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BUSINESS, ECONOMICS AND FINANCE

GLOBAL PATTERNS OF ECONOMIC AND SOCIAL DEVELOPMENT. COULD NEW APPROACHES OF DEVELOPMENT LEAD TO WORLD PEACE IN THE NEW MILLENNIUM? *

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The current crisis in global security affairs was long coming as a result of serious and growing cultural, economic, political and military conflicts between certain developed and developing nations. Some of these conflicts are recent, while most have historical roots. Such conflicts have led to extremism, terrorist attacks, wars, and major security problems in many parts of the world. In the long run, the roots of the problems, rather than the symptoms, must be identified and dealt with. These may include economic and social problems in both developing and developed nations, injustices inflicted on the people of developing nations by both internal and external forces, the rise of religious and nationalistic extremism, racism and discrimination, dictatorship, and lack of democracy.

A major problem facing most the so-called Developed Countries is the obvious Disequilibria between Economic and Social Development. That is between Material and Human Development. The rapid technological developments in western/northern nations during the past century led to rapid, yet imbalanced, accumulation of wealth and power. Unfortunately, such material progress came at high social and human cost. The results include a breakdown in social structures and families, stress, human depression, high crime and suicide rates, the widespread of immoralities, and a decline in social and spiritual values. Furthermore, new economic and energy needs led these countries to look into new possibilities to exploit resources beyond their geographic borders, and revisit the notion of military, cultural and economic invasion of foreign territories. On the other hand, eastern and southern cultures have lagged behind in technological and material progress while trying to hold on their social and spiritual traditions. Meanwhile, these so-

called Developing Countries after their independence from long foreign occupations have been plagued with poverty, corruption, dictatorships, lack of education and poor health care. One must wonder, which approach is better for human development and welfare? East/South, or West/North The answer is probably neither. Both models of development have serious problems. In fact, the current gaps in material, social and spiritual values among nations, together with the widespread injustices have resulted in major global conflicts, wars, and violence.

The new approach to development that the author recommends is based on concurrent economic and social development. The human factor in development should not be ignored or scarified as in classical capitalistic and communist systems of development. Both have failed. The most advanced stage of development has not been reached in any country yet. It is a model where a society enjoys concurrent material, social and spiritual tranquility and maturity.

This paper will first discuss some of the causes and remedies of global security problems. Then the focus will shift to problems facing both developed and developing nations. Finally, the author will propose a new balanced model to national economic/social development. Applications to Egypt will be addressed.

THE AUTHORITY MODEL: A MEANS TO COMMUNITY DEVELOPMENT

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Many developing countries have an on going problem with the development and maintenance of infrastructures. For instance, Cairo has a sewage system that is in much need of repair and enlargement mainly due to the rapid growth in population.

Governments tend to develop infrastructure revival and development through a monolithic governmental structure that requires direct action of the government, thereby making it difficult to delegate power and responsibility to small independent groups who would be responsible for the development of the infrastructure with a minimum of government interference. The solutions to the infrastructure problem for developing countries are varied and difficult.

Specifically, Cairo has numerous infrastructure problems such as utilities, sewage, parking, solid waste, transportation and so on. While many advances have been made in these areas, the increasing population mandates that on going projects must be developed and maintained. In order to solve these critical problems in Egypt, a new model may be in order. One such model is the use of authorities for the development and maintenance of various infrastructures.

FUTURES, PLANNING, SCIENCE AND TECHNOLOGY

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In this context we deal with first the FUTURE as a desirable and then deal with Science and Technology as a TOOL to achieve that desirable. The focus is on the Tools of Science and Technology namely Planning, Research, Education and Training and Information Technology in the Information Age. Then we deal with how they can be used to achieve some basic initiatives that can make for a desirable future.

Planning will focus on Thinking Outside the Box by considering strategic initiatives, such as Decentralization, Economic Growth, Human Resources as Capital and the Information and Communication era. We shall endeavor to surmount the narrow focus of highly trained professionals and deal with WHAT is to be considered.

It will deal in a High Level view of the initiatives to be addressed and will focus on WHAT is to be considered leaving the HOW it is to be done to a secondary meeting should some of the listeners wish to discuss that.

Following is a listing of the initiatives considered and the discussion of the benefits and risks of the Science or Technology to be used. It should make for an interesting session.

Following are some of the headings of themes to be addressed:

- Decentralization and demographics
- Education vs. Training and Employability
- Globalization
- Economic Development
- Information, Communication and Transportation.

A discussion of such issues with intellectuals in an open seminar forum promises to be a most interesting and illuminating experience.

DEVELOPING EGYPT VIA BETTER SCIENTIFIC AND TECHNICAL EDUCATION AND TRAINING

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Science and technology should play a pivotal role in the industry-based economic growth of Egypt in order to overcome its difficulties and raise the standard of living of people in the 21st century. To that end, the industrial production should improve in terms of its (1) breadth, (2) diversification, and (3) depth [1]. In this paper, the author highlights a number of educational and training issues that significantly affect the achievement of these goals.

Increasing the production volume (breadth) requires more laborers, technicians, analysts, designers, scientists, and engineers; this requires reducing illiteracy, changing curricula, changing the student mix at various educational stages, and replacing the science-humanity split at the high-school level by a more balanced educational system to increase the number of students specializing in science and technology.

Diversification of the industrial production requires diversification of courses at all educational levels including vocational education, industry-school partnerships, multidisciplinary research at universities, and a wider range of sub-specialty knowledge and training.

Having more depth in the industrial production, and hence more "added value", requires embracing the concept of project work throughout all educational tages, bridging the gap between supply and demand, stronger state support for R&D (research and development), aligning the interests of university faculty, R&D centers, and industrial corporations, and more targeted collaboration with technologically-advanced countries and expatriate Egyptians. R&D should be regarded as a national project for the advancement of Egypt; this includes design,

development, research, technology transfer, and reverse engineering [1].

TECHNOLOGY TRANSFER ECONOMICS: DEVELOPING ECONOMIES

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The author feels that solutions must be sought to alleviate the growing recognized disparities in economic and social conditions throughout the world. Although such disparities have always existed, they were not so easily recognized until the recent advances in the technology of world communications, such as satellite or under-ocean fiber-optic based television signal transmissions. The recognition of these disparities has already begun to lead to significant economic and social distresses throughout the world. Although both the cause of and recognition of these disparities is a result of recent technological developments such as those mentioned, the author feels that the only solution to reducing the economic and social distresses of the present and those certainly to come in the future is technology itself. The author believes that the reduction of such distresses cannot occur without an increase in the standard of living of the many developing areas of the world. The author also believes that no country can hope to have, or to maintain, a higher standard of living without the application of some form of technology throughout its economy.

In the first part of the paper the author will make some general observations concerning the impacts of technology on various aspects of an economy, as well as the integration of technology into the global economy. Following that, the author will concentrate on the more specific case of the development of technology in developing economies through the process of Technology Transfer.

POLITICAL AND SOCIAL SCIENCES

SOCIO-POLITICAL DIMENSIONS OF SCIENTIFIC RESEARCH

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One of the main aspiration echoed during the enthusiastic drive towards modernization of Egypt has been the creation of a genuine climate for scientific research that enables Egyptian scholars to compete with their counterparts in advanced societies. This paper reflects certain observations and provides a few directives that may enhance the atmosphere of scientific research in the Egyptian universities and research centers.

The above-mentioned observation relates to the current practices as they appear in the Egyptian universities and research institutes with special reference to the provinces and not just the greater Cairo. The directives are expressed in the form of suggestions and recommendations that should pave the way toward a genuine climate for scientific research in Egypt.

In this regard, the author emphasizes three main components that must exist in order to reach a competitive research level in Egypt. There are

1. Political and social support
2. Qualified staff and facilities
3. Ethics and traditions of scientific research

A promising achievement in scientific research and technology requires some basic attitudes on the part of policy makers and the public at large, the availability of the proper skills and devices and the adoption of ethical measures and procedures that ensure research progress and validity.

PUSHING FOR THE PROSPECTIVE US-EGYPT FTA

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The Egyptian desire to conclude a US-Egypt Free Trade Area (FTA) has never been greater than during recent months. Egypt was shrugged off the US priority FTAs agenda in 2003 after reversing course with the U.S. and deciding not to cosponsor a US complaint against the E.U on GMOs related concerns. The US cited, in addition, that Egypt's IPRs (Intellectual Property Rights) protection regime was wont of revision; and the liberalization of the banking and insurance sector(s) and giving effect to the "lame" mortgage law were also urged. Other pieces of legislation, e.g., the long pigeonholed competition law -(a.k.a. antitrust), are also expected to be issued before talks get reinitiated.

Since 2003, other countries have moved in to replace Egypt. Morocco and Bahrain are two examples. Now, with Jordan having signed a US FTA already in 2000, and with the current US identification of Oman and the UAE for next signatories, Egypt has reason to start worrying. Egypt is equally disparaged by periodic calls in the US congress to phase out US aid to Egypt.

The recently concluded QIZs agreement amongst Egypt, Israel, and the US might help mitigate the adverse trade diverting effects that those FTAs are bound to have on Egypt's trade, but only partially. Likewise, the QIZ is an inferior trade arrangement when compared to full-fledged FTAs, and the requirement of Israeli local content for product qualification into the US market may prove to be a limiting factor.

Egypt should continue to push for a US-FTA for a number of reasons, chief among which are the following: The US market represents one fifth to one third of the entire world market, and Egypt should respond positively to the seemingly unstoppable US strategy of signing bilateral FTAs to ensure its trade interests are served outside the stalled WTO forum.

The facts relating to the way the U.S. is pursuing its FTA talks in the Middle East advise of the following:

- Early comers get sweeter deals, as the bar is constantly raised for the newer ones. More and more, the U.S. is pushing for an effective tie-in between FTA negotiations and its more comprehensive Middle East reform agenda;
- The earlier the conclusion of an FTA, the more opportunities for carving a country niche for itself, e.g., as an industry, finance, or pure trade hub; and
- FDI and business opportunities would tend to favor early starters.

This essay hopes to assay the motivations and implications for Egypt to embark on a FTA negotiation process in light of and in response to the US global trade strategy. Whereas the motivations for Egypt may have to do with economic perks of sorts, the implications would certainly present challenges to the existing climate in Egypt; and commitment to a general, meaningful, and continued reform agenda would present itself as a key challenge.

How do challenges relate to opportunities in the evolving context, and how far is Egypt willing and able to go down that path, and in what timeframe remain the perplexing questions?

RESEARCH ETHICS TRAINING IN EGYPT: DESCRIPTION OF A TRAINING PROGRAM

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Significant growth in health research has occurred in Egypt during the last ten years. Such growth in research activities needs to be accompanied by a commensurate development of ethics review capacity and bioethics infrastructure. Research in Egypt will be hindered without adequate ethics review. To enhance Egyptian bioethics capacity, a training program in research ethics is being conducted under a grant from the Fogarty International Center of the National Institutes of Health in the United States. The training program will include educational programs, research grants, and performance of research in the field of research ethics.
A description of this training program is provided at: http://medschool.umaryland.edu/epidemiology/hretie.html.
Educational programs will include:

Fellowship Program in Health Research Ethics: The Fellowship Program is a two-year training program in research ethics that leads to the granting of a Master of Science Degree. The program is open to physicians, nurses, scientists, bioethicists, lawyers, philosophers, social scientists, and other scholars. Successful candidates will spend twelve months doing course work at the University of Maryland, Baltimore, Maryland, USA. Trainees will receive a stipend that is expected to cover their living expenses in the USA, tuition fees, economy class airfare, and laptop computer. Trainees will spend a second year in Egypt performing a research project in research ethics. Trainees are expected to make a substantial impact in their institution/community in the field of research ethics. Applications are due by 10th January, 2005 and trainees are expected to arrive in the US in June of 2005.

Workshops: Workshops on Research Ethics will be held annually in Cairo and other cities in Egypt. Individual workshops will also be conducted for research ethics committees in Egypt.
Research Grants: Research grants in the amount of 3,000 Egyptian pounds are available to qualified individuals to conduct small projects in research ethics.

Research in Research Ethics: To understand the attitudes and perspectives of individuals involved in research in Egypt, we plan to perform research consisting of interviews and surveys. The first project will involve an interview study of members of Egyptian research ethics committees. We will present a more complete description of this research project and as well as preliminary findings at the 2004 Association of Egyptian-American Scholars Conference.

MOON EPHEMERIS CORRECTIONS

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In the previous AEAS Conference of May, 2004 paper (Practicality of the conventional clocks of Sun and Moon) citations are given of the surprising non existence of accurate data for the moon distance from earth, which is needful to determine its orbital motion.. Existing moon ephemeris proved non accurate, using few simple observations of the moon rise and set times; compared with the most reliable existing published data of the Washington DC Naval Observatory. (The rise and set times are in many times off by more than 45 minutes.) These and existing published data of the moon ephemeris are formulations of data available since year 200 before BC. The average moon month period, since that time, is approximately 29.53 days. This means that the moon month is needed to be corrected, from the consecutive 29 and 30 day month periods (previously explained in the paper of AEAS June 2000) by addition of one day, every 33.33 months. It appears also that the phases of the moon following these conclusions are not aligned with the existing real moon ephemeris. This is in concern of the perigee and apogee times and the inclination of the moon orbit.

In this paper a program is proposed for practical moon observations using one or more of the Middle East observatories (where the sky is clear in long periods of the time) for a time span of, at least, few months. The principal observations are concerned with the exact times of every day moon rise and set times, in combination with the azimuth angles, of every day rise and set locations in the sky. More involved parameters would be the follow up of the moon location in the sky as function of the clock ticking of the day. The latter is a more involved program which would help increase the accuracy of the predicted orbits of the moon.

The measured data would be compared with parametric computations of the moon rise and set times for different expected orbit configurations of the moon and application of the necessary

corrections for the analysis. The computations of the moon rise and set times, in any location of the globe, are already established in the previous May, 2004 AEAS paper and proved to be consistent with the published data of the Washington, DC, Naval Observatory.

Further checking's for correctness of the conclusions would be confirmed by periodic repetition of some of the previously described measurements in arbitrary time periods. Some repetitions of these measurements would also confirm the monthly expected month periods of the moon month in different earth locations.

These analysis and measurements are of immediate need. Another long term analysis is to be performed for continuity of the study of the moon ephemeris which is being proved to be influenced by the electromagnetic interactions with the varying earth magnetic fields. Long term evaluation of these and other new findings is subject of steady research programs.

CORPORATE SOCIAL RESPONSIBILITY AND ACCOUNTABILITY: IS IT RELEVANT TO THE INVESTMENT IN EGYPT?

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With markets to watch, competitors to match, financial reports to prepare, several governmental regulations to meet, and several product profitability strategies to consider, there's often little time in busy workweek to think about how to report about their social responsibility and accountability in Egypt. But national and multinational companies doing business in Egypt who focus solely on the numbers do not tell us anything about the underlying health of the business or its likely future performance, and there many companies are still managed predominantly by financial information. At the international level, the fast growing requirement, for local and multinational companies, to report on their social and environmental practices forces them to understand where value is created in conducting their business in Egypt.

A major objective of corporate social responsibility is to play a fundamental role in achieving corporate global objectives of growth, competitiveness, better governance, and sustainable development. Today, globalization creates new challenges: how to develop global trading relation that support the corporate future long and short-term goals, how to reduce unemployment, and how to ensure greater environmental protection. Components of corporate social responsibility include investment in community outreach, employee relations, creation and maintenance of employment, environmental responsibility, human rights and financial performance.

We conclude from our analysis that (1) the successful implementation of the right model of CSR should lead companies to improving its total performance, (2) CSR practices of companies doing business in Egypt should be business driven, part of a

business strategy and culture, (3) the policies and guidelines of CSR must be developed from within the organization and be adapted to its specific characteristics and circumstances, and (4) most importantly, local and multinational companies operating in Egypt must balance its social goals with the equally important goal of increasing shareholders' value.

PERSPECTIVES ON EDUCATION AND LEADERSHIP IN THE TRANFORMATION OF EGYPT

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It is already two decades since Egypt has embarked on its inexorable process of change and multifaceted socio-political transformation to foster a better quality of life for the Egyptian citizens. It is axiomatic that change and transformation processed are by and large difficult and challenging. This, by all counts, is clear and evident in many sectors, and nonetheless manifested by the Egyptian national system of education.

In this paper, it is maintained that the process of transformation of the venerable Egyptian school system is apt to stumble on the familiar rough and tumble terrain of the legacy of rigid policies, dysfunctional practices, misguided assessments, and inappropriate values and goal structure. In addition to these formidable challenges, the Egyptian school system is burdened, and even shackled, by a highly centralized superstructure that on one hand admirably seeks to introduce and implement radical changes, but on the other hand unwittingly impedes the desired transformation.

The purpose of the discourse in this paper is not to criticize the state of affairs of the Egyptian school system. That approach has been heavily used, and this paper declares, enough of that. It is high time to reflect on the way things are in a constructive way and suggest venues for restructuring and transforming. There is a dire need for reconfiguring the school system's infrastructure, for refocusing the mission, values and purpose of the educational enterprise, and for redesigning the strategies for accountability. And, decidedly this new approach needs the expertise, skills, and effectiveness of collaborative and transformational leadership.

MEDICAL AND HEALTH

REPEAT CONTRACTION IN FRAGILE X SYNDROME: TIMING OF (CGG)n TRINUCLEOTIDE REPEAT TRANSITION

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Fragile X syndrome (FRAXA), the most common form of inherited mental retardation in man, is caused by expansions of an untranslated CGG repeat array in the FMR1 gene that usually coincide with hypermethylation and silencing of the gene. Reduction in the insertion size of an amplified fra-X allele is an uncommon mutation event, not frequently seen in fra-X transmission. We reported on two families who exhibited mutation size reduction during maternal transmission of fragile X chromosome. In the first family, a premutation carrier (72 repeat units) grandmother showed a remarkable heterogeneity in the transition state of her fragile X allele during its transmission to her two daughters. Whereas, repeat expansion to a larger premutation allele (113 repeats) was observed in one of her daughters, who was a mother of two mentally retarded full-mutated fragile X boys, mutation-size reduction to a contracted premutation allele (62 repeats) has occurred during transmission to the second daughter. A different mutation size range reduction event was observed in the other family, where one of two affected fragile X brothers showed, in addition to his hypermethylated full mutation allele, a variety of his cells with unmethylated allele of 3.4 Kb (Δ 600 bp) in size. This allele was not visible in his mother's DNA, which carries a full mutation with the smallest mutation size range detected at 6.0 Kb on the inactive X chromosome. A mechanism of a large reduction in the expanded allele to an unmethylated one, sized in the overlapping range of largest permutation/ smallest full mutation rather than that of maternal germline mosaicism has been assumed. Our results present a compilation of such cases with CGG repeat contractions rather than the usual expansions. In addition, we add the novel observation of differential FMR1 instability in a FRAXA family, a finding which strongly draws the

attention to the presence of certain polygenic factors, all acting together at a very early postzygotic stage and could have the capacity to control or to modify the progression and stability of fra-X mutation, indicating that mutation-dynamics of the trinucleotide repeat in fragile X syndrome might be a multifactorial trait controlled not only by mutation related factors of repeats' size and sequence motif variability, but also individually genetically determined factors contribute.

Key words: fragile X syndrome, repeat contraction, triplets, mutation dynamics.

PUBLIC HEALTH IMPLICATIONS OF GLOBAL WARMING

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The environmental changes brought about by global warming may have wide-ranging implications on public health. When I speak about health, I refer to a complete sense of physical, social, psychological and environmental well-being, and not simply the absence of illness, disability or eco-pathological conditions (An Ecological Definition of Health, EL-Ahraf and Hanson, 1972). Simply put, at the very least, global warming has an effect on the well-being of human populations across the globe.

As the evidence deepens about the effects of global warming, people have to face the fact that our activities are key to the developing problem, as clearly stated by the Intergovernmental Panel on Climate Change (IPCC)-- "the balance of evidence suggests a discernible human influence on global climate". The IPCC verifies the finding that the Earth's average surface temperature has increased since 1861.

The effects on public health will vary according to the severity of ecological conditions and the vulnerability of a certain population as determined by their age, nutritional status, environmental health standards, and uses of technology. In general, as temperature increases, precipitation changes, soil moisture elevates and sea level rises with potential adverse public health conditions resulting from heat waves, changes in air and water quality, spread of communicable diseases, droughts, floods, storms and population displacement. It is important to note that although these effects are not certain, enough bases of knowledge, data from simulation models, and experience with historical epidemiological episodes point to explicit and reasonable predictions of the potential impact of global warming on public health.

NEURODEVELOPMENTAL ASSESSMENT OF INFANTS WITH NEONATAL CLINICAL SUBTLE SEIZURES

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Objectives: 1) - Neurodevelopmental outcome assessment among preterms with subtle seizures (SS). 2) - Detection of Factors associated with poor neurodevelopmental outcome among infants with SS.

Methods: A prospective analytic study of 44 preterm: 22 with history of subtle SS in their neonatal period, compared to 22 control preterm infants with no seizures. Neurodevelopmental assessment was conducted at 9-12 months corrected age, using neurological exam and CAT-CLAM scale, abnormal developmental quotient (DQ) was defined as DQ< 70. Multiple regression analysis was run to detect factors associated with unfavorable outcome.

Results: Abnormal/suspect neurological examination occurred among 81.8% of the SS infants compared to 50% among the control preterm infants, p<.026. Mean CAT-DQ among the SS infants was 67.7±9.8 compared to 76.1±8.4 among the control infants, p< .004. Mean CLAM-DQ among the SS infants was 64.4±11.2 compared to 75±9.2 among the control infants, p< .001.Multiple regression analysis revealed a significant inverse relationship between birth weight and CAT-CLAM < 70 with an OR: 0.03, CI: 0-0.8, p<.041. CAT < 70 was associated with the cause of Seizures, with an OR: 7.1, CI: 1.5-33 p<.013.

Conclusion: Subtle seizures are associates with remarkable adverse neurodevelopment in the first year. The etiology of seizures and birth weight are the determinants of poor outcome. Further follow-up of this cohort is recommended.

VON WILLEBRAND DISEASE AND INHERITED BLEEDING DISORDERS IN MENORRAHAGIC ADOLESCENTS

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ABSTRACT

Objectives: The study planned to evaluate the prevalence of von Willebrand disease (VWD) and other inherited bleeding disorders in adolescent females with menorrhagia without identifiable cause.

Subjects & Methods: The study conducted on 115 adolescent females with idiopathic menorrhagia and 35 controls. Menorrhagia was defined by using Pictorial Bleeding Assessment Chart (PBAC) with score > 100. Subjects were interviewed in-person and blood was drawn for coagulation tests including platelets count & function, prothrombine time (PT), partial thromboplastin time (PTT), vonWillebrand factor antigen (VWF:Ag)& its activity (VWF:Ac); FVIII antigen (FVIII: Ag)& its activity (FVIII:Ac) and F IX antigen (FIX: Ag) & its activity (FIX: Ac) assay. Laboratory results for menorrhagic cases were compared to controls using specific ranges developed from control group. A test was considered abnormal if it exceeded two standard deviations below the control mean. Provided selected criteria for VWD identification including positive family history of bleeding with deficiency of either VWF:Ag or VWF:Ac or both.

Results: Overall detection of inherited bleeding disorders among all studied idiopathic menorrhagic adolescents is 43.4% including 27.8% (32/115) matching criteria for VWD; 11.3%(13/115) had FVIII deficiency and 4.3% (5/115) with FIX deficiency. Positive family history of bleeding was found in 68.8% of menorrhagic cases matching criteria of VWD .It was found that 25.2% of all studied menorrhagic adolescents had either decreased VWF:Ag

concentrations or activity (VWF:Ac) while 22.6% had decreased both concentrations & activity.. The mean concentrations of either VWF:Ag(72.9± 26.1%) or VWF:Ac(76.6 ± 28.3 %) in studied menorrhagic adolescents were significantly lower than that detected in controls (119.8± 14.25%), (107± 8.82%) (p< 0.001, p= 0.000) respectively. Past history of other bleeding in the form of epistaxis, bleeding with dental procedures was found in 46.9% of VWD menorrhagic adolescents versus 53.1% of them without (p< 0.01).

Conclusion: These findings indicate the importance of considering inherited bleeding disorders as a cause of menorrhagia in particular VWD. It is emphasized the importance of careful medical history& factors which were highly predictive of inherited bleeding disorders such as menorrhagia since menarache. It is recommended further study involving both the incidence& severity of VWD in community to avoid unnecessary procedures and also recommended the initiation of an expanding educational program that match the growing body of knowledge of VWD for population.

HEPATITIS C VIRUS (HCV) INFECTION IN MOTHER AND CHILDREN IN RURAL EGYPT

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Hepatitis C virus (HCV) is a highly endemic disease, and a leading cause of hepatic disease morbidity and mortality in Egypt. Despite its high prevalence in rural Egyptian communities, little is known about the incidence and natural history of HCV infection in maternal and pediatric populations. Our ongoing cohort study of HCV infection in three rural villages in Egypt aims to study (1) the prevalence of HCV infection in pregnant women, (2) incidence of maternal-infant transmission of HCV, and (3) the incidence rates of community acquired HCV infection in the mothers and children. To date, 3,002 women enrolled during the second or third trimester of their pregnancy, were interviewed, and examined by an obstetrician and had 8 to 10 ml of blood drawn. After delivery, the mothers and their children returned for follow-up visits at 2 and 6 months as well as 1, 2, 3, 4 and 5 years after birth. Mothers and their children were interviewed for demographic information and HCV-related risk factors, followed by complete pediatric examinations, and drawing blood samples. Serum specimens were evaluated for antibodies to HCV (anti-HCV) and HCV-RNA. Baseline anti-HCV prevalence in the pregnant women was 16%, of whom 72% were HCV-RNA positive. During follow-up, the incidence of HCV infection in mothers was 3.06 per 1,000 person-year of follow up (95% CI [1.06, 5.06]). Maternal-infant transmission of HCV was 2.6% (7/272 infants born to HCV-RNA positive mothers). The geometric mean of HCV viral titer of mothers who transmitted HCV to their infants was significantly higher than those who did not transmit the infection (9.15×10^5

IU/mL vs. 3.36 x 10^5 IU/mL, *P=0.004*). Six children who were initially negative became infected, resulting in an incidence rate of community acquired HCV infection of 1.65 per 1,000 person-year of follow up (95% CI [0.33, 2.97]). Updated results and risk factors of HCV infection, and viral clearance will be presented.

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DOES HEPATITIS B PAST INFECTION AFFECTS THE HISTOLOGICAL SEVERITY OF LIVER DISEASE AND RESPONSE TO INTERFERON BASED THERAPY IN PATIENTS WITH CHRONIC HEPATITIS C GENOTYPE 4?

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Introduction: Egypt has a high prevalence of hepatitis C (HCV), predominantly genotype 4. HCV and hepatitis B (HBV) have common route of infection.

Aim: 1) Study the prevalence of HBV past infection in chronic HCV patients. 2) Study the impact of HBV past infection on the severity of hepatic fibrosis, inflammatory activity, steatosis, and response to interferon/ribavirin therapy.

Patients and Methods: 191 consecutive naive patients with chronic HCV and negative HBs Ag were studied. HBc Ab was studied, and HBV DNA and tissue immunohistochemistry were studied in patients with HBc Ab positive. Demographic, laboratory and liver biopsy data, according to modified Ishac score, were collected.

Results: 76/191(40%) had HBc Ab positive; all of them had negative serum HBV DNA and tissue immunohistochemistry. HBc Ab was positive in 2/18 patients (11%) with stage 0-1 fibrosis, 60/147 (41%) with stage 2-4 and 14/26 (54%) with stage 5-6 (P= 0.01). In multivariate analysis, to adjust for other variables, HBc Ab was the independent predictor of severe hepatic fibrosis (P=0.02). HBc Ab has a tendency for association with inflammatory activity (P=0.06), and no association with steatosis (P=0.2). 50% of HBc Ab positive and 45% of HBc Ab negative have SVR (P=0.6).

Conclusions: 1) Past infection with HBV is common among chronic HCV patients in Egypt. 2) Chronic HCV patients with past infection of HBV have higher risk to severe hepatic fibrosis. 3) Past infection with HBV appeared to have no relation to steatosis or response to interferon therapy.

THE CREDIT OF ELECTRONICS IN THE GENETICS REVOLUTION

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The medical industry is building upon the knowledge, resources, and technologies currently emanating from the human genome project to further understanding of genetic contributions to human health. As a result of this expansion of genomics into human health applications, the field of genomic medicine was born.

Genetics is playing an increasingly important role in the diagnosis, monitoring, and treatment of diseases. The ultimate goal is to use this information to develop new ways to treat, cure, or even prevent the thousands of diseases that afflict humankind. However the road from gene identification to effective treatments is fraught with challenges.

Genetic advances sparked by the Human Genome Project will affect the practice of medicine in the next 20 years. In the meantime, biotechnology companies are racing ahead with commercialization by designing diagnostic tests to detect errant genes in people suspected of having particular diseases or of being at risk for developing them. The current electronic availability of this knowledge is expected to revolutionize biology and medicine, but how?

HEPATITIS C INFECTION IN EGYPTIAN CHILDREN SINGLE CENTER EXPERIENCE

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The outcome of hepatitis C virus (HCV) infection acquired in childhood is uncertain because of the diversity of the epidemiological and clinical features of infection and disease.

Objective: The aim of this study was to determine the outcome of HCV infection in 105 Egyptian children who tested positive for HCV antibody.

Methods: The data of 105 HCV antibody positive children presenting to the Pediatric Hepatology Unit, Cairo University Children's Hospital, between: 1995-2002 were retrospectively analyzed for risk factors. Seventy-four children with available PCR results were further analyzed clinically, serologically and histologically.

Results: The ages ranged from 1.3 to 22 years; mean age 11.2 $\pm$ 4.9 years. History of blood transfusion was found in 81 children (77%). HCV RNA was detected in 58.1% of 74 children. Persistently elevated ALT levels were present in 40 patients (54.1%). Hepatitis B virus markers (HbsAg and/or HBcAb) were detected in 18 patients (24.3%). Twenty-six of the 43 HCV RNA positive children underwent a diagnostic liver biopsy that showed chronic hepatitis in 19 patients (73.1%), cirrhosis in one case only (3.8%), and normal biopsy findings in 7 children (26.9%).

Conclusion: Blood transfusion remains a major risk of HCV transmission among Egyptian children. HCV infection is not always benign in the childhood period. ALT levels remain elevated in half of the children and histological abnormalities are detected in three quarters of HCV RNA positive cases.

MICROORGANISMS CONCERNS IN DRINKING WATER

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Worldwide, about 1.2 billion people lack access to safe drinking water, and twice that many lack adequate sanitation. As a result, the World Health Organization estimates that 3.4 million people, mostly children, die every year from water-related diseases.

The EPA regulates the safety standards to microorganism, contaminants or pesticides according to the Safe Drinking Water Act of 1974. This Act was establish safe standards of purity and required operators of public water systems to comply with primary (health-related) or secondary standards. Since 2001, the public health goal to publish newly regulated contaminants very five years. The common microbiological contaimination of water are Coliform Bacteria (E-Coli), Giardia Lambia, cryptosporidium, Hepatitis A, Helminthes. The EPA cannot guarantee that water with a contaminant level below the standard is risk-free or neither higher level is unsafe. The standards cannot take in account the presence of other chemicals that may increase or decrease the changes of toxicity of the contaminant/pesticide. The contaminant levels are applied a maximum level which are allows a margin of safety. Chronic effects result from exposure to a substance over a period of weeks or years. The chemical characteristics of pesticides (insecticides, miticides, nematicides, herbicides, plant growth regulators, fungicides, bactericides and many more) determine the resulting health effects.

With pesticides applied to crops by aerial spraying, topsoil application (granular, dust or liquid formulations), soil injection, soil incorporation or through irrigation, soil injection and incorporation pose the greatest likelihood for groundwater contamination. The application of pesticides through irrigation (chemigation) can also cause groundwater contamination. An irrigation pump or malfunction of backflow equipment cause a water source -- well,

pond or stream -- or cause highly concentrated pesticide levels to be applied to a field. There are state laws requiring backflow prevention devices on any irrigation system equipped to inject chemicals. These devices are also required by Federal pesticide labels.

Even where water treatment is widely practiced, constant vigilance is required to guard against waterborne disease outbreaks. Well-known pathogens such as E. coli are easily controlled with chlorination, but can cause deadly outbreaks given conditions of inadequate or no disinfection.

HEPATITIS C IN EGYPT: A CONCISE REVIEW

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Since the hepatitis C virus (HCV) genome was first described in 1989, it has become the most important cause of liver disease in the world. The World Health Organization estimates that 3% of the world's population has been infected with HCV and that there are over 170 million chronic carriers. Despite recent improvements in treating adult HCV infection using pegylated interferon and ribavirin, about half of a highly selected group of infected individuals will fail treatment. Considerable research efforts to produce an effective HCV vaccine have not yet been successful. The prevalence of HCV in Egypt is very high. Our reports along with others suggest that 15-18% of the 65 million people in Egypt are chronically infected with HCV. This is twice the number of infected people as in the USA. HCV is the predominant cause of chronic liver disease in Egypt and surpasses both hepatitis B virus (HBV) and schistosomiasis. The highest prevalence of HCV in the general Egyptian population is in the Nile Delta in Lower Egypt (24.3%), and the lowest prevalence is in Upper Egypt (8.7%). Large epidemiologic studies have identified a huge reservoir of infection in the country's rural population, most likely due to the mass schistosomiasis treatment campaigns during the 1950s until 1982. This 30-year control program using multiple injections of intravenous (IV) tartar emetic is believed to be the cause for this high prevalence of HCV in Egypt. Current community prevalence of HCV is directly related to the amount of IV tartar emetic used in the past to control schistosomiasis. The lowest rates (<10%) are in Cairo and Alexandria and the highest (>20%) in rural areas of the Nile Delta (Lower Egypt). There is little information on the prevalence of HCV in Egyptian children. One convenience sample found no anti-HCV positive cases among 12 one to three-year olds

and 21 four to nine-year olds. One study examining 84 blood-transfused children between 6 months-to-15 years of age found 55% to be anti-HCV positive. Another study, also of multiple transfused children found an HCV prevalence of 55%. An earlier study of ours in the Nile Delta found 12.1% of 190 8-to-12 year old schoolboys to be anti-HCV positive. A third community-based study in the Delta found 7% (50 of 712) 0 to 9-year olds to be anti-HCV positive. A similar community-based study in Upper Egypt (where overall HCV prevalence is lower than that of the Delta) found 1.8 % (16 of 878) children between the ages of 0 to 9 to be anti-HCV positive. Reports on perinatal transmission in Egyptian children have varied tremendously due to marked differences in study design, selected populations and small sample size. We believe our mother-infant cohort in three rural villages in the Nile Delta is the largest community-based perinatal HCV study. To date, we have identified 11 (4%) perinatal infections in children born of HCV-infected mothers from a cohort of 3,009 having a 1-in-10 prevalence of HCV-RNA. All of these studies confirm HCV is a substantial problem in Egypt.

ENGINEERING AND TECHNOLOGY

EVALUATION OF MODIFIED LEATHER DYEING TECHNIQUE USING BLACK DYESTUFFS FROM THE ECONOMICAL VIEW

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From the economical point of view, this work illustrates the effect of compact dyeing technique of chrome tanned leather on the final quality of wet-finished leather in which all wet-finishing steps are in one drum, using black dyestuffs (Acid black 210 and Remazol Black B), with low concentrations, this was done alternative to that used in leather industry,. In case of soft leather dyed with acid black 210 and top dyed with remazol black B the colour strength of both grain and flesh sides increases when using a mixture of (chitosan/non ionic surfactant, after storing for five days), while the dye penetration decreases in compared with heavily retanned leather impregnated with a mixture of (sodium alginate/non ionic surfactant, after storing for five days) under the same condition without affecting the exhaustion percentage of the dye bath. Using Remazol Black B, the colour strength and the dye bath exhaustion were not influence, while the total dye penetration through cross-section of the dyed leather was improved under the action of either sodium alginate mixture or the natural tanning materials. In addition to, the effect of this new technology on the final properties of wet-finished chrome tanned leather such as: light and rubbing fastness, mechanical properties and thermal stability were studied.

Key Words : Leather, reactive dyes, acid dyes, non-ionic surfactant, chitosan, sodium alginate, colour fastness.

DEVELOPMENT AND MANUFACTURING OF FLAT ANTENNAS FOR SATELLITE RECEPTION

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A low-cost high-efficiency flat plate antenna was developed for direct broadcast satellite (DBS) or Direct-to-Home TV (DTHTV) applications. The antenna is built in a multilayer structure comprising radiating elements and feed networks with different arrangements, depending on the sense and number of polarizations of the electromagnetic radiation. The layers are separated from each other by non-conducting material, with no direct contact between the radiating elements and the feed lines in the array. This leads to the low manufacturing cost of the antenna. The LNB that dowconverts the RF signal to the L-band for the TV receiver box is set in a housing that is specially designed to fit the flat antenna structure.

This patented technology has been licensed on a non-exclusive basis to Matsushita Electric Works (MEW) in Japan, Hexawave in Taiwan and Satellite Equipment Manufacturing Company (SEMC) in Egypt and resulted in commercial products, which sold very well in Japan, and in Europe. Over million units have been sold for use with the Japanese DBS system and the Astra system in Europe. Production in Egypt was geared primarily towards the Middle Eastern market of the Egyptian satellite NileSat. The product comes in different forms for outside mounting, for indoor mounting, in very small size for outdoor entertainment, and with satellite tracking for vehicle use.

The Egyptian production was subsequently transferred to Globaltronics, also in Egypt, and the LNB adaptor to the antenna structure was redesigned to allow the use of less expensive commercially available LNBs. This would reduce the cost of the antenna assembly further, and would make it more competitive in global markets.

The paper reviews the general design ideas and addresses the two models of product development adopted with two of the licensees. The paper also addresses the potentials for the antenna in the Middle Eastern, European and American markets.

ENHANCING ORGANOPHOSPHORUS PESTICIDES DETOXIFICATION USING INTERGENERIC PROTOPLAST FUSION BETWEEN ESCHERICHIA COLI AND TWO DIFFERENT BACTERIA GENERA

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Recently we isolated certain E. coli strains from contaminated spots of Marriute Lake, Alexandria province, EGYPT that showed capabilities for organophosphate pesticides degradation. The promising strains of those isolates had been chosen for protoplast fusion with Bacillus thuringiensis D55 and Agrobacterium tumefaciens. The protoplast fusions capabilities for OP biodegradation were assayed and compared with their parental bacteria genera. Interestingly, the performance of the hybrids for OP biodegradation was enhanced with time progress and showed tremendous biodegradation efficiency. The hybrids degraded up to 250µg/ml of Paraoxon completely 54 days after hybridization.

USING NEURAL NETWORKS TO DESIGN COLD-FORMED STEEL SECTIONS

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Structural steel is used in two main forms: hot rolled and cold-formed sections. Hot rolled sections are by far the most widely used, and are the stronger of the two. However, there are many advantages to cold-formed steel. It is much lighter, more flexible in use, and more environmentally friendly. Cold-formed steel is used extensively in buildings, and its use in frames and trusses is increasing. There is now a growing interest in their use as primary structural members, especially in small span industrial and agricultural building and steel housing systems. This interest has led to use of cold-formed steel remaining buoyant even during the 1990's recession. One of the major obstacles to the greater use of cold-formed steel is the flexibility of the ways in which it can be used. For instance, there is an almost limitless range of section profiles that can be used, each offering different advantages. Furthermore, failure is more complex with local buckling often being an important factor. All this makes design with cold-formed steel significantly more complex than design with hot-rolled steel. Most design programmes do not offer any cold formed sections, mainly because they have been rarely used. The problem is how to identify the "best section", and that the analysis process is far from simple. The work described here describes some of the preliminary work which is part of a project that aims to use neural network technology to overcome many of the difficulties of designing with cold-formed steel.

Neural networks have received increasing attention in the last fifteen years or so. They form one part of the artificial intelligence spectrum, but in many ways can be viewed as pattern recognition systems, or as an extremely powerful and versatile multi-dimensional surface fitting tool. There are many variations of neural networks, but the most common is the multi-layer perceptron network. This consists of a layer of nodes representing

the inputs, one or more hidden layers of nodes, and a final layer of nodes representing the outputs from the system. The nodes in each layer are connected to all the layers in the succeeding layer, and each connection is assigned a weight. Associated with each node is a simple non-linear function, typically the sigmoid or tanh function. The values of the weights determine the output of the system for a given input. The network is *trained* by presenting it with a series of known inputs and outputs. The weights are chosen in order to minimise the error between the target outputs and the predicted outputs. Training of a network is the most difficult aspect of creating an effective network. First a comprehensive training set has to be obtained, then the network has to be trained. Training is equivalent to solving a very difficult optimisation problem. The error surface typically has many false minima, and convergence can be very slow, or can go to a false minimum. However, once a network is trained it produces results extremely quickly. Neural networks are effective when there is a relationship between the inputs and outputs, but there is no simply delineated rule or set of equations for expressing this relationship. This may be because the relationship is too complex, or some of the inputs or outputs are not easily quantifiable, e.g. ease of construction.

The aim of the project is to develop neural network tools that can assist the designer in selecting the appropriate section profiles, and this paper describes preliminary work to achieve this end. Selecting the section profile involves two aspects: (i) is choosing the general geometric profile (e.g. C section, Z section etc), the other is then choosing the dimensions for the particular profile.

Work so far has been restricted to three profile types: hat, lipped and plain sections. In this case the geometry can be described by three parameters. The code ECP2001 was used to calculate the ultimate moment capacity for a vast range of section profiles. From these results a database of “best” sections was produced. The criterion used in this preliminary work was simply minimizing the weight of the section. This data was used to train the neural networks to choose the section profile type and dimensions for a given design criteria.

Two broad strategies were adopted. In the first an attempt was made to develop a single network that would predict the profile type and dimensions. In the second strategy a network was trained for each individual profile type, so there were separate networks for the plain, hat and lipped sections. An additional network was then trained to choose the best profile type for a given design criteria. So the complete system worked by first using one network to choose the profile type, this then branched to a further network of the appropriate type that selected the dimensions for the profile.

This second strategy was found to be more successful, giving lower overall errors. Furthermore, this second strategy was found to still give reasonable results for the design load of its chosen profile, even when it had not selected the best profile type.

It is intended to extend the current work to cover many more profile types, and to use other design criteria. The second strategy described above is likely to be the more successful, as it is unlikely that a single network could effectively handle all the various combinations that are available.

THE ROLE OF SCIENCE AND TECHNOLOGY IN THE FUTURE DEVELOPMENT OF EGYPT: A STRATEGIC SCENARIO

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Growth and development have always been powerful and motivating forces for people, business and nations. One can say the old saying " you are either growing or shrinking, there is no middle ground." The country development aims to create and implement strategies that achieve both economic and societal value for better future.

One of the critical issues in learning, learning and learning, and the role of science and technology in the development process. Brainpower, the soft side of technology, is becoming an organization's most valuable asset and conveys a competitive edge in the market place. Only countries that make use of their science, technology, knowledge, capabilities and expertise will succeed in a dynamically competitive environment and achieve desirable future development.

The real challenge, however, is how to apply successfully the two sides of technology (soft and hard) and focus on strategically on the priorities of development process. The 2004 Nobel prize Winner in Economics: Professor Edward Prescott, Arizona State University, states that the difference among nations in development is on how to conduct their technology towards clear and specific objectives rather than wasting their time criticizing the reasons of failure. Thus, Egypt, in its quest fro success and desirable development, must face the real challenge of application of both sides (soft and hard) of science and technology in the society. Life is no longer simple, one can cannot anymore just hope that "things will work themselves out". Egypt is challenged to become strategic thinker rather than wishful thinker, if it desires to achieve future development and ensures prosperity and modernization to its people.

This research aims to provide a composite picture of the critical relationship between science and technology and future development programs. In addition, an integrated strategic methodology is introduced to build the necessary requirements and what aught to be done for achieving future development of Egypt.

COULD VIRTUAL PRODUCT DESIGN TEAMS WORK WITHIN THE EGYPTIAN INDUSTRY?

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Advances in computer technology and the exponential growth of the Internet have created opportunities for local and global communication, which were never before possible. These opportunities include the possibility of product design within a virtual environment. Furthermore, the manufacturing industry in the 21st century is faced with a rapidly changing market demands and global competition. Customers require that manufacturing companies make more products with high quality, low cost, perfect service, utmost personalization and above all quick delivery and short lead-time. In this new setting, the use of virtual product design methodologies and tools is imperative to allow competitiveness of the Egyptian products in the global market. In addition to resource optimisation, the virtual work practices offer an interesting solution for organizing work in an Egyptian social environment characterized more by disorder than by discipline. In a scenario where members of the product design team are all in the country or even in the same city, virtual practices can also facilitate the work and save a lot of time. When some of the team members are in one of the industrial cities such as the 10th of Ramadan and other members are in Cairo, virtuality can be extremely appealing since it puts aside a lot of exceptionally lengthy transportation activities, unnecessary transportation cost and the need of replacing an absent human resource.

This paper continues on a previous research by the authors that introduced an almost cost-free methodological framework and a tool serving as an organizer of work practices of virtual product

design teams destined to developping countries. The framework provided stresses on the definition of actors and modules. Actors are the team members attending the work sessions (meetings). They might include: the designer, the process planner and a market researcher. Modules include: design, market research, data management, constraints management, tools and more. The last three modules, however, do not necessarily correspond to an actor who is a part of the design team and who necessarily attends the web-meetings. They are taken care of by a Webmaster (a team of Webmasters) who ensures coordination, updates and checks consistency among any shared data prior to scheduled meetings. The implementation of the previously contributed methodology and tool was assessed in two egyptian industries and the results are presented in this paper. Three major factors were used to do the assessment: the size and composition of the virtual team, the communication frequency and intensity among the members and the management and development of the virtual team. The assessment related these factors to two performance criteria: creativity enhancement and ressource optimization. Obstacles to virtual design as well as facilitating elements enabling the promotion of such practices within the Egyptian industries are thouroughly dicussed.

Key words: Design, Virtual teams, concurrent engineering, product development, Egyptian industry.

TEACHING EFFECTIVENESS AND GLOBALIZATION OF ELECTRICAL ENGINEEING EDUCATION

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With rapid advances in communication and information technology, globalization has become a reality in many aspects of today's interactive world environment. Economics as well as the engineering profession are among the top foundational elements shaping the global events. The energy sector in general and interconnected electrical power networks in particular have long been cross-border linked. While globalization has direct benefits in effective sharing of technology, resources and experience among the nations, it introduces great challenges in its implementation due to the diversity in both cultural differences and technical standings. Engineering education must now include the global nature of system design constraints. In the past two decades, engineering and technology applications have sharply grown. Graduate engineers are required to not only learn vast amount of technical information in a four- or five-year period, but also gain sufficient knowledge of economical and cultural impact in a multidisciplinary worldwide setting.

In this paper, the effects of globalization on engineering education are investigated. The global trends in engineering curricula are reviewed. A comparison is made between typical power engineering curricula in the US and those in Egyptian universities. The significance of language proficiency, communication skills and technical writing capabilities are pointed out. The objectives of future curriculum restructuring efforts are identified. These efforts must be both locally applicable and based on self-assessment and continuous improvement techniques.

EXPLORATION GEOPHYSICS FOR ENVIRONMENTAL AND GEOTECHNICAL APPLICATIONS IN EGYPT

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Characterization of subsurface targets is becoming increasingly important. Advance knowledge of the target type can have important economic impact on excavation procedures especially in Engineering Evaluation/Cost Analysis (EE/CA) projects.

The science of Exploration Geophysics has long used non-destructive methods to identify subsurface characteristics of underlying rocks, formations, minerals and groundwater. These tools are used today extensively to assist in our environmental needs for the exploration of subsurface features and buried objects. The key advantages of geophysical methods are their abilities to make rapid, inexpensive, noninvasive, nondestructive measurements.

Numerous geophysical methods are used in many applications including: mineral and petroleum exploration and production, environmental contaminant mapping, mapping subsurface ground conditions for civil engineering projects, hydrological (groundwater) mapping, mapping near surface utilities, detection and mapping of unexploded ordnance, and archeological investigations. The following paragraphs illustrate some of the important environmental applications of geophysical techniques that affect the development plan in Egypt.

Exploration Geophysical can offer solutions to the following major development projects in Egypt:

Southern Valley Development Project:
The Southern Valley Development (Toshka) Project is an attempt to develop new urban and agricultural areas away from the Nile Valley. The sustainable development of this region can be achieved only through an improved, quantitative understanding of

groundwater aquifer. Significant sources of groundwater will need to be discovered and developed. Drilling wells is the most expensive and final stage of an exploration process for water. Geophysics is a proven technique for both reconnaissance and detailed exploration for groundwater. Based on the results from the geophysical survey, wells can be more accurately placed to fully develop the Nubian sandstone groundwater aquifer in Western Desert.

Underground (Metro) Project:

The underground and Metro project in Cairo and Alexandria is an attempt to develop a good transportation system to ease the connection between cities and solve the problem of crowding in the other means of transportation. It is extremely difficult to plan for the subway route without using accurate and up to date maps for the utilities lines (pipelines, power lines and communication cables). So, it is highly desirable to find a non-invasive method of determining the location and depth of such utility lines instead of the conventional drilling-based approach. This can be achieved by geophysical imaging or scanning of the underground without damaging power lines, water pipes or communication cables. Safety of construction projects depends on exact knowledge of buried objects in the planned excavation areas. Hitting an unknown, high-pressure gas line can and has caused loss of lives.

Landmines detection in Western Desert and Sinai:

Egypt has been listed as the country most contaminated by landmines in the world with an estimate of approximately 23,000,000, this includes unexploded ordnance (UXO). There are very large areas of land affected, and some estimates put the total area at 25,000 sq kilometers.

Development projects in Egypt are significantly constrained by landmine and UXO contamination in the affected areas, the civilian casualty rate seems high in proportion to the populations in those areas. Recent ground and airborne geophysical sensors proved to be successful tool for detection of landmines and UXO especially the metallic ones.

Geophysical methods, like any other means of measurement, have advantages and limitations. There is no single, universally

applicable geophysical method, and some methods are quite site-specific in their performance. However, professional and efficient use of Geophysical techniques can help in a many development projects in Egypt.

ENHANCEMENT OF THE OPTICAL AND ELECTRICAL PROPERTIES OF ITO THIN FILMS DEPOSITED BY ELECTRON BEAM EVAPORATION TECHNIQUE.

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Indium tin oxide (ITO) is widely utilized in numerous industrial applications due to its unique combined properties of transparency to visible light and electrical conductivity. ITO films were deposited on glass substrates by an electron beam evaporation technique at room temperature from bulk samples, with different thickness. The 1500 Å film thick was selected to perform annealing temperature in the range 200-400 ^{o}C and annealing time from 15 to 120 min at 400 ^{o}C. The x-ray diffraction of the films was analyzed in order to investigate its dependence on thickness. Annealing temperature and time. Electrical and optical measurements were also carried out. Transmittance, optical energy gap, refractive index, carrier concentration, thermal emissivity and resistivity were investigated. It was found that the as-deposited films with different thickness' were highly absorbing and have relatively poor electrical properties. The films become opaque with increasing the film thickness. After performance the thermal annealing the resistance decreases and a simultaneous variation in the optical transmission occurs. A transmittance value of 85.5% in the IR region and 82% in the visible region of the spectrum and a resistivity of 2.8 x 10^{-4} Ω Cm were obtained at annealing temperature of 400 ^{o}C for 120 min.

Keywords: Indium Tin oxide; X-ray diffraction; thickness effect; Annealing effect; Optical transmittance, Electrical resistivity

DEPLOYING WIRELESS SENSOR NETWORKS IN EGYPT

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In recent years, advances in miniaturization; low-power circuit design; simple, low power, yet reasonably efficient wireless communication equipment; and improved small-scale energy supplies have combined with reduced manufacturing costs to make a new technological vision possible: Wireless sensor networks. A sensor network is composed of a large number of sensor nodes, which are densely deployed either inside the phenomenon or very close to it. The position of nodes need not be engineered or pre-determined. This allows random deployment in inaccessible terrains or disaster relief operation. We will present an overview of advances in wireless sensor networks technology and its future trends and applications, and in particular in Egypt.

SUSTAINABLE GREEN BUILDING DESIGN AND CONSTRUCTION

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In 2002, the World Summit of Sustainable Development in Johannesburg, South Africa, produced a revolutionary concept that sustainable development must be implemented with concrete actions and measurable results. Also, the Kyoto Protocol, commonly referred to as an innovation agenda, is designed to drive new sustainable technologies so that the globe could reach its emission reduction targets.

There has been significant research around sustainable design and construction, however, there is a need for more understanding of how buildings impact on humans and the environment can be reduced while remaining economically viable. For example, environmental impact of buildings in the US includes 65.2% of total U.S. electricity consumption, 36% of total U.S. primary energy use, 30% of total U.S. greenhouse gas emissions, 136 million tons of construction and demolition waste (approx. 2.8 lbs/person/day) and 12% of potable water.

Sustainable Green Building Design and Construction is a group of practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in five main areas including site planning, safeguarding water and water efficiency, energy efficiency and renewable energy, Conservation of materials and resources and Indoor environmental quality. Green Buildings possess many benefits such as the reduction of the impacts of natural resource consumption, enhances occupant comfort and health and minimizes strain on local infrastructures and improve

quality of life. They also reduce operating costs, lower utility costs and optimize life-cycle economic performance.

To standardize the process of green buildings the Leadership in Energy & Environmental Design (LEED) was created in the USA. LEED is a system for designing, constructing, operating and certifying sustainable green buildings. It was also created to facilitate positive results for the environment, occupant health and financial return, providing a standard for measurement and use as a design guideline.

Understanding and Applying Sustainable Building Practices in designing and constructing a sustainable green building presents special challenges to engineers and other design professions. The Mornningside elementary school in Toronto is the first school in Canada to be designed and built with the LEED criteria for green buildings. The design of this $15 Million Dollars building incorporates many features that could become the norm in the quest for sustainable design.

This paper provides the state-of-the art for sustainable green buildings design and construction. It also provides an insight to the LEED criteria and its standards. A comprehensive case study analyses for the application of the LEED criteria in the design and construction of the Mornningside elementary school in Toronto will be presented. The case study will include the process and criteria for the design and construction.

SPHINQS: NEXT GENERATION TOUR GUIDE SYSTEM

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Pervasive computing (also called Ubiquitous Computing) is the next generation computing environments that will make information & communication technology available everywhere, for everyone, at all times. It is a new trend of computing whose vision is to increase spontaneous interaction between tiny ubiquitously-connected wireless computing devices in the environment. These devices are not personal computers as we tend to think of them, but are very tiny – even invisible – devices that are either mobile or embedded in almost any type of object including cars, tools, appliances, clothing and various consumer goods. Moreover, these devices communicate through increasingly interconnected networks to provide various services without users being explicitly aware of their existence.

We propose SphinQs, an integrated tour-guide information system. SphinQs investigates the use of Pervasive Computing to create smart environments within tourist sites. As an example scenario of the use of SphinQs, consider a group of users touring a museum. At a SphinQs registration point in the museum, each user is given a handheld device with audio and video capabilities, possibly an off-the-shelf PDA (Personal Digital Assistant). Alternatively, if a user already possesses a personal device, he or she can register this device and gain access to SphinQs. Once deployed, the system can be easily expanded to provide many different services to a large user population.

As a pilot project, we considered the Egyptian Museum and investigated the application of this state-of-the-art technology to the museum environment by offering multiple services to its visitors. As users move around the museum, information about items on display is made available to them instantaneously through their handheld devices in various convenient formats. Examples of such services include, but are not limited to:

- Museum map: This service displays a map of the museum with all its exhibits and attractions. All exhibits and displays in the museums will be searchable and directions to locations of interest will be provided from the user's current location.
- Instantaneous information: This service offers historical textual, graphical, and audio-visual information about artifacts within the user's range.
- Group tracking: In order to keep groups connected; this service keeps track of all members of a group so they can easily track down each other.
- Messages/alerts exchange: Extends on the previous service, where users among a group can exchange messages or receive alerts from their guide.
- Users can use the system to reserve and purchase tickets to exhibitions and shows in the museum later in the day.

We believe that creating such an environment that combines modern technology with ancient history will provide a unique experience for visitors of Egypt's tourist attractions.

EFFECT OF ANNEALING AND IN_2O_3 DOPING ON THE PROPERTIES OF ELECTRON BEAM EVAPORATED ZNO FILMS

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The effect of both annealing and In_2O_3 doping on the properties of ZnO films prepared by electron beam evaporation were investigated. The evaporation was carried out at room temperature from bulk samples prepared by sintering technique. X-ray diffraction showed that the structure of ZnO-In_2O_3 films depend on both the In_2O_3 content and annealing temperature. Amorphous, highly transparent and relatively low resistive films which can be suitable for the usage as transparent electrode of organic light-emitting diode were obtained upon annealing at 300 °C. Partially crystalline, highly transparent and highly resistive films which can be used in piezoelectric applications were obtained upon annealing at 500 °C. For each composition refractive index were increased upon increasing annealing temperature.