

### Chapter 1 : European Alternatives Is Europe too Social?\* - European Alternatives

*Draxler, J. () 'Towards a post-communist welfare state?' in: The State of European Integration, © BY JURAJ DRAXLER. PROUDLY CREATED WITH calendrierdelascience.com*

The maintenance of cellular activity requires energy. That energy is stored in the chemical bonds of a molecule, adenosine triphosphate: ATP is primarily made in small structures within cells, the mitochondria. Under potentially lethal conditions, such as hypoxia or ischemia, the potential falls, and the enzyme reverts from ATP synthesis to ATP hydrolysis. It binds to the ATPase and limits its hydrolytic activity, protecting the cell from mitochondrial driven ATP depletion, and therefore represents an important determinant for cell survival. We have measured its expression in various tissues in relation to the F1-F0 ATP synthase and imaged its intracellular localization. We have also genetically manipulated the expression levels of the protein to determine its role in the cellular response to hypoxia. To this end, we have devised and built an instrument to explore the relationships between ATP measured with firefly luciferase luminescence and other aspects of mitochondrial and cell patho physiology – mitochondrial potential, redox state, calcium and pH, measured using fluorescence indicators. This instrument, Fluminometer or Fluoro-luminometer combines measurements of fluorescence and luminescence signals aiming to extend our knowledge of the relationships between changes in cellular pathophysiology and ATP homeostasis in intact cells. The light management in present liquid crystal displays LCDs is not very efficient. One of the factors limiting the light throughput is the absorption in the colour filters. It has been shown[1] that a promising way to reduce this absorption is the use of diffractive colour separation by a grating on top of a lightguide in the backlight. Recently it has been shown[2] that it is possible to combine colour separation with polarised light emission by the use of a surface-relief grating with a birefringent coating. In that way also the absorption in the polarisers can be reduced. The principle of this colour-separating polarised backlight is as follows. A surface-relief grating with a period of approximately nm is applied onto a lightguide. The grooves of the grating are filled with a birefringent material having its optical axis along the grooves. Furthermore, the ordinary refractive index of the birefringent material is matched to the grating material, whereas its extraordinary refractive index is significantly higher. As a result, light with polarisation along the grooves s-polarised light can be diffracted, whereas light with polarisation perpendicular to the grooves p-polarised light will propagate unaffectedly in the lightguide due to total internal reflection. The structures used up to now showed the feasibility of our concept but were not yet optimised. We performed calculations of the grating efficiency as a function of the material and structure parameters. For high efficiencies of the colour-separating polarised backlight, the extraordinary index of the birefringent material should be high. The modulation depth of the grating is preferentially between and nm. The grating efficiency is affected by the shape of the grating as well. In order to obtain the desired grating structures the interference pattern produced by two laser beams coming from the same source has been used to induce an anisotropic polymerisation process in photosensitive materials. An etching procedure can be applied thereafter to realize the surface relief morphologies. We will show a first optical characterization of the obtained structures that evidences their novel features. Displays; Backlights; Holography; Diffraction Gratings; Colour-separation Young stars and active galaxies in the laboratory: Recent developments in experimental plasma physics have led to the opportunity of re-creating in the laboratory the physical conditions and phenomena that take place in some of the most extreme astrophysical environments. These encompass a wide range of astrophysical objects and phenomena, such as supernovae explosions, radiatively driven molecular clouds and the environment around neutron stars. Advancement in high-performance computer simulations has also been fundamental for the understanding of the possible connections between the laboratory experiments, the astrophysical observations and the theoretical models. In the present talk I will review some of the most relevant laboratory astrophysics results obtained in recent years, and present our latest efforts in modelling in the laboratory the jets and flows that are observed, for

example, in newly born stars and accreting black-holes. Laboratory astrophysics; Plasma physics; Numerical modelling; Jets and outflows Development of a co-culture system for tissue engineered vascular grafts Claire M. Surgical replacement or bypass surgery is the most common treatment for coronary and peripheral atherosclerotic diseases, with over 28, bypass cases performed each year in the UK. However, many patients do not have appropriate blood vessels for use as replacements and the development of tissue engineered vascular grafts TEVG offers a possible solution to this problem. Smooth muscle cells SMC and endothelial cells EC exist within close proximity to each other within the blood vessel interacting in a variety of ways which can regulate the normal function of both cell types. As such establishing a stable co-culture system is vital for the development of a TEVG. For a TEVG to be fully functional it must be able to withstand the variety of mechanical stresses present in the dynamic vascular environment. These physical cues also provide signals to both the SMC and EC, regulating the development of the vessel. The mechanical stresses in vivo are extremely complex, but can be approximated by use of a bioreactor system. The main aim of this research is to develop a tubular co-culture system of SMC and EC that can be used within a coronary artery bioreactor system. In order to achieve this goal, a well-established 2D porous membrane system was initially developed, which established that co-culture with our cell types was possible. Growth curves have been carried out to determine a media suitable for both cell types, and SMC and EC markers are being assessed by RNA analysis and immunocytochemistry. Based on this work a system of direct co-culture is being developed and assessed for its suitability for use within the bioreactor system. Vascular; Co-culture; Tissue engineering; Smooth muscle cell; Endothelial cell Simulation in cardiovascular dynamics: Lumped parameter models as a complement for 3D refined modelling Vanessa A. Studies of the cardiovascular system require a multidisciplinary approach, bringing together expertise from a number of branches of experimental and theoretical science. Interdisciplinary teams provide the key to answering questions concerning the diverse forms of biological interaction amongst individual organs, between these organs and their environment and their reactions under physiological conditions or specific inputs. Modelling of biological systems represents a challenge and the use of complex 3D physiological models remains at the frontier of what can be currently achieved with specialized software. The use of finite elements FE models to represent the whole system is computationally prohibitive and a multiscale approach is an attractive alternative. Detailed FE models can be used where accuracy is needed. These can then be coupled to more global lumped models of the rest of the system. Significant resource has been directed to the use of FE modelling but less to advanced lumped modelling. Quite simple approaches for the lumped parts e. This may limit the usefulness of these models. In this work, a simple model of the left ventricle will be presented. The energetically coherent approach used aids understanding of the dynamics of the left ventricle. Whilst the model is too simple to be used in clinical diagnosis, it can provide adequate boundary conditions for FE models of the arterial system. The natural extension of this work is the core of the Marie-Curie funded project C-CAReS, in which a coupling of a simple ventricular Bond Graph model with a 3D model of the aortic valve is being developed. The ultimate goal is to determine the closure force of an aortic valve as a function of patient physiology. Cardiovascular modelling and simulation; 3D models; Lumped parameter models; Boundary conditions Eastern Europe: This paper surveys a certain paradox of the Eastern European welfare state. Four of the eight post-communist countries that have recently become EU members have flat-rate income taxation. Attempts at privatising healthcare are widespread. With weak unions and infrequent industrial actions and not many institutional labour market rigidities such as occupational pensions , few Western European structural problems trouble policy-makers in the East. On the other hand, the post-communist economies rely dominantly on the growth based on traditional industrial operations, plants based on economies of scale and massified workforce. This is driven by foreign direct investment FDI. Not much of a middle class is being created with existing income patterns and some policy changes flat rate personal income tax even seem to be aiding a retardation. The post-communist states seem to be depriving themselves of the means welfare state and taxation mechanisms to invest in the knowledge economy and create a vibrant middle class! With more music content available

through digital means e. To accomplish this, a better understanding of individual differences in music preferences is necessary. P2P and Grid computing are two technologies used to respond to users needs and distributed application requirements. The former focus is on resource sharing, such as Gnutella, etc. One of the features of these systems is that the resources are gathered dynamically due to their availability and services they can provide. The later attention is in computing resources and system performance. Usually the system resources are booked in advance. The challenge here is to design and implement techniques for efficient management and utilisation of all system resources. In this paper, we will focus on how to design efficient search and discovery techniques to optimise the system response time? We use techniques based on structured network topology. Therefore, we propose a new self-reconfigurable network topology, called TreeP. We conducted both theoretical and experimental studies of TreeP. The TreeP system is then stressed in real-world heterogeneous computing environment and proved to be very efficient.

### Chapter 2 : The State of European Integration : Ioannis Stivachtis :

*In particular, it draws attention to pension systems as a particularly sizeable component of the welfare state to illustrate how far most of the post-communist EU members diverge in terms of the.*

The study argues that globalisation is much more the Directorate-General for Employment, Social and Equal Opportunities of the European Commission. Yet, the benefits of globalisation cannot be assumed to happen, and with an increased pace of change it is inevitable that there will be which had broad attendance by officials, media people losers as well as winners, with marked social and researchers, and was concluded by a keynote consequences. The conference took place at a time of and the European social model is not emerging financial crisis and rising oil and food prices, doomed aspects emphasised by some speakers as elements 2. The European social model is not doomed far throwing new light on some of the arguments in the from it and the idea that only free market report. Indeed, the success of the smaller innovation constitutes an important condition for open economies testifies to the scope for enhancing the competitiveness of the European prospering, even with extensive and generous economy. Thus, the Union should take on a leadership welfare states. The principal benefits of globalisation stem from stability. Barroso, in his conclusions underlined the the scope it affords on the supply side for increased necessity of a renewal of social policies based on equal specialisation, enhanced diffusion of technology opportunities, access and solidarity. Consumers gain from lower prices and increased choice, while an often overlooked benefit on the demand side is that emerging markets offer rapidly growing sales 2 Videos of the conference proceedings, speeches and opportunities for European companies. CEPS Policy Briefs present concise, policy-oriented analyses of topical issues in European affairs, with the aim of interjecting the views of CEPS researchers and associates into the policy-making process in a timely fashion. Unless otherwise indicated, the views expressed are attributable only to the authors in a personal capacity and not to any institution with which they are associated. Available for free downloading from the CEPS website <http://www.ceps.europa.eu> It also encompasses cultural convergence and other 4. It has also to be repeated that globalisation is not a dimensions that often arouse contestation. Nevertheless, in assessing the benefits of globalisation and the social impact, 8. Among the examples cited in the study, stocks of three issues need to be taken into account: A three-minute The gains are not uniformly distributed across phone call between New York and London that individuals, regions and countries. More recently, there has been an upsurge in the extent of migration into the EU, prompted in part by conflicts in other parts of the world, but The potential threats from unfettered globalisation available at home. In many EU countries, encompass distributive impacts, such as adverse immigration from the recently-acceded member consequences for specific groups and regions, states has also been substantial, fanning fears about issues of cultural hegemony, potential the social consequences and burgeoning demands environmental damage and geo-political disruption. The process of globalisation, including its drivers 6. Still, even for some of those who might be seen as and social consequences, is summarised and victims of globalisation, it is important to stress the illustrated in Figure 2. Globalisation is not a static phenomenon, however, and there is no certainty that it will either continue real incomes, which benefit from lower prices along the same path or remain a predominantly of imports. American-led and neo-liberal phenomenon. As they and labour markets. The recent increase in the price of oil empirically. Swiss Institute for Business Cycle Research website Increasingly, too, businesses are finding new ways inference to draw from these observations is that it of subdividing economic activity among nations. As a result, the crude idea that it is the unskilled who What are the core policy challenges? Many of the fears surrounding globalisation are analysis. India today competes not just on the cost greatly exaggerated and even where justified tend of its unskilled workers in producing mature mass- to rest on an incomplete analysis of the process. It manufactured goods such as clothing, but also in follows that to view globalisation as an inexorable

skill-intensive areas such as software development and threatening force is simply unwarranted. This and medical diagnostics. Still, it is clear that globalisation will be The most important message for policy-makers is to their jobs rather than an opportunity. A core challenge is to achieve economic flexibility with better social protection, Nonetheless, the empirical evidence for an erosion so as to foster an environment capable of making of social provision is, quite simply, striking the best use of the opportunities offered by because of its absence. Social protection outlays as globalisation. In this context, social policy has a a proportion of GDP have remained remarkably vital role to play, not least in endowing people with stable over the last two decades and it is capabilities, with an emphasis on active policies noteworthy that some of the most successful that intervene early rather than passive, reactive economies in northern Europe achieve high policies. The policy challenges of globalisation can employment rates and enviable degrees of equity, be grouped under three main headings: I s Social Europe Fit for Globalisation? Adjusting to globalisation implies policy complemented by effective policies to protect those developments that will in turn have social impacts who lose from globalisation. Much can be achieved and create uncertainties that need to be managed as by retraining and other active policies aimed at social risks. Labour turnover can be expected to redeploying workers, although there will be some grow higher, putting a premium on the groups beyond the reach of such measures. The governance challenge is to put in place Although active labour market policies are seen as mechanisms that achieve these aims without part of the answer, they are not a panacea and need imposing an undue burden on competitiveness. Thus, while labour market policies have to be at the they are often costly and are prone to inappropriate forefront of an adaptation strategy, a coherent and incentives. An implication is that policy learning complementary strategy for social protection and and experimentation are needed to find solutions social inclusion remains vital. The ease with which that are effective, as well as attuned to conditions in adjustment can be achieved will also be shaped by the different member states. Regulatory fragmentation and the capacity to adjust dominance of national regulatory regimes could result in a zero- or negative-sum game, the prospect The of globalisation in the long term, yet have a short- governance challenge is to ensure that the existing term impact “ often negative “ on social cohesion processes including the Lisbon agenda, the that makes them politically awkward to implement. The core of a social policy response is in the effective at re-employing workers who lose their following main policy domains: At the same time, there are and the reshaping of social protection. To the extent that it is the lower skilled who are most vulnerable to the effects of globalisation, With regard to training and skills, these can and there are grounds for labour market policies aimed should be enhanced by due attention to the level of specifically at these groups. Yet, it has also to be education of vulnerable target groups. It is recognised that globalisation does not stand still. Hence, it is reasonable to expect further In relation to migration, there is an evident need for increases in trade intensity, financial market new and more comprehensive policies to promote integration and the spread of technology. Whether the social integration of different types of migrants and how the very speed of this process can and into the economy and society of the host country. Furthermore, beyond the scope of social policy and of the study given that national migration policies are bound to discussed here. Services reconfiguring it in w ays consistent w ith the such as childcare may well be part of the equation, values espoused by the European social not least for target groups such as female migrants. In addition, early intervention to improve the Drawing on insights from various contributors to quality of basic education should be part of a shift the analysis of how social Europe is changing and in emphasis in the welfare state to prevent the what makes it likely that a country will prosper in emergence of social problems. These are summarised in Table 1. Globalisation is not the only rationale for The challenge facing welfare reform is not about reinventing the w elfare state“ defending or opposing levels of social expenditure or casting doubt on specific benefits or rules. Policy mechanisms and institutions Our fond hope is that the discourse on globalisation have to be adapted to the changing economic can be altered to reflect this analysis. CEPS serves programmes and through collaborative research networks as a leading forum for debate on EU affairs, but its most involving the active participation of other highly reputable distinguishing feature lies in its strong in-house research institutes and specialists:

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