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Contents: Overview of Treatment Wetlands; Fundamentals of Treatment Wetlands; Horizontal Flow Wetlands; Vertical Flow Wetlands; French Vertical Flow Wetlands; Intensified and Modified Wetlands; Free Water Surface Wetlands; Other Applications; Additional Aspects.

Water Quality – Science, Assessments and Policy examines many of the scientific issues; national, regional and local assessment practices and results; and national policy issues related to water quality. Chapters focus on three areas: water quality parameters, water quality treatments, and water quality assessments. This book provides a basic understanding of water quality issues and practical examples of their solution.

Antimicrobial resistance is arguably the greatest threat to worldwide human health. This book evaluates the roles of human water use, treatment and conservation in the development and spread of antimicrobial resistance. Designed as a companion volume to Antimicrobial Resistance in the Environment (Wiley-Blackwell, 2012), this book is a multi-disciplinary synthesis of topics related to antimicrobial resistance and wastewater treatment processes. Antimicrobial Resistance in Wastewater Treatment Processes assembles detailed discussions written by many of the world's best-known experts in microbiology, civil engineering, chemistry, environmental science, public health and related fields. The book presents a collection of subjects that includes: Current knowledge of the role of the environment in development and spread of antimicrobial resistance Chemical analysis of antibiotics in environmental samples Molecular methods for analysis of antimicrobial resistance genes Advanced wastewater treatment processes and antimicrobial resistance effects Public perception of risk related to health consequences of antimicrobial resistance Public health implications of antimicrobial resistance with focus on wastewater treatment processes Antimicrobial resistance has gained a foothold in the global consciousness as a serious public health threat. There is a much greater appreciation for the role of the environment in the dissemination of antimicrobial resistance and the effects of pollutants that can potentially promote development of resistance in bacteria. Contaminants released from wastewater treatment plants are a concern. In Antimicrobial Resistance in Wastewater Treatment Processes, readers will be guided through examinations of the current science related to this important health issue.

This volume provides a broad overview of the latest achievements in scintillator development, from theory to applications, and aiming for a deeper understanding of fundamental processes, as well as the discovery and availability of components for the production of new generations of scintillation materials. It includes papers on the microtheory of scintillation and the initial phase of luminescence development, applications of the various materials, and development and characterization of ionizing radiation detection equipment. The book also touches upon the increased demand for cryogenic scintillators, the renaissance of garnet materials for scintillator applications, nano-structuring in scintillator development, development and applications for security, and exploration of hydrocarbons and ecological monitoring.

Table olives are a traditional fermented vegetable with many centuries of history, particularly in the Mediterranean basin, where this food has had a great influence on the culture and diet of many countries. Moreover, this fermented food is prepared with fruits obtained from cultivated *Olea europaea* subsp. *europaea* var. *europaea* trees and has been expanded for many countries all over the world. At present, the table olive is one of the major fermented vegetables, with an overall production above 2,500,000 tons/year. Thus, the table olive industry is increasingly demanding new biotechnological approaches, sensory characteristics and differentiation of the products. So scientists have to focus on solving problems and providing new tools in this fermented food process. In recent years, there is an increased interest in different nutritional and microbial aspects related to table olives. During the last five years, new fields have been implemented or developed, such as new probiotic strains to produce an enriched product, study of pathogen survival, NaCl content reduction, microbial resistant to stress conditions, microbial biofilms, predictive microbiology, use of NGS and metagenomics, use of bioactive compounds derived from table olive processing and the treatment of effluents generated during olive processing. The diversity of research displayed in this Research Topic demonstrates the important potential of this product and its impact on the fermented vegetables economy.

The three-volume set LNCS 10860, 10861 and 10862 constitutes the proceedings of the 18th International Conference on Computational Science, ICCS 2018, held in Wuxi, China, in June 2018. The total of 155 full and 66 short papers presented in this book set was carefully reviewed and selected from 404 submissions. The papers were organized in topical sections named: Part I: ICCS Main Track Part II: Track of Advances in High-Performance Computational Earth Sciences: Applications and Frameworks; Track of Agent-Based Simulations, Adaptive Algorithms and Solvers; Track of Applications of Matrix Methods in Artificial Intelligence and Machine Learning; Track of Architecture, Languages, Compilation and Hardware Support for Emerging Manycore Systems; Track of Biomedical and Bioinformatics Challenges for Computer Science; Track of Computational Finance and Business Intelligence; Track of Computational Optimization, Modelling and Simulation; Track of Data, Modeling, and Computation in IoT and Smart Systems; Track of Data-Driven Computational Sciences; Track of Mathematical-Methods-and-Algorithms for Extreme Scale; Track of Multiscale Modelling and Simulation Part III: Track of Simulations of Flow and Transport: Modeling, Algorithms and Computation; Track of Solving Problems with Uncertainties; Track of Teaching Computational Science; Poster Papers

• Pour chaque volume, les épreuves corrigées 2015, 2016 & 2017 • Des corrigés enrichis de commentaires comportant : des points méthodes, des rappels de cours, des remarques sur les questions, des conseils de rédaction, des remarques issus des rapports de jurys, etc. • D'authentiques copies d'étudiants annotées qui accompagnent certains de ces corrigés commentés.

Hazardous pollutants are a growing concern in treatment engineering. In the past, biological treatment was mainly used for the removal of bulk organic matter and the nutrients nitrogen and phosphorous. However, relatively recently the issue of hazardous pollutants, which are present at very low concentrations in wastewaters and waters but are very harmful to both ecosystems and humans, is becoming increasingly important. Today, treatment of hazardous pollutants in the water environment becomes a challenge as the water quality standards become stricter. Hazardous Pollutants in Biological Treatment Systems focuses entirely on hazardous pollutants in biological treatment and gives an elaborate insight into their fate and effects during biological treatment of wastewater and water. Currently, in commercial and industrial products and processes, thousands of chemicals are used that reach water. Many of those chemicals are carcinogens, mutagens, endocrine disruptors and toxicants. Therefore, water containing hazardous pollutants should be treated before discharged to the environment or consumed by humans. This book first addresses the characteristics, occurrence and origin of hazardous organic and inorganic pollutants. Then, it concentrates on the fate and effects of these pollutants in biological wastewater and drinking water treatment units. It also provides details about analysis of hazardous pollutants, experimental methodologies, computational tools used to assist experiments, evaluation of experimental data and examination of microbial ecology by molecular microbiology and genetic tools. Hazardous Pollutants in Biological Treatment Systems is an essential resource to the researcher or the practitioner who is already involved with hazardous pollutants and biological processes or intending to do so. The text will also be useful for professionals working in the field of water and wastewater treatment.

Inégalités de développement humain constituent une entrave à la réalisation du Programme de développement durable à l'horizon 2030. Elles ne se résument pas à des écarts de revenus et de richesses, et l'on ne peut en rendre compte au moyen de simples indicateurs synthétiques unidimensionnels. Elles détermineront aussi les perspectives de ceux et celles qui seront peut-être encore vivants au XXIIe siècle. Le Rapport étudie les inégalités de développement humain en allant au-delà des revenus, des moyennes et du temps présent. Il s'interroge sur les formes d'inégalités qui comptent et leurs moteurs, reconnaissant que les inégalités pernicieuses sont généralement mieux perçues comme un symptôme de problèmes d'une plus grande ampleur dans une société ou une économie. Il cherche également à déterminer quelles politiques sont susceptibles de s'attaquer à ces moteurs – des politiques qui peuvent aider les pays à faire avancer leur économie tout en améliorant le développement humain et en réduisant les inégalités.

Today, microbiology is a rapidly growing discipline in the life sciences, and the technologies are evolving on a virtually daily basis. Next-generation sequencing technologies have revolutionized microbial analysis, and can help us understand the biology and genomic diversity of various bacterial species with significant impacts on agro-ecosystems. In addition, advances in molecular biology and microbiology techniques hold the potential to improve the productivity and sustainability of agriculture and forestry. This new volume addresses the role of microbial genomics in understanding the living systems that exist in the soil and their interactions with plants, an aspect that is also important for crop improvement. The topics covered focus on a deeper and clearer understanding of how microbes cause diseases, the genome-based development of novel antibacterial agents and vaccines, and the role of microbial genomics in crop improvement and agroforestry. Given its scope, the book offers a valuable resource for researchers and students of agriculture and infectious biology.

This book is devoted to scholarship in the field of self-directed learning in the 21st century, with specific reference to higher education. The target audience of the book includes scholars in the field of self-directed learning and higher education. The book contributes to the discourse on the quality of education in the 21st century and adds to the body of scholarship in terms of self-directed learning, and specifically its role in higher education. Although all the chapters in the book directly address self-directed learning, the different foci and viewpoints raised make the book a rich knowledge bank of work on self-directed learning.

"European jihadism is a multi-faceted social phenomenon. It is not only linked to the extremist behaviour of a limited group, but also to a broader crisis, including the lack of utopia and loss of meaning among the middle classes, and the humiliation and denial of citizenship among disaffiliated young people in poor districts all over Western Europe. Fundamentally, it is grounded IN AN UNBRIDLED AND MODERN IMAGINATION, IN AN UNEASY RELATIONSHIP WITH SOCIAL, CULTURAL, AND ECONOMIC REALITY. THAT IMAGINATION IS DESCRIBED IN THIS BOOK AMONG YOUNG WOMEN AND THEIR LONGING FOR ANOTHER FAMILY MODEL, ADOLESCENTS AND THEIR DESIRE TO BECOME ADULTS AND TO OVERCOME THE FAMILY CRISIS, PEOPLE WITH MENTAL PROBLEMS FOR WHOM JIHAD WAS A CATHARSIS, YOUNG CONVERTS WHO SOUGHT TO REALIZE THEIR DREAM OF A DIFFERENT RELIGION, IN CONTRAST WITH A DISENCHANTED SECULAR EUROPE. The family and its crisis, in many ways, played a role in promoting jihadism, particularly in families of immigrant origin whose relationship to patriarchy was different from that of the mainstream society in Europe. Among middle class families, the crisis of authority was a key factor for the departure of middle-class youth. At the urban level, a large proportion of jihadists come from poor and ethnically segregated districts with high levels of social deviance and the stigma attached to them. Within these poor districts, a specific subculture was built up (we call it the Slum Culture), which influenced young people and imposed on them a lifestyle likely to combine resentment and deviance with humiliation and denial of citizenship in a difficult relationship with mainstream society. BUT JIHADISM WAS ALSO AN EXPRESSION OF THE LOSS OF HOPE IN THE FUTURE IN A GLOBALIZED WORLD AMONG MIDDLE CLASS AND LOWER-CLASS YOUTH. THE CALIPHATE IN SYRIA PROMISED THE EARTH TO THESE YOUNG PEOPLE DURING ITS ASCENT BETWEEN 2014-2015 AND EVEN AFTER, THIS TIME AS A PROPHET OF A GLOOMY END TIMES"--

Rainfall infiltration is an important component of the hydrologic cycle and plays a crucial role in the formation of surface runoff, providing subsurface water that governs the water supply for agriculture, the transport of pollutants through the vadose zone, and the recharge of aquifers. The spatiotemporal evolution of the infiltration rate under natural conditions cannot currently be deduced by direct measurements at any scale of interest. Therefore, the use of infiltration modeling is of fundamental importance in applied hydrology and allows this process to be described through measurable quantities. In spite of the continuous development of infiltration modeling in recent decades, the estimation of infiltration at different spatial scales, i.e., from the local to watershed scales, remains a complex problem because of the natural spatial variability of both soil hydraulic characteristics and rainfall. For many years, research activity has been limited to the development of local or point infiltration models for vertically homogeneous soils with flat surfaces. Recent scientific literature has extended infiltration modeling to many other involved elements whose representation, however, still represents an open problem. In this context, this volume attempts to make a contribution to the modeling of point infiltration into vertically non-uniform soils or soils modified by human activities, infiltration over horizontal heterogeneous areas, infiltration into soil surfaces with significant slopes, interaction between the infiltration process and the groundwater system, and infiltration due to irrigation and the surface water-groundwater dynamics.

The indiscriminate use of medications and their inadequate disposal have resulted in them being released into the environment via municipal, hospital and industrial discharges. This volume critically examines the presence of pharmaceuticals in aquatic ecosystems, the hazards they entail, and how to minimize their impact on the environment. The topics covered include: historical findings that have made the development of the discipline ecopharmacovigilance possible; the main exposure routes, fate and life cycle of pharmaceuticals in water; occurrence data and the impact on biodiversity; methods used for the detection, analysis and quantification of pharmaceuticals in water and for their removal; current legislation on the presence of emerging contaminants in water; biosensors for environmental analysis and monitoring; and the measures needed to reduce the existing problems. This book is aimed at students, academics and research workers in the fields of toxicology, ecology, microbiology and chemistry, as

rivers and lakes, in freshwater biota, and hazardous chemicals associated with microplastics in such systems. Another set of chapters discuss the presence of microplastics in wastewater: their sources; their transfer through a wastewater treatment plant; the concentration of microplastics in effluents throughout the world; the plastic biomedica used in wastewater treatment plants and the effect on the surrounding environment of effluent wastewater pipes. These chapters also discuss the sampling methods, the sample treatment and analysis techniques used so far for microplastics in wastewater. Additionally, the presence of microplastics in sewage sludge and in soils irrigated with wastewater or fertilized with sludge are discussed. The possible impact of plastics and their additives on plants, microalgae, and humans are reviewed and presented in a critical way. Finally, a chapter summarizes all the relevant regulations and initiatives that point to the necessity of a global directive for the protection of the environment from plastic and microplastic pollution. The topic of microplastics in freshwater systems and in wastewater has scarcely been studied and requires more attention. *Microplastics in Water and Wastewater* aims to bring these initial findings to the attention of a broader audience and especially to operators and managers of freshwater and wastewater systems. It will also be helpful to people already aware of the marine debris problem to understand the sources of microplastics in the oceans, from freshwater systems and wastewater treatment plants.

The four Nordic cities included in the present study form a gradient both in climate, from oceanographic temperate in Tórshavn at 62°N to arctic in Tromsø at 69.70°N, and in population, from less than 6000 inhabitants in Sisimiut to close to 120 000 in Reykjavík. The cities are different and far apart but products from the sea has been mainstay to the economy and societal development. Thus, the management of sewage from the municipalities must maintain a clean and healthy marine environment. The wastewater treatment varies, from screening on fine mesh, via septic tank based purification solutions, to no purification at all. We measured the contaminants in wastewater streams and in recipient samples, and with that in hand assessed whether the wastewater treatment appeared sufficient, and if not, which mitigating solutions could be relevant for wastewater purification optimisation.

Phenolic compounds as a large class of metabolites found in plants have attracted attention since long time ago due to their properties and the hope that they will show beneficial health effects when taken as dietary supplements. This book presents the state of the art of some of the natural sources of phenolic compounds, for example, medicinal plants, grapes or blue maize, as well as the modern methods of extraction, quantification, and identification, and there is a special section discussing the treatment, removal, and degradation of phenols, an important issue in those phenols derived from the pharmaceutical or petrochemical industries.

Truly high altitude aquatic ecosystems are found primarily at lower latitudes: vast regions in the tropical part of the Andes, the Himalayas and Tibet, considerable areas in East Africa, and minor zones of Oceania. However, despite their abundance in these regions, their biology and ecology has never been summarized in detail. A current synthesis of the topic is therefore timely. High altitude waters are ideal systems with which to address a broad range of key and topical themes in ecology, both at the regional and global scales. From specific functional adaptations of aquatic species to harsh environmental conditions through to global diversity patterns along altitudinal gradients and extinction risks of mountain populations due to vanishing glaciers, ecological patterns and processes found in high altitude waters are both diverse and singular. Although poorly considered in classical textbooks of ecology and limnology, high altitude waters have much to offer existing (aquatic) ecological theories and applications. These often threatened and exploited habitats are also ideal for studying the intimate interactions between social and ecological systems that characterize the majority of ecosystems in the Anthropocene.

This book presents the select proceedings of the International Conference on Sustainable Practices and Innovations in Civil Engineering (SPICE 2019). The chapters discuss emerging and current research in sustainability in different areas of civil engineering, which aim to provide solutions to sustainable development. The contents are broadly divided into the following six categories: (i) structural systems, (ii) environment and water resource systems, (iii) construction technologies, (iv) geotechnical systems, (v) innovative building materials, and (vi) transportation. This book will be of potential interest for students, researchers, and practitioners working in sustainable civil engineering related fields.

This book presents selected research papers from CISC'17, held in Mudanjiang, China. The topics covered include Multi-agent system, Evolutionary Computation, Artificial Intelligence, Complex systems, Computation intelligence and soft computing, Intelligent control, Advanced control technology, Robotics and applications, Intelligent information processing, Iterative learning control, Machine Learning, and etc. Engineers and researchers from academia, industry, and government can gain valuable insights into solutions combining ideas from multiple disciplines in the field of intelligent systems.

Title 40 Protection of Environment - Parts 136 to 149

Micropollutants in wastewater in four arctic cities- is the treatment sufficient? Nordic Council of Ministers

These proceedings collect the papers presented at the 30th International Symposium on Shock Waves (ISSW30), which was held in Tel-Aviv Israel from July 19 to July 24, 2015. The Symposium was organized by Ortra Ltd. The ISSW30 focused on the state of knowledge of the following areas: Nozzle Flow, Supersonic and Hypersonic Flows with Shocks, Supersonic Jets, Chemical Kinetics, Chemical Reacting Flows, Detonation, Combustion, Ignition, Shock Wave Reflection and Interaction, Shock Wave Interaction with Obstacles, Shock Wave Interaction with Porous Media, Shock Wave Interaction with Granular Media, Shock Wave Interaction with Dusty Media, Plasma, Magnetohydrodynamics, Re-entry to Earth Atmosphere, Shock Waves in Rarefied Gases, Shock Waves in Condensed Matter (Solids and Liquids), Shock Waves in Dense Gases, Shock Wave Focusing, Richtmyer-Meshkov Instability, Shock Boundary Layer Interaction, Multiphase Flow, Blast Waves, Facilities, Flow Visualization, and Numerical Methods. The two volumes serve as a reference for the participants of the ISSW30 and anyone interested in these fields.

This book includes high-quality papers presented at International Conference on Scientific and Natural Computing (SNC 2021), organized by Department of Applied Mathematics, Gautam Buddha University, Greater Noida in collaboration with IIT Roorkee and Technical University of Ostrava (VSB-TU) and technically sponsored by Soft Computing Research Society of India, held online during 5 – 6 February 2021. The topics include self-organizing migrating algorithm, genetic algorithms, swarm intelligence based techniques, evolutionary computing, fuzzy computing, probabilistic computing, genetic programming, particle swarm optimization, neuro computing, hybrid methods, deep learning, including convolutional neural networks, generative adversarial networks and auto-encoders, bio-inspired systems, data mining, data visualization, intelligent agents, engineering design optimization, multi-objective optimization, fault diagnosis, decision support, robotics, signal or image processing, system identification and modelling, systems integration, time series prediction, virtual reality, vision or pattern recognition, intelligent information retrieval, motion control and power electronics, Internet of Everything (IoE), control systems, and

supply chain management.

In the developing countries, pollution through solid waste, sludge from water and wastewater treatment plants and pollution of natural water resources have become one of the grave issues. The root cause is population explosion, industrialization, urbanization and other anthropogenic activities. The increase rate of solid waste has become a major challenge for sustainable development of the environment. Poor management of solid waste and sludge from water and wastewater treatment plants may be the cause of health hazards and environmental problems. The book presents new methods and technologies to combat the aforementioned problems and focuses on the importance of using the recycled products. The technologies related to waste and sludge treatment are economical, eco-friendly and bring economic returns, and can be applied to most of the developing countries where waste treatment technologies, viz. composting, anaerobic digestion, recycling of plastic and agricultural waste in construction can be used. The aim of the book is to support everyone who is involved in academics, teaching, research related to solid waste management and water and wastewater treatment study in the leading academic and research organizations globally. This book will be of prodigious value to upcoming researchers, scholars, scientists and professionals in Environmental Science and Engineering fields, and global and local authorities and policy makers responsible for the management of solid wastes and sludge. Globally, universities can develop new prospectuses on sustainable and eco-friendly waste and sludge management, which are relating to the book's theme. This book can also be of great source for designing and operation of waste reuse and recycling programmes.

Advanced Oxidation Processes (AOPs) rely on the efficient generation of reactive radical species and are increasingly attractive options for water remediation from a wide variety of organic micropollutants of human health and/or environmental concern. Advanced Oxidation Processes for Water Treatment covers the key advanced oxidation processes developed for chemical contaminant destruction in polluted water sources, some of which have been implemented successfully at water treatment plants around the world. The book is structured in two sections; the first part is dedicated to the most relevant AOPs, whereas the topics covered in the second section include the photochemistry of chemical contaminants in the aquatic environment, advanced water treatment for water reuse, implementation of advanced treatment processes for drinking water production at a state-of-the art water treatment plant in Europe, advanced treatment of municipal and industrial wastewater, and green technologies for water remediation. The advanced oxidation processes discussed in the book cover the following aspects: - Process principles including the most recent scientific findings and interpretation. - Classes of compounds suitable to AOP treatment and examples of reaction mechanisms. - Chemical and photochemical degradation kinetics and modelling. - Water quality impact on process performance and practical considerations on process parameter selection criteria. - Process limitations and byproduct formation and strategies to mitigate any potential adverse effects on the treated water quality. - AOP equipment design and economics considerations. - Research studies and outcomes. - Case studies relevant to process implementation to water treatment. - Commercial applications. - Future research needs. Advanced Oxidation Processes for Water Treatment presents the most recent scientific and technological achievements in process understanding and implementation, and addresses to anyone interested in water remediation, including water industry professionals, consulting engineers, regulators, academics, students. Editor: Mihaela I. Stefan - Trojan Technologies - Canada

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