presidency will change after two years according to founding seniority. In addition to that the General Secretary will stay in the Athens office of the Body of Professor Emeriti of University of Athens.

Now, we are in an agreement to apply to the Court of the Peace of Athens for approval of the Statutes for the creation of Federation. The main purpose of the creation of the new Federation is to strengthen the presence of Professors Emeriti, over Greece and Europe, in education, science and society. My presentation will focus on the main points of the Statutes of the new Federation.

A STUDENTS' PERCEPTION OF THE ROLE OF PROFESSORS EMERITI IN EDUCATION

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The role of medicine in society and the relationship between doctors and patients is constantly changing. Thus, the content

and delivery of medical education must also continue to evolve to ensure that medical students receive the necessary skills and knowledge to offer high quality medical services.
In this roller coaster of medical advancements, new challenges and new knowledge, the role of all contributors of medical education is crucial. Students with their active participation and engagement together with the academic personnel should constantly strive to offer to society well educated, well trained and sensitive doctors. Professors Emeriti with their precious guidance and consultation can play a catalytic role in the medical education process. Because of their long experience and contribution to medicine, their assistance as educators and coaches is more than necessary and truly welcomed from us, medical students. From areas of research to personal development, as well as in public health issues and government advocacy, Professors Emeriti and medical students can together make a strong impact for the better.
We as HelMSIC - Hellenic Medical Students' International Committee envision a society of medical students and future physicians equipped with values and social conception in order to promote humanism and a holistic approach to medicine. Through our activities HelMSIC inspires the cultivation of character strengths, behavior and skills of medical students, in an environment of acceptance and collegiality. Therefore, we believe that a future collaboration between Professors Emeriti and HelMSIC would flourish our efforts and consist a great offer to medical education.

Symposium: "Back to Learning - The role of Mentorship" Συμπόσιο: Επιστροφή στη Γνώση - Ο ρόλος του Μέντορος

MENTORING EXPERIENCE AND MEANING. FROM THE SOCRATIC APPROACH TO THE NEW SCIENCE OF LEARNING

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Mentoring as a desired practice in educational organizations has come to the forefront in discussions about learning and teaching in recent decades. How to develop good practices as mentors/teachers in general and as professors in our institutions of higher education? Mentoring as a concept in educational theory in the European traditions is closely connected to what has been called *the Socratic Method*. The role of the teacher was to be an interlocutor, a partner to converse with for young people. Questions and reflections should help to develop young peoples' curiosity and engagement in the search for new knowledge. Through conversations should their inherent understanding and insights be captured and deepened. Thanks to Plato's writings are his methods known today and was available for Plato's most famous student, Aristoteles. *The Socratic turn* was to turn away from mere perceptual knowledge and attempted explanations of external things. It was a turn away from spectator or auditor knowledge. The Socratic turn had to do with respect for competence and the work of practitioners. It was a turn to practice or a practical turn. Aristoteles, following Socrates and Plato, developed his thinking about learning taking practical craft competence as his "self-evident" starting point and model. This understanding of learning and knowledge is congruent with an apprenticeship model of learning. In this model the activity itself is the rotation point for learning, whether you are making a table, operating a patient, or writing a thesis, Mentoring and teaching take place in an interaction between the learner, the masters and other learners. It is a revolutionary way of thinking about learning and teaching. Mentoring by the master and mentoring each other are the central aspects in the learning processes. The mentors' role is to prepare the ground and provide conditions for interaction and cooperation among the students in workshops and to give guidance. This way of perceiving learning and mentoring was developed further in the past century by great thinkers like Johan Dewey, Maria Montessorri and Lev Vygotsky. Lev Vygotsky's saying: "*Neither the mind, nor the hand can do much alone. The deed is brought to fruition through activity and cooperation"* points towards transcending traditional perceptions in the present social organization of knowledge in education.

THE SIGNIFICANCE OF THE UBC EMERITUS COLLEGE AND ITS SYMPOSIUM

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In recognition of the contributions and future potential of UBC Emeriti, the University of British Columbia and its Association of Professors Emeriti created an Emeritus College at UBC in 2018 – the first of is kind in Canada and one of only a few in North America. The College is an official part of the university and reports to the UBC Provost and Vice-President Academic. Our last initiative as the UBCAPE was both to create a proposal for the College and approve an annual prize for Research Innovation and Creativity. The idea of the prize is to encourage and recognize emeriti who draw on their long careers as professors to develop new directions and activities unique to senior scholars after their retirement. At the College we are working productively as a group, putting our energies toward being creative and unique. And thus on April 11-12, 2019, the UBC Emeritus College officially celebrated its founding by holding an interdisciplinary symposium on "Scholarship and the Future University." In these and other ways, the Emeritus College expects to enable emeriti to form

and strengthen intellectual, social, and community volunteer networks and embark upon new research and artistic collaborations, community service, and mentorship roles within Canada and internationally.
This brief talk is meant to share with our gratifying experiences of the past year.

TEACHING THE IDEA OF EUROPE: THREE EPIC MOMENTS

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While politics, economy and broader geopolitical considerations form the core of discussions and publications on the present and future of the European Union, the question of the "Idea of Europe" tends to be formulated in mostly cultural terms, with the idea of a common spiritual and intellectual heritage playing an important role. Still, despite a widely shared sense of cultural unity, intellectuals, historians, historians of ideas and sociologists have variously pronounced themselves on the historical period in which a European conscience began to take shape.
As a contribution to this on-going discussion, it is important to underline the special position held by three monumental epics of European literature, namely, Homer's *Iliad* and *Odyssey*, Virgil's *Aeneid* and Dante's *Divine Comedy*. Homer's epics, the final and highly-wrought product of a long oral tradition of epic songs, are seminal narratives about fundamental aspects of the human condition while also offering models of individual excellence and heroism; the *Aeneid*, while being heavily indebted to Homer, injects into the Homeric form the politics and the ideology of imperialist power but not without pondering the human cost of the will to power; the *Divine Comedy* in turn sees in Virgil's worldly imperium the divinely ordained space for the establishment of Christianity. The terms posed by these three monumental works account for much of the spiritual and intellectual history of Europe and, by extension, of the "Idea of Europe".

MENTORING AND CONTINUOUS MEDICAL EDUCATION OF CARDIOLOGISTS IN EUROPE

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Continuous medical education and continuous professional development have been recognised for many decades as the main pillars of a qualitative professional development that is capable of meeting the challenges and difficulties of today's highly competitive reality. Fortunately for healthcare professionals and individual doctors, there is a wealth of means and opportunities for continuing medical education available today.
Undoubtedly, the contribution of digital information to the development of continuing postgraduate medical education has been invaluable. In contrast, the working conditions and the demands of everyday life, particularly in hospitals, have significantly reduced the opportunities for developing mentoring in teacher and student relationships. Nevertheless, mentoring offers values, potentials and prospects that it would be hard to replace with the various events, tools and simulators available today.
As has been proven over the course of centuries, it is precisely this kind of contact that gives young people the chance to become educated, not only in specific medical disciplines, but, more broadly, in strategic organisation, which may play a decisive role in a person's entire vocational career or even in their daily life.
It is a fact that some medical study programmes, such as undergraduate studies at Maastricht University School of Medicine, involve both mentorship and tutorship as key factors. Unfortunately, this example is not widely followed in undergraduate and postgraduate medical studies today.
The European Society of Cardiology, having recognised the value of continuing professional development, is systematically scheduling courses whose aim and reach are not confined strictly to medical knowledge, but extend to areas such as leadership, management and how-to-make-it courses, so that the younger experts may develop skills and capabilities that are especially necessary today.

RETURN TO THE CLASSICS

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It is an unfortunate fact that in educational programmes classical education has been sidelined for a long time now, mainly in Greece, and to a far lesser extent in Italy, the two countries of classical antiquity that created the great Greco-Roman civilization on which Europe has been built. In late 2010 in Italy, a collective action named «Classici contro» dealt with this unpleasant reality, one so ominous for Classical Letters, featuring the timeless value of the thought of the classics, which enables man to deal with the problems of modern world society. Ca' Foscari University of Venice, in an effort led by Alberto Camerotto, Professor of Greek Language and Literature, and Filippomaria Pontani, Professor of Classical Philology, took the initiative to turn to society. In historic theatres of Italy expert scientists speak freely before the audience on crucial matters preoccupying citizens of any era, while at the same time highlighting the wisdom of the classical ancient authors through the tragedies and comedies of the Athenian theatre on equivalent issues of the antiquity, such as democracy, justice, and freedom of speech, as well as tyranny, demagoguery, populism, and xenophobia.

In 1996 the Greek Ministry of Education initiated an effort to create a European Centre of Classical Letters through cooperation between Greece and Italy with the aim of preserving the common cultural heritage containing the necessary elements that bring together the young in an effort to continue building a United Europe of values. Later on, in 2003, during the Greek presidency of the Council of the European Union, as a Special Secretary of the Ministry of Education, I had the honor to organize an international conference on the same subject in Athens and in the symbolic place of Delphi. Personages of the classical letters, acting as representatives from all member states of the European Union, as well as from non-member states, have supported the establishment of this Centre and noted its activities. Unfortunately, these initiatives were afterwards forgotten and the vision of the creation of a Centre of Classical Letters has remained unfulfilled. Recently, Professors Th. Papaghelis and A. Regakos, of Thessaloniki University, along with the rector of the same university, announced the foundation of a Centre of Archaeognostic Sciences.

Today, as humanistic values seem to have been forgotten, conditions have matured and it is imperative to move ahead. I believe that during the first international conference of the European Association of Professors Emeriti the message that must be heard is that there should be a centre of classical archaeognostic studies in Greece. This is why we invited Professor Theodore Papanghelis, to speak on the importance of the knowledge of classical antiquity for the education of the young and the european conscience.

PLANS TO EXPAND THE ACTIVITIES OF THE EMERITUS COLLEGE, THE UNIVERSITY OF BRITISH COLUMBIA, AND CANADA

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Established just one year ago, the Emeritus College at The University of British Columbia is the first academic unit of its kind in Canada. The college is unique in that its members represent every discipline and field within the university but has no teaching responsibilities. The new presence of Emeriti in the university and the outstanding support from the administration inevitably creates new expectations. What follows is a brief account of some of the plans that we are considering:

- An annual symposium that draws together research on the scholarship in the future university.
- Emeritus College Visiting Professors
- Public Interest/Community Outreach Seminars
- Innovation and Research Prize
- The creation of a series of fellowships to support students at UBC who are over 65 years of age

Special Lecture
Ειδική Διάλεξη

GIVING OTHERS THE CHANCE WE HAD, THE CHALLENGE OF FAIR ACCESS TO UNIVERSITY

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Studying at university remains a life changing experience for many young people today, but the opportunity is still not available for all who have the potential to succeed in higher education and the wish to do so. Barriers remain in virtually every country in the world. You are much more likely to go to university if your parents went or if they are rich. Often ethnicity, religion or socio-economic class determine your chances and, in some countries, where you are born or your gender remain important. In our increasingly knowledge-based economies, this lack of access to higher education is not only wasteful of talent but it is economically damaging. In a democracy, such blatant disregard for equity is also socially and politically damaging. Consequently, many countries are now enacting policies to provide fairer access to higher education. This talk will draw on the author's experience, both as a University leader and a Government appointed independent regulator of 'Fair Access to Higher Education' in England. The scale of the problem and its root causes will be illustrated and global comparisons given. Some of the activities being promoted to provide fairer access and widen participation in higher education will be discussed. These will include the role of scholarships, grants, loans and fees and their effect on participation. The importance of raising both aspiration and achievement amongst school leavers will be illustrated, as will the importance of long-term strategic outreach programmes. Opportunities for Governments, Universities, charities and retired academics to get involved will be outlined.

Saturday, June 1 2019

The Contribution of Professors Emeriti to Science
Η Συμβολή των Ομοτίμων Καθηγητών στις Επιστήμες

SCIENCE AND FICTION: THE CASE OF THE PERIODIC TABLE

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The year 2019 has been proclaimed by The United Nations the International Year of the Periodic Table of Chemical Elements, to "coincide with the 150th anniversary of the discovery of the Periodic System by Dmitry Mendeleev in 1869, a unique tool enabling scientists to predict the appearance and properties of matter on Earth and in the Universe."
The establishment of the Periodic Table indeed has been one of the major breakthroughs in chemistry in the middle of the 19th Century. The history of the realization that the chemical elements can be ordered in a peculiar tabular form according to their respective physical properties, is to be reflected. A closer look reveals that the conception of the Periodic Table was rather based upon a gradually emerging perception that the elements, as they became known step by step, follow certain regularities in atomic weight differences, atomic volume, or similarities in their chemical properties. Starting in the 1820s with the triad rule by Döbereiner, the law of octaves by Newland in 1864, and the presentation of the elements in tabular form by Meyer in 1864, most of the basic concepts were known when Mendeleev published his periodic table in 1869. Therefore, the difficult decision whom to honor as the true "discoverer" remains a perennial science-ethical question, as is the case for many other fundamental discoveries in science.

THE CONTRIBUTION OF PROFESSORS' EMERITI EXPERIENCE IN THE CONTEMPORARY ACADEMIC SOCIETY

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Experience as defined by Aristotle is the *recollection of consolidated knowledge*.
This work refers to the utilization of knowledge and long-term clinical experience of Professors Emeriti, virtues that can prove to be a beacon that sheds light onto the darken voids of the galloping technological advances in Science. It focuses on the effect of the technology, which has immensely contributed to Clinical Medicine over the past thirty years.
However, there has been a progressive and intense reversal in the humanistic aspect of the doctor-patient relationship that undermines the noble Hippocratic Code of Medical Practice and perhaps that of Medical Research.
The recent financial crisis has contributed to a continuous degradation of the values, principles and traditions and has inevitably given rise to the *Hippocratic Deficiency Syndrome.*
At present the invaluable Medical Service as accepted by modern society worldwide, suffers. The expert advice, which Professors Emeriti can readily provide to the Healthcare Service and especially to the Academic Education, must therefore be deemed essential to halt, overturn and cure this pathogenic *Syndrome* that affects the Medical Practice.

THE YOUNG AS "HONORARY OLDS". THE OTHER END OF THE EMERITI SPECTRUM

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The European Association of Professors Emeriti (EAPE) is a young Association with old members. The foundation stone of its claims for participation of its members into the scientific and cultural milieu after their retirement is the dictum that although they are old they are still active and productive having also an accumulated experience. This is absolutely true, in spite of the pun written by Simone de Beauvoir that *"there is one form of experience that belongs only to those that are old – that of old age itself."* Thus, they aspire to be considered *honorary young* and capable of procreation at least in the cultural sense. The aim of this paper is to study the historical basis of this claim and mainly to pinpoint the fact that in some historical periods and distinct sects it was thought that wisdom and efficiency was their characteristic because they were old. Consequently, if a relatively young person acquired these properties he/she was called "senator" a term deriving etymologically from the Latin "senax" or "geron" from the Greek "geras" meaning old. Governments, e.g. the American Senate and religious bodies are a characteristic example of the reverse meaning of the hierarchical *old*. When capable youngers are elected are called senator and when become abbots are still called "gerontes" in the Orthodox Church independently of age. In the other end of Europe, in the Church of Scotland the heads of a congregation are also called "elders" appointed exclusively on their merits. All these *honorary olds* represent the other end of the emeriti spectrum. We elaborate further on the issue.

THE CONTINUOUS CONTRIBUTION OF PROFESSORS EMERITI TO THE CONTINUING POSTGRADUATE MEDICAL EDUCATION

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An Emeritus Professor of Medicine could be active in various fields, such as: teaching, lecturing, advising PhD thesis, guiding young physicians to writing a scientific paper and, most importantly, contributing to the field of continuing postgraduate education, in his/her specialty. After my election as Professor of Pathology in November 1990 in the Medical School of the University of Ioannina, I was seriously thinking how to fulfill the void in continuing education. In the Spring of 1995, after the preparation of the bylaws, I applied to the Executive Committee of the European Society of Pathology and was officially appointed as the Director and Organizer of such Courses. One year later, the first IUCP (Ioannina University Courses in Pathology), in the field of Gynaecological Pathology/Oncology was held, and its success gave me the strength to continue organizing IUCP biannually. Needless to mention that after my retirement on August 31st of 2007 and up to now, this is my main activity as a Professor Emeritus.
After the experience gained from the first course, a number of distinguished Clinicians were gradually incorporated in the list of invited speakers. Each course has been designed for 30-35 Pathologists and Clinical Colleagues related to the subject, and its duration is approximately 2 days (~13½ credit hours). Over the years, besides Greek students, we also had participants from the Balkans and other European and Middle East countries. In the First Series sixteen courses were offered, in the Second Series twelve courses have been offered and we are currently in the Third Series. The latest IUCP course (the 35th) on Gastrointestinal Pathology/Oncology was held on March 2018.
During my long career in organizing the IUCP, I have faced several challenges and I have learned a lot from hands-on experience. I believe that the organization of the IUCP has significantly contributed to the field of Continuing Medical Education in Europe.

BIOETHICS ISSUES IN EXPLORING SPACE

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Space travel now seems more like a possibility rather than science fiction, which poses a series of moral dilemmas and questions that we must approach responsibly. In this article we explore some of the social, economic and political issues arising from this possibility and make a critical evaluation of the reasons for space exploration. The usual ethical issues related to environment and security are just the tip of the iceberg and we will not focus on them here. Instead, there are many other interesting questions, such as: What would be a fair process for commercializing or granting property rights in space (as opposed to a chaotic land-grab similar to the case with Internet domain names)? How likely would a secessionist movement be among settlements? Are there any reasons, such as adventure wandering, or the creation of a backup biosphere, strong enough to justify space exploration? Our point is not that we should refrain from space exploration, but that if we want to move forward with our journey, which is anyway unstoppable, we should seriously consider these issues.

THE SIGNIFICANCE OF TRANSDISCIPLINARY RESEARCH AND OF COOPERATION BETWEEN SOCIAL SCIENCES AND THE HUMANITIES WITH BIOMEDICAL SCIENCES FOR THE DEVELOPMENT OF SCIENTIFIC KNOWLEDGE AND THE REALIZATION OF THE MODEL/THE PRACTICE OF INTEGRATED STUDIES

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We live in the age of the rise of scientific positivism, methodological particularism and disciplinary chaos. We are witnesses of the processes of the destruction of the mind, unreasonable particularization of the work process, the fragmentation of the scientific system into numerous disciplines and courses, and the marginalization of philosophy, social sciences and the humanities. The university community of the *homo academicus* seems to be getting further atomized and enclosed into specialized fortresses, producing thereby people specializing in extremely limited areas in which they act with perfect precision, but who are unaware of the broader picture and uninterested in social affairs. The challenge we are therefore facing is: *what we are to do stop the given trend and improve the development of science and of university education*.
The paper problematizes the importance of the development of multidisciplinary and transdisciplinary research, especially the cooperation between biomedical sciences, on the one hand, and social sciences and the humanities, on the other hand, for the improvement of the complex findings about man, health, and society. It also points to why such research is of key importance for the creation and improvement of the university practice of integrated studies.
The author holds the view that scientific progress is dependent both on specialist studies in natural, biomedical and information sciences, and on new forms of cooperation and integration in contemporary science, and urges for big syntheses of the given research areas with philosophy and other humanities and social sciences. Answers to numerous complex issues – what is life, man, society, sustainable development, and what

are optimal directions of the future progress of mankind, are to be sought in opening up of all sciences and their multidisciplinary cooperation / communication.
If the era of globalization knows no borders, then such a cooperation presupposes a developed network of international scientific and interuniversity cooperation, as well as mobility of the scientific elite, so that exchange of discoveries and innovations could foster the practice of scientific, academic, health and social institutions across the world. The author especially points to the importance of the research within biomedical sciences, social sciences and the humanities in genetics, ecology, anthropology, demographics, psychology and sociology.

A LONG-TERM RESEARCH: UTILIZATION OF INDUSTRIAL BY PRODUCTS - RECOVERY OF CRITICAL ELEMENTS FROM BAUXITE RESIDUE

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An industrial by-product is a production residue from an industrial process that is not a waste, with a minor net realizable value (NRV) when compared with the main products. However, a by- product can be useful and marketable. Bauxite residue (BR), also called red mud, is the by-product after Bayer process for alumina production having a highly alkalinity. Its huge global annual production ~120 million tons has resulted in BR increasing accumulation, causing deposition problems and serious environmental impacts. The valorization of BR as a secondary raw material and as a metal resource of low cost could be a route for its reduction introducing this by-product again in the economic cycle. BR is rich in minerals and metals of high economical interest. It contains oxides and salts of the main elements Fe, Al, Ca, Na, Si, Ti and numerous trace elements such as V, Cr, Zn, Ga, Nb, Zr and Ta as well as rare earths–REEs (Sc, Y, lanthanides).
In Greece, Mytilineos S.A. former 'Aluminum of Greece' (AoG) produces annually about 750,000 tons of BR, which is characterized as chemically stable. It is found in an over 25 years investigation from our Lab, that Greek BR is rich in REEs especially in scandium (Sc), close to its main resources. REEs and especially Sc are elements of high techno-economical interest because of their use in high-tech materials and modern applications. Scandium is exceptionally expensive with increasing demand in advanced technology applications, such as Al-Sc alloys for the aerospace and defense industry, electrolyte in solid oxide fuel cells etc. European Commission's classification of Critical Raw Materials (CRMs) ranks Sc as critically high on both supply risk and economic importance due to the decreasing available stockpiles combined with the globally limited production and the evolution of new applications, rendering its selective recovery attractive for industrial scale exploitation. In this presentation an innovative method developed in our Lab for the recovery of REEs and especially Sc from Greek bauxite residue will be demonstrated. The selective separation and purification of REEs from the main elements of the matrix, such as iron, were achieved by several physicochemical processes including acid leaching, ion exchange, selective extraction/back-stripping and chromatographic separation. The experiments were performed in lab scale and scaled up to a pilot plant. The reagents as well as the different working conditions were selected taken into account environmental and economic aspects. The proposed method will be applied in an industrial scale in the premises of Mytilineos S.A. (largest Greek alumina and aluminum producer) in the framework of an ongoing European Community's Horizon 2020 Program.

THE ROLE OF EMERITI PROFESSORS TO THE KNOWLEDGE TRANSFER (KT) AND TECHNOLOGY

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Science and research are important for understanding the world and the universe. Universities and research organizations have contributed significantly to the creation of new knowledge through basic research, to the development of new technologies for detectors and accelerators, to the improvement of Information and Communication Technologies, to the training of the engineers of the future and to the unification of scientists and people from all countries and cultures.
The transfer of knowledge and technology (KT) aims to engage experts in science, technology and industry in order to create opportunities for transfer of technology and know-how. The basic goal is to create innovation and transfer a positive impact on society that enriches humanity.
There are various basic modes for technology transfer from the public research sector to the business sector, like the non-commercial transfer (seminars, publications etc.), the commercial transfer (consulting, licensing etc.) and the new company generation (direct and indirect spin-offs, technology transfer companies, start-up companies etc.). One interesting and important example of Knowledge Transfer is the innovative ideas and technologies from physics which have contributed to great advances in medicine, in particular radiation-based medical diagnosis and treatment.
Emeriti Professors from different fields of research and from Universities of various countries could play a very important role in giving momentum to the Knowledge Transfer (KT) by using their experience. They could join their efforts in order to establish collaborations with partners, to exchange their

ideas and to finally achieve developing projects, new research grids and international collaborations towards admirable future perspectives!

Special Lecture
Ειδική Διάλεξη

THE POLITICAL DIFFICULTIES CONCERNING CLIMATE CHANGE AND NEGATIVE EMISSIONS

Lars Walløe

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EASAC – the European Academies' Science Advisory Council – is formed by the national science academies of the EU Member States, Norway and Switzerland to enable them to collaborate with each other in providing independent, evidence-based science advice to European policy-makers, especially to the Commission, the Parliament and the national governments. A controversial issue in discussions and decisions both in the EU and in national governments about climate change mitigations have lately been the development of negative emission technologies (NETs) and the use of forest biomass instead of coal in electricity generation.

As global emissions of carbon dioxide (CO_2) continue to exceed levels compatible with achieving Paris Agreement targets, attention has been focusing on the role of bioenergy as a 'renewable' energy source and its potential for removing CO_2 from the atmosphere. EASAC examined these issues in two reports in 2017/18, but since then many peer-reviewed papers and international reviews have been published. EASAC has thus revisited these important issues and updated its earlier findings in a Commentary from February this year.

Carbon capture and storage (CCS) – which is critical to several NETs – will need to be developed and deployed rapidly. Nevertheless, EASAC emphasises – in line with its 2018 report - that mitigation must remain the highest priority. CCS technologies cannot make up for a lack of effort to mitigate CO_2. EASAC noted the danger of moral hazard in accepting as legitimate future scenarios that are based on assumed CCS of many gigatonnes of CO_2 each year via unproven technologies. On bioenergy, switching from coal to imported biomass continues at many millions of tons per year, driven by rules that allow this to be counted as zero emissions at the combustion stage, and thus help to reduce countries' emissions declared in the EU emissions trading system. However, the science showing the extent of perverse effects has become stronger and that this policy is bringing forward the date when we overshoot the Paris targets and increase the risk of dangerous climate change.

Multi-functionality and sustainability of the Europeans forests. EASAC policy report 32, 43pp, 2017.
Negative emission technologies: what role in meeting Paris agreement targets? EASAC policy report 35, 37pp, 2018.
Forest bioenergy, carbon capture and storage, and carbon dioxide removal: an update. EASAC commentary, 11pp, 2019.

Health in our Society
Η Υγεία στην Κοινωνία μας

BUILDING HEALTH PROMOTION

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The historical perspective of Health (considered as a divine gift in Ancient Greece until Hippocrates challenged this misconception) the "over inclusiveness" of the World Health Organization definition (1948), the necessity of health promotion and the means by which this can be implemented are examined in this presentation. The Socio-political activities (like reduction of unemployment, improvement of schooling, prevention of conflicts and protection of civil economic, social, political and cultured rights) that promote health are highlighted.

Additionally, Peace as a target of mental health promotion (WHO, 2004) and the Athens Anti-War Declaration (2016) co-signed by more than 100 organizations are presented and discussed. The holistic character of health promotion is underlined and the target population is defined. The effectiveness and sustainability of health promotion is further discussed.

It is concluded that the aim of health promotion should be to apply the person-centered holistic approach into strategies that will enhance the resilience of people and improve their wellbeing and quality of life on a personal and social level.

THE DILEMMAS OF SEX ASSIGNMENT ON THE OCCASION OF A PRISMATIC CASE

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Sex assignment or reassignment, a highly controversial issue, constitute a unique challenge for physicians, parents and the affected individual. Up until recently the anatomy and the functioning potential of the genital system primarily determined the choice of sex of rearing.

Current knowledge, however, related to brain masculinization by prenatal androgens, as well asfluidity and the potential of metamorphosis of the affected individual during adolescence,

has further complicated pertinent decisions. In our society, ambiguous genitalia is perceived as a social stigma, whereas in ancient Greece Hermaphroditus and Daphne were celebrated and incorporated in the society.
A unique paradigm of hermaphroditism, here in presented, illustrates these points. A baby born in a small Greek island, was assigned female sex and named Catherine.
At the age of one month the mother noticed enlarged clitoris but no evaluation was carried out. At age 8 years the child was examined at the pediatric clinic of Athens medical school. There was an obvious disharmony between the sex of rearing and the external genitalia, and the Chromosomes were male (46 XY). The parents did not want further investigation at this point. When they returned, at age 15, Catherine had undergone a metamorphosis looking like a male adolescent. The hormonal profile showed increased androgens, indicative of 17 HSD deficiency, confirmed by DNA analysis.
A decision had to be made concerning sex reassignment. There was no ideal solution.
A series of consultations with psychiatrist, surgeon and endocrinologist, as well as, long discussions with parents and Catherine took place. The dilemmas involved and the final outcome will be discussed.

HEALTHY NUTRITION - NEWER "REVOLUTIONARY" DATA

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Healthy nutrition is certainly a subject of universal interest. As expected many epidemiological, clinical and laboratory studies have been conducted concerning the effects of nutrition on atherogenesis, cancer genesis and longevity. Although some classical beliefs remain unchanged, a large body of recent data has upset or has put in doubt some previous «dogmas». One of the numerous problems concerning epidemiological research on nutrition is that it is very difficult to obtain high quality data based on long term randomized controlled studies.
The up to date acceptances based on recent scientific data could be summarized as follows:

ANIMAL FAT
Eggs: Innocent and beneficial (no more "guilty")
Dairy: Most probably innocent and beneficial (previously "condemned")
Red meat: Harmful in large amounts in spite of contradictory studies. Do not forget carcinogenesis
Processed meat: harmful
Trans fatty acids: harmful

VEGETABLE OILS
Polyunsaturated: Most probably beneficial
Monounsaturated (fe olive oil): Beneficial
ω3 fatty acids (fatty fish): Most probably not beneficial in spite of previous beliefs

CARBOHYDRATE - RICH FOODS
Complex (large molecules) carbohydrates: rather beneficial, especially those with high fiber content (fe legumes and vegetables)
Sugars: Harmful
FRUITS: Beneficial
SALT: Above a certain limit harmful
ALCOHOL: Probably beneficial in moderation. However, quite recent data show that there is no any safe upper limit of intake
NUTS: Beneficial (Attention to calories)

NOTE: It is emphasized that the important thing is the combination of nutritional substances and not the isolated substances per se.

NEUROBIOLOGICAL AND ANTHROPOLOGICAL ASPECTS OF NEUROESTHETICS

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Paul Klee wrote several years ago: "Art does not reproduce what we see. It makes us see". Similarly Constantin Brancusi wrote several years ago too: "reality is not the external form but the essence of things….it is impossible for anyone to express anything essentially real by imitating its exterior surface". The ideas of those two famous artists do not differ significantly with what Ulric Neisser, one of the founders of cognitive psychology, wrote few decades ago: "….we have no direct immediate access to the world, nor to any of his properties….Whatever we know about reality has been mediated not only by the organs of sense but by complex systems which interpret and reinterpret sensory information".
Taking together the above quotes I suppose that I can suggest that *art makes things visible by activating those complex brain mechanisms which interpret and reinterpret the sensory information.* But which are the fundamental characteristics of those mechanisms?
For the brain the only knowledge that is worth acquiring is knowledge about the enduring and characteristic properties of the world; the brain is consequently only interested in the constant, non-changing, permanent and characteristic properties of objects, those characteristics which enable it to categorize objects.
Human brain has the ability to conceptualize, to abstract, to see something that is not there.

THE ROLE OF PROFESSORS EMERITI IN CONTINUING EDUCATION AND RESEARCH

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Emeriti Professors are usually recognized at an International level as leading academicians and researchers in their fields. Professional leadership has been achieved through their life time experience in teaching and innovative research. Accumulated evidence from several universities and research Institutes has revealed that baby-boomers, Emeriti Professors, can effectively provide guidance and assistance in developing new teaching curricula for undergraduate and post graduate studies, and attract substantial grants from the European Commission and the industry to conduct pan-European comparative research. The presentation will focus on the role of Emeriti Professors in conducting teaching and comparative research in the area of Societal Health and Well-being. The concept of health in our society expands through new types of governance, regulations, and new forms of public-private partnerships. The presentation will make a brief reference to several research initiatives developed by the WHO and the European Commission under the Millennium Development Goals, the Health in All Policies, the Horizon 2020 programs entitled: "Europe in a changing world-Inclusive, Innovative and Reflective Societies. Reference will also be made to the European Research platforms and the European Research networks aiming at the investigation of Health Inequalities and the research triangle of Health-Wealth and Wellbeing. The main research findings of some indicative research programmes will be briefly discussed and the role of Emeriti Professors in fostering excellence in research and teaching will be analysed. The experience from an Erasmus + Mundus programme conducted by the University of Athens in collaboration with 6 other European Universities will be discussed.

PHILOSOPHY AND NEUROSCIENCES

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Philosophy and neurosciences have a parallel historical evolution, since philosophy is and advanced and elaborated product of cognition and neurosciences, on the other hand, obtain their real meaning, whenever they are associated with philosophy. Philosophy of Neurosciences basically concerns philosophical issues within the field of neurosciences involving also scientific concepts for interpretation of philosophical doctrines. Neurosciences without philosophy have a limited materialistic profile, conceptualizing that mental phenomena are identical to neural phenomena. The concept of consciousness has an important place in philosophy of mind and discoveries in the field of neurosciences stimulate debates on the nature of consciousness and the various neurophysiological mechanisms of the conscious experience. Nevertheless, in spite of extensive experimental work, there is not a conclusive explanation of consciousness at the level of neural mechanism. From the philosophical and neuropsychological point of view the consciousness has a personal character since its interior dimension plays an important role in shaping the profile of the personality and defining the basic behavioral pattern of each person. The senso-sensorial perception and the sensory coding system is also a main topic of the philosophy of neurosciences. A purely neurobiological explanation of mental and psychological phenomena leads to dissolution and ambiguity, which concern the interior life, the emotions and the spiritual life of the human being. Neurosciences must have a deep philosophical import in order to have a substantial relevance to harmonious interactions between mind and soul.

UNRAVELING THE INCIDENCE AND CLINICAL PATTERNS OF NEUROENDOCRINE NEOPLASMS IN GREECE, THROUGH THE EXPERIENCE OF MULTIPOTENT, SPECIALIZED CLINICAL CENTERS

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Introduction: Neuroendocrine neoplasms (NENs) are a heterogeneous group of tumors arising from neuroendocrine cells in the endocrine and central nervous system, the natural history of which remains inadequately understood. Large epidemiological studies are gradually emerging from different countries worldwide, which contribute to the establishment of a spherical view about these tumors.
Aim/Purpose: The purpose of this study is to evaluate the epidemiological, clinical and pathological characteristics of patients with NENs that have visited the specialized, multipotent medical center of a University Hospital in Athens, Greece.
Subjects/Methods: Three hundred and eleven (311) patients with NENs were recruited at the specialized, outpatient Medical Center of Neuroendocrine Tumors of the Endocrine Department of "Sotiria" University Hospital in Athens, Greece, during the period from September 2013 till the end of 2014. Anthropometric, clinical, laboratory, imaging and pathologic data were obtained from every patient.
Results: 55.9% of patients with NENs were female and 44.1% were male. The mean age at the time of diagnosis was 52.77±16.7 years old. The majority of NENs were detected in

the gastroenteropancreatic system. The most common primary site was stomach (23.8%), followed by pancreas (19.6%) and appendix (12.9%). In 31 patients (10%) the primary tumor remained unknown. Over half of NENs were regional at the time of diagnosis, 18.6% of patients had locally extended disease, while 25.4% of NENs, involving mostly NENs of unknown origin, pancreas and small intestine, were metastatic. Simultaneously, most of them displayed a Ki-67 index of ≤ 2%, while G3 classification, with a high proliferation index was only observed in pancreatic, rectal and rare NENs. Laboratory data revealed that CgA can predict whether a NEN is metastatic or not but cannot predict how aggressive its behavior can be. On the contrary, NSE cannot be used as prognostic marker both in disease extent and grading of NENs. Finally, it was observed that patients with CgA levels in the highest quartile (CgA>237 ng/ml) displayed 8 times higher risk for being metastatic at the time of diagnosis (OR=8.643, 95% CI=2.576- 9.0).

Conclusion: This is one of the first large, epidemiological studies in Greece, evaluating the natural course of NENs through the experience of a specialized medical center. NENs of the gastroenteropancreatic system were most common, mainly regional at the time of diagnosis and with a a Ki-67 index of ≤2%. CgA can be a useful marker in predicting disease extent of NENs.

SURGE AND RETREAT IN THE HISTORY OF MALARIA

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Malaria predates the evolution of humankind and yet remains one of the most serious health-related threats on the planet, killing hundreds of thousands of its victims each year, primarily in sub-Saharan Africa, and causing severe suffering for hundreds of millions of people. Moreover, contemporary medical historians argue that the period between the mid-nineteenth century and the interwar years marks the most extensive distribution of the disease worldwide. This paper discusses several of the main factors that have contributed to variations in the global, regional and local spread and retreat of malaria incidence. Some of these factors, such the effects of climatological shifts and evolutionary pressures, are long-term and relate to the *longue durée*; others, such as migration, economic development and malaria control programs, affect the mid-term; and others, for instance local variations in rainfall, political events and military operations, are more immediate in their impact. In fact, recent scholarship has shown particular interest in studies at the micro-environmental level. Greece, the most heavily malarious country in Europe until the mid-1970s and the one most seriously affected by the lethal form of the disease, i.e. falciparum malaria, offers a wide range of data for the study of the history of malaria.

Abstracts published but not presented
Περιλήψεις δημοσιευθείσες αλλά όχι παρουσιασθείσες

SALINIZATION IN COSTAL GROUNDWATER OF GREECE AND ITS INFLUENCE ON THE RISKS OF HEAVY METALS

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Distribution of the most frequent metal/metalloids (As, Cd, Cr, Cu, Hg, Pb, Zn, Sb, Co and Ni) in the system soil-groundwater-plants (European Soil Data Centre or ESDAC) has shown their bio-availability, bio-accumulation and a major effect on the human health and ecosystems. The presence of those harmful elements in soils may be related with human activities, such as transfer of weathered material from rocks and ores (primary raw materials) or wastes, surrounding cultivated basins, the application of large amounts of fertilizers and pesticides for long time in the cultivated areas, and/or natural processes. Also, an increasing trend between Pt, Pd and Rh contents along roadsides (derived from the catalytic converters of cars) in plants and the corresponding soils, is consistent with their solubility in soils and point to the potential transfer to the food chain (animal and human health).

Although harmful elements in food chain has created an alarming situation for human life and ecosystems, some metals or metalloids, like selenium is necessary for the growth and optimum performance of organisms. Also, dose-dependent differences in toxicities of elements, the particle size and the oxidation state require serious consideration in health risk assessments. Integrated studies of environmental sciences (geochemistry of soil and irrigation water, ecology, agronomy) may delineate potential relationships between the soil mineralogy, mineral chemistry and geochemical composition *versus* composition and physical/chemical characteristics (pH, redox, temperature) of groundwater, food quality, human health, and source(s) of contaminants.

Recently, various nanoparticles or nanomaterials have been found to be very effective for the removal of a wide range of toxic metals from the environment. In general, at cultivated areas located close to contamination sources, could be (a) selected species with low accumulation factors, and avoided crops with higher heavy metal uptake capacity, and (b) applied cost effective methods to reduce metal transfer and decrease the metal accumulation. A negative trend between chromium isotopes (δ^{53}Cr values) *versus* Cr(VI) concentrations in water may suggest that there is an ongoing and relatively efficient process in the composition of groundwater that facilitates natural attenuation of the dissolved and toxic Cr(VI), although

heavy metals may remain in the environment for years, posing long term risks to life well after sources of heavy metal pollution have been removed. There are several techniques to remove these heavy metals, but the most of these techniques become ineffective or expensive. Alternately, bioremediation is an innovative and promising technology available for removal of heavy metals and recovery of the heavy metals in contaminated water and lands. The phytoremediation (plant-based clean up technology) is considered to be a cost effective and environmentally friendly technology, that could be applied in areas of pit-open mining or/and in with areas with intense topography. Therefore, a review of the available database/literature for European countries (and probably additional research in certain areas) could contribute to define contamination/pollution sources, the presence of hotspots, the degree and extent of the soil contamination, which in turn is transferred into groundwater and food chain, in order to propose the appropriate policy.

THE COMBINATION OF CARDIOVASCULAR RISK FACTORS IN PCOS AND THE RISK FOR CARDIOVASCULAR DISEASE EVENTS

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Objectives: PCOS is defined by the presence of hyperandrogenism (clinical and/or biochemical), ovarian dysfunction (oligo-anovulation and/or polycystic ovaries), and the exclusion of related disorders. Women with PCOS appear to have increased number of risk factors compared to healthy, age-matched women at any age. PCOS is not only one of the commonest causes of subfertility in women, but it has also many metabolic consequences. It is associated with insulin resistance and diabetes mellitus, obesity, dyslipidemia as well as alterations of the fibrinolytic system. All the above are independent, traditional cardiovascular risk factors that can predispose women with PCOS to early onset CVD.
The question remains unanswered whether this increased cardiovascular risk in women with PCOS can be translated also to increased cardiovascular events.
Methods: In the next Figure we present the combination and the interaction of the main cardiovascular risk factors in women with PCOS. The CVD factors included and combined are insulin resistance, androgen levels, systolic blood pressure, body mass index (BMI) and androgen levels. Women who have many risk factors are, possibly, at increased risk for cardiovascular events. The different CVD risks are depicted in different colors and the number of co-existing risks that are present in one woman is reflected with the intensity of the color
Discussion: This figure is a scheme, combining common CVD risk factors with and without the presence of hyperandrogenemia, reflecting a unifying approach of CVD risk factors in women with PCOS. This may provide a more individualized assessment of how real is the cardiovascular risk in these women. It may be used as a tool of assessing the potentiality of multiple interconnections of CVD risk factors linked with cardiovascular events in women with PCOS.
Conclusion: This type of combined presentation of CVD risk factors may prove to be of clinical significance in PCOS, as it could help of real-life CVD risk stratification and subsequently prevention or targeted therapeutic management of these patients.

VITREOUS CRYOPRESERVATION OF HLA-MATCHED VASCULAR GRAFTS UTILIZING THE DECELLULARIZED HUMAN UMBILICAL ARTERY

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Background: The development of functional tissue engineered vascular grafts has remained a great challenge over the past decades. Nowadays, autologous or synthetic grafts are routinely used in arterial bypass and reconstructive surgery. However, the most patients lack of sufficient vessels and the synthetic grafts are responsible for adverse reactions. Additionally, the function of transplanted vascular grafts is impaired due to host immune reactions. It is known that mismatches in HLA class I and II could result to failure in solid organ transplantation. More specifically, HLA-DR mismatches are considered to be crucial for the first 6 months after the transplantation, HLA-B for the first 2 years and HLA-A for the overall long term graft survivability. The aim of this study was the development and long term storage of HLA matched vascular grafts utilizing the human umbilical artery (hUA).
Methods: The hUAs were incubated in CHAPS and sodium dodecyl sulfate (SDS) followed by incubation in α-MEM with fetal bovine serum at 37°C. Then, a non equilibrium vitrification approach with the use of VS55 solution was applied and accompanied by storage at -196°C for a time period of 2 years. Histological, and biochemical analysis were performed

for the evaluation of the decellularization and vitrification protocols. The produced vascular grafts were repopulated with Vascular Smooth Muscle Cells (VSMCs) and Endothelial Cells (ECs) derived from patient specific Mesenchymal Stem Cells (MSCs) under static conditions for 4 weeks. Indirect immunofluorescence was performed for the collagen I, whereas the cell nuclei stained with DAPI. Finally, the HLA phenotype was determined in the repopulated vascular grafts by using the Next Generation Sequencing technology. Results: Decellularized and vitrified hUAs were completely free of any cellular and nuclear materials, thus retaining their initial structure and biomechanical properties. Additionally, the vascular grafts successfully repopulated as indicated by the indirect immunofluorescence and fully adopted the HLA phenotype of the patient's specific MSCs.

Conclusions: The results of this study clearly demonstrated the successful production and long-term storage of HLA-matched vascular grafts. No mismatches in HLA genes between MSCs and repopulated hUAs were observed by Next Generation analysis, indicated no evidence for production of chimeric vascular grafts. This fact is quite important, showing though, the successful production of HLA-matched vascular grafts. In this way, no graft allorecognition can be performed by host's innate immune cells, following the transplantation of the HLA–matched vascular graft. Additionally, vitrification approach offers the advantage of readily available vascular grafts, upon demanding. The production of personalized vascular grafts utilizing the human umbilical artery is one step closer to its clinical application.

DEVELOPMENT OF CARDIOVASCULAR IMPLANTS UTILIZING THE HUMAN UMBILICAL ARTERY

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Background: The development of small diameter (<2 mm) vascular grafts has remained a great challenge over the past decades. It is estimated that over of 15 million of patients are suffering from CVD, thus demanding surgical operation. Until now, several vessels have been used as substitutes of damaged coronary arteries. Among them autologous vessels such as saphenous vein and fabricated synthetic vascular grafts made of Dacron and expanded polytetrafluoroethylene (ePTFE) have been applied in cardiovascular surgeries. However, these vascular grafts are accompanied by major adverse reactions, such as thrombus formation, graft calcification and occlusion. In this way, new surgical operation is needed for their replacement. Additionally, only 20% of patients who are suffering from CVD have suitable autologous vessels that can be used in coronary artery bypass. The limited availability of the arterial scaffolds worldwide, has led to alternative approaches.

Objectives: The optimum goal of this study is the production of a cell free arterial scaffold utilizing the human umbilical artery (hUA), which can be cryopreserved over a long time of period.

Methods: The hUAs (n=10) were incubated in CHAPS and sodium dodecyl sulfate (SDS) followed by incubation in α-MEM with fetal bovine serum at 37°C. Then, were vitrified with VS55 solution and stored at -196°C for a time period of 6 months. Histological and biochemical analysis was performed for the evaluation of the effectiveness of decellularization and storage methods. The mechanical properties of the vascular grafts were evaluated with biomechanical analysis. Finally, substitution of common carotid artery with vitrified hUAs in porcine model was performed, in order to assess the functionality of the produced vascular grafts.

Results: Decellularized and vitrified hUAs were completely free of any cellular and nuclear materials while retaining their initial structure and biomechanical properties. Vitrified arteries were successfully transplanted and remodeled after 60 days of implantation in porcine model.

Conclusions: The results of this study clearly demonstrated the success of the current decellulrization and storage method. The human umbilical arteries could possibly serve as an alternative source for the production of personalized small diameter vascular grafts. In addition, these vessels could be used as a model for better understanding the molecular mechanisms of endothelial cell and smooth muscle cell differentiation, proliferation and migration in the vascular wall in order to take full advantage of its clinical potential. Furthermore, tissue engineered vessels characterized by similar mechanical properties as the native ones. Future research is needed for the development of biocompatible tissue substitutes derived from decellularized tissues that can potentially be used in clinical and translational medicine.

ORTHOPAEDIC SURGERY: ON THE CUTTING EDGE IN THE NEW BIO-INTELLIGENCE AGE

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With each breakthrough in knowledge, usually based on new methods of discovery, a new scientific era emerges.

Medicine and surgery have evolved across the ages, with notable landmarks, particularly across the last three ages, agricultural, industrial and information ages. The industrial age is considered the "Golden Age of Surgery", a period marked with new tools, including anesthesia, antisepsis, xrays, and dedicated ORs. The information age was devoted to computer representation, including digital imaging, invasive monitoring, endoscopic and computer-assisted surgery. In an era when medical knowledge has been expanding exponentially, where by some estimates, the body of medical knowledge doubles every 18 months, it is not surprising that we are now entering a new age – the so-called "Fourth Wave" or "Bio-Intelligence Age". One of its primary features is that medical science crosses traditional disciplines, transecting the biological sciences, physical sciences (engineering), and information sciences. Orthopaedics has stepped forward with new technologies, biologics, surgical and educational approaches. New technologies include new levels of precision offered by digital medical technology, robotic surgery, (eg. the acrobat for knee arthroplasty), and artificial intelligence. New biologics have spanned from gene therapy and biodgradable implants to state-of-the-art tissue-engineering of musculoskeletal tissues. Orthopaedics in age of bio-intelligence has embraced new surgical approaches including intrauterine surgery and composite tissue allotransplantation. Of course, these new technologies, biologics and surgical approaches come with new educational demands. Today, efforts focus on skills and simulation training with assessment of cognitive and technical skills. It appears that *"biotechnology will dominate our lives during the next fifty years, as much as the domestication of computers has for the last 50 years"* Dyson.

THROMBOELASTOGRAPHIC PHENOTYPES OF FIBRINOGEN AND ITS VARIANTS: CLINICAL AND NON-CLINICAL IMPLICATIONS

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Thromboelastography (TEG), a widely used clinical point of care coagulation test, is poorly understood. To investigate its fibrin determinants, we used normal and variant fibrinogen isolates. We focused mainly on the TEG maximum signal amplitude (MA), a shear modulus and clot stiffness indicator. Isolates included normal des-αC, cord, and abnormal congenital variants with amino acid substitutions or deletions that impaired fibrin polymerization. Heterophenotypic congenital isolates were from cryoprecipitate-depleted plasma owing to their more diminished clot MA than their cryoprecipitate counterparts. By colorimetric assay, the amount of fibrinogen adsorbed by untreated TEG cups was 83.5±12.4 pM/cm(2), n=18. Thrombin-induced clots were obtained at pH6.4 or 7.4, the latter containing 8mM CaCl2, and 14% afibrinogenemic plasma with and without gel-sieved platelets. Measured by the water droplet contact angle, >90% reduction of surface hydrophobicity by exposure of TEG cup and pin to ozone plasma decreased MA by 74%. Increasing normal fibrinogen or thrombin concentrations progressively increased MA. Platelets increased MA further ~2 fold, except for ≥10 fold for des-αC clots. Examined in the absence of platelets, MA of heterophenotypic fibrin variants averaged 21%, n=15. The results imply that essential MA determinants include hydrophobic fibrinogen/fibrin adsorption and each polymerization contact site, with substantial enhancement by platelets. Also, cryoprecipitate-harvested soluble fibrinogen/fibrin complexes contained mostly normal molecules, while cryoprecipitate-depleted plasma contained mostly variant molecules. Moreover, significantly decreased MA by fibrinogen anomalies and/or low level thrombin generation can potentially impact clinical interpretation of MA.

DETERMINATION OF THE CHOLESTEROL COMPOSITION WITH PHYSICOCHEMICAL ANALYSIS

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Cholesterol samples from surgical patients were analysed with XRD, XRF and FTIR for density determination and melting point in the laboratory of Mineralogy-Petrology and Ore deposits at the NTUA University of Athens.

The analysed samples are classified into four major groups depending on their chemical constituents and their color.

a) Cholesterolstones with more than 80% cholesterol are mostly white in color or light white.
b) Mixed colored stones consist of a varying amount of cholesterol probably lower than 80% and bilirubinate salts.
c) Pigment stones are subdivided into brown or black pigment stones. Both consist of various bilirubinate salts with less than 30%cholesterol.
d) Stones with high content of calcium carbonate.

Oleg Klineretal mention, that depending on the color, the gallstones can be distinguished into a similar chemism. For example, white colored gallstones consist mainly of cholesterol, black colored are rich in bilirubin and brown colored stones are composed of variable bilirubin and cholesterol levels.

The main minerals of human gallstones are big or small crystals of cholesterol and bilirubin in various bilirubinate salts.

Other components that have been detected with gallstones are calcium carbonate (calcium palmitate), calcium oxalate, calcium phosphate, various cholic acid and some proteins.
The FTIR cholesterol bands are attributable at 3398, 2933, 2866, 1463, 1376 and 1053 cm^{-1}, various bilirubinate were observed in the region 1661, 1626, 1570 cm^{-1}. The characteristic bands of calcium carbonate are in the 1850 and 2920 cm^{-1} region.
Identified elements with XRF are: Ca (1,5-1,9%) and in lower concentration (ppm) K, Fe, Cl, P, S and Ti. Other publications (Athanasiou et al) identified the elements Ca, Fe, Mn, Cu, Zn, Ni, Pb and As.
The melting point of the analysed gallstones varies between 144-152,1 °C.
The density varies between 0,37-0,48 g/cm^3 and is much lower than the density of chylomicrons (0.94 g/cm^3).That means that the analysed samples are mixed with human tissues.
Various diseases of the liver like hepatitis are clogging of the bile ducts through formation of stones lead to an abnormal gathering of bile.

MUSEUM OF THE SCHOOL OF DENTISTRY

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The Museum of Dentistry at the Dental School of the National and Kapodistrian University of Athens was established in 2012. The main exhibition area of the Museum is located on the first floor of the new building of the Dental School in Goudi. There is a large selection of exhibits which are continuously enriched by contributions from institutions and individuals. The collection includes instruments, devices, materials and complete dental units used in dentistry, reflecting not only the history of the Athens School of Dentistry and dentistry in Greece, but also the historical evolution of dentistry on a global level. For example, dental drills, surgical instruments such as dental forceps and levers, operative dentistry devices, the first airotor contra-angle hand piece that was used at the operative dentistry dpt., amalgam dispensers, and tools and devices of prosthetic dentistry (e.g. porcelain teeth, impression trays, vulcanizing device for the manufacturing of dentures), various types of dental headpieces and a rare dental unit with an even most rarer dental office light.
One of the most striking exhibits is a portable wooden cabinet with materials and tools for exercising the dental art, which inter alia contains a significant number of glass vials with pharmaceutical preparations for dental use, a great collection of hand tools for placing materials, endodontics tools, needles, syringes, intact local anesthetic vials, etc.
The Museum incorporates the historical archive of Athens Dental School and supports the research the archive. The rare archival footage tracks the evolution of the *"Οδοντοϊατρικόν Σχολεῖον"* (Dental School) from the very early steps of establishment in 1916 until the early 1980s.
The documents illustrate the way in which the first University Dental educational institution was formed, as well as the changes over the years. At the same time, unknown aspects of Athens University academic activity are illuminated.
The museum's photographic collection comprises of digitized archival material, such as case laws, statutes, proceedings excerpts of the "Iatrosynedrio" (early version of the National Medical Council), the University, the School of Medicine and the School of Dentistry, as well as general material relating to the evolution of dental theory and practice.
The Dental Department Museum utilizing the advantages of modern Internet and Multimedia Technology developed a Digital Museum (www.museum.dent.uoa.gr). The purpose was not only to present the exhibits but also to feature the history of Dental Education and Practice in Greece through time. In the digital crossroads of Contemporary Technology and Dental History, individualized action is allowed based on digital storytelling. Thus, the website visitor can wander around and study the entire dental legislation since the establishment of the Modern Greek State until our days.
One of the most ambitious programs that are running at the moment is the creation of open, freely accessible online library for the specialist, the student, the scholar, everyone. Rich material about the Museum and Dentistry will be offered in electronic form. Already, the Museum has undertaken the digitization of all English dental books which are copyright free. The website also presents the teaching staff, wishing to pay homage to all those who contributed to the upgrading of dental education in our area. In addition, a special section is devoted to all doctorates of Dental School of Athens. Currently, an effort is in progress, so that all the graduates will be recorded, from the first one who graduated in 1916 to the present day.
Our goals for the Museum of Dentistry are to not have it be a static memorial exhibition space but a living educational environment, a cradle for research and culture accessible to all; to have it contribute to the study and promotion of the History of Dentistry, in general, and that of the School of Dentistry, specifically.
The Museum of Dentistry supports a remarkable number of research projects. A monograph on "Dentistry in the Ancient Greek World" has been issued already. Another study about the role of "Iatrosynedrion" (medical council) in the support of the dental profession and the promotion of dental education in Greece is already at the stage of final writing.
Educational programs have been designed for schoolchildren, both for primary and secondary education. The capability of the Museum of Dentistry to plan and realize innovative educational programs has begun to bear fruit and also to gain distinction.