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Nature at Your Service

World Environment Day 2011 was observed all over the world under the theme “Forests; Nature at Your Service”. SQU, represented by CESAR, celebrated this international observance with an array of activities. The poetical diction depicting the theme of the observance is full of significance. Forests cover one third of the earth’s land mass, performing vital functions and services around the world which make our planet alive with possibilities. They play a key role in our battle against climate change. Forests are the most biologically diverse ecosystems on land, and are home to more than half of the terrestrial species of animals, plants and insects. They are the green lungs of the earth, vital to the survival of people everywhere. Despite all of these priceless ecological, economic, social and health benefits, we are destroying the very forests we need to live and breathe.

When it comes to Oman, about 2,000 hectare of this country is forested, according to FAO. The whole area is classified as primary forest, the most bio diverse and carbon-dense form of forest. Oman’s forests contain one million metric tons of carbon in living forest biomass. The country has some 629 known species of amphibians, birds, mammals and reptiles according to figures from the World Conservation Monitoring Centre. Of these, 2.2% are endemic, meaning they exist in no other country, and 4.8% are threatened. Oman is home to at least 1204 species of vascular plants, of which 6.1% are endemic.

Global deforestation continues at an alarming rate, every year, 13 million hectares of forest are destroyed. Many precious species face extinction. Biodiversity is being obliterated. But this trend is not irreversible. It’s not too late to transform life as we know it into a greener future where forests are at the heart of our sustainable development and green economies. Conserving forests and expanding them need to be recognized as a business opportunity. According to UNEP, targeted investments in forestry could generate up to 10 million new jobs around the world. The services forests provide are essential to every aspect of our quality of life. The answer to sustainable forest management, moving towards a green economy, lies in our hands.
Omani National Centre for Hematology and Spinal Transplant

In response to the Royal orders of His Majesty Sultan Qaboos, Sultan Qaboos University recently approved the establishment of the Omani National Centre for Hematology and Spinal Transplant at a cost of RO 19.65 million. The centre will be a scientific medical beacon and an important achievement added to the University Hospital.

H.E. Dr. Ali bin Saud al Bimani, SQU Vice Chancellor, hailed the Royal support of His Majesty the Sultan towards the establishment of the Omani National Centre for Hematology and Spinal Transplant. The construction of the centre comes in response to the Omani society’s need for an advanced facility to manage blood diseases, which are common in the Sultanate.

The centre consists of five floors. The first floor includes the outpatient clinics, paediatric day care, adult day care, day care observation, pharmacy and spacious reception areas. The second floor includes the blood labs. The third floor includes wards for children suffering from blood diseases such as acute leukaemia, sickle cell anaemia, thalassemia and others. The fourth floor includes wards for adult patients suffering from blood diseases.

The fifth floor includes 12 rooms for spinal transplantation, 12 rooms for post transplant as well as male and female companion rooms. Dr. Ahmed bin Salim al Mandhari, Director-General of Sultan Qaboos University Hospital said that the building is provided with high quality equipment including air filters that prevent any particles more than 1 micro millimetre from entering the place.

It also includes special water filters fixed at the wash basin and the washing hoses to prevent bacteria from spreading through water. The food served to patients is also sterilised with JAMA.

Deakin’s Presents a Lecture on Entrepreneurship Culture at SQU

H.E. Dr. Ali Al-Bemani Vice-Chancellor of SQU met Professor Kevin Hindle, director of the Centre for Entrepreneurship, Innovation and Community at Deakin University Australia. During the meeting, several issues were addressed concerning ways of scientific cooperation between SQU and Deakin University.

The two sides dealt with many common scientific and research issues and ways in which to encourage further collaborations in those fields. H.E. Dr. Ali Al-Bemani emphasized the importance of cooperation in the applied and research fields and pointed out the role of the university in encouraging entrepreneurship and innovation and providing good environment and incentives for innovations. In a discussion panel regarding this topic, attended by a number of academics and administrators from different colleges and centers of the university, Prof. Kevin Hindle delivered a lecture entitled “Entrepreneurship and community issues and their connection to Sultan Qaboos University”. In it, Prof. Hindle discussed the concept of entrepreneurship and analyzing the community’s system preceding any commercial projects and initiatives regarding human and material resources, identifying global trends and studying whatever goes in conformity with the community. Prof. Hindle pointed out how to practically apply technologies, from being theories in universities and institutions, in the industrial and commercial sectors.

He also stressed the importance of having an academic program that spreads a culture of entrepreneurship and innovation in the community, the universities and all the scientific and humanities colleges. At the end of the lecture, he pointed out the importance of designing suitable programs for the Omani society that can meet its needs, providing these programs through accessible networks as well as holding courses and workshops specialized in this field in universities and colleges.

Prof. Kevin Hindle is an entrepreneurship expert who won professional awards such as the United States Academy of Management Award for Innovation in Entrepreneurship Education in 2004, being the first non-American ever to win the price. Among the many other awards, he also won in the same year the Australia’s Entrepreneurship Educator of the Year award. Prof. Hindle has over 90 scientific publications in a range of respected international journals many of which are peer-reviewed and has participated in many international conferences. He is the head of Australia’s Global Entrepreneurship Monitor project providing entrepreneurship and innovation consulting services in Australia and a number of universities and international organizations.

Sultan Qaboos University Council Hold its 4th Meeting

The Sultan Qaboos University Council recently held its fourth meeting for the academic year 2010-2011 headed by Dr. Rawiyah bint Saud al-Busaidiyah, Higher Education Minister and Chairperson of the SQU Council.

The Council’s rapporteur reviewed the follow-up report on implementing decisions of the Council’s previous meeting for the academic year 2010-2011 and the Council’s extraordinary session held last April.

The meeting also reviewed a follow-up report of implementing decisions taken at the third meeting and the extraordinary session, as well as decisions under the process of the process of implementation.

The Council in addition, approved proposals referred by the committee formed for SQU Silver Jubilee celebrations in November.

The Council also approved budget of the university and its hospital for the fiscal year 2012, in addition to approving lists of graduates of mid academic year 2010 - 2011.
Over recent decades, unprecedented global advancement has occurred in the production, exchange, and processing of information, as well as its analysis and use. The impact of this advance may exceed that brought about by the Industrial Revolution, since the infrastructures of information and communications technologies (ICTs), their equipment and their software, have come to play the role of society's nervous system.

This paper reviews part of the diagnostic on the status of ICT and arabinisation in the Arab world as surveyed in a number of regional and international development studies such as the Arab Human Development Reports – particularly the 3rd, the Arab Knowledge Reports, the UNESCO and the World Bank. It highlights the fact that, in 2008, the number of those using the internet in Arabic approached 60 million, which means that the access of Arabic speakers to the internet is close to 17 per cent of the population of the Arab countries. The Arab countries have made noteworthy progress in most of the pivotal aspects of ICT and in particular in infrastructures, where investment is ongoing. In 2008, they recorded levels of development in technological performance exceeding those observed in all other regions of the world.

However, scrutiny of the Arab knowledge landscape reveals an acute and serious digital gap. In discussing the impact of ICT on Arabic language processing systems, machine translation, grammar checking, and spelling. The paper caroms against the indiscriminate and uncritical use and deployment of Arabic digital content on the net, which still requires the availability of translation systems to and from the main languages. More effective Arabic search engines are also required. Technologies to mine, process, and retrieve content also require automated indexing and summarising systems. In addition, it is essential to develop advanced systems for automatic speech processing including automated speech analysis, generation, and recognition in Arabic.

Admittedly, there are some software systems for machine translation to and from Arabic. One prominent example is the Google system. This adopts statistical methods which make it impossible for the quality of its translations of texts to go beyond very modest limits, rendering it unfit for serious translation. There is also software that adopts an overly simple linguistically and lexically based analytical model. Since their launch around three decades ago, attempts to improve the performance of such machine translation systems have failed. Another system developed by an Arabic company is based on a transformational model and relies on a limited base of linguistic rules and lexical data, which limit the possibilities of improving its performance.

As for the grammar checking, neither of the two systems in use uses an automated corpus of previously processed Arabic text as a store or contextual examples. They are thus incapable of recognising grammatical errors that occur when the words and syntactical elements in question are far apart and of adding the syntactically significant final vowels to words, especially in the long sentences prevalent in Arabic texts. Of the three systems for morphological analysis, two are distinguished by complete linguistic coverage of the whole of the Arabic lexicon and one of these enjoys a coherent linguistic foundation which makes it capable of deriving semantic elements from morphological and lexical aspects. Among the faults of the third system is the errors it generates when dealing with words with multiple and compound affixes. Search engines for Arabic text are an extremely limited on the internet. Many of the sites which allow the discovery of Arabic texts are no more than directories comprising lists of Arabic website addresses. The Google Arabic search engine is reckoned to be the most used Arabic search engine on the net. In addition to being far from meeting most of the search requirements for cultural and educational applications, it also enjoys only modest success in meeting most of the requirements of the ordinary user. This search engine does not take into account the complex derivational and morphological formation of Arabic words in comparison with the simple formation of English words for which the system was designed. It searches for a word as it appears in the text without paying attention to its lexical lemma, which may appear in as many as a thousand forms as a result of the affixing of prefixes and suffixes to the Arabic word. This search engine is also incapable of broadening the scope of a search on the basis of the users search terms. Thus, when the user enters a verb like “wasala” (reached/connected), for instance, the engine will not give, literally, hundreds or rather thousands of vocabularies, tenses and significations derived from this word. (A brief review of the numerous pages given in the well-known lexicon “Lisan al-Arab” would be sufficient to give us an unlimited number of meanings, connotations or forms, traditional, modern or potential, derived from this word).

When such engines or translation software and dictionaries and lexicons were used for translating phrases or long paragraphs, the output could be a combination of the absurd and the ridiculous. The distinct defining lines between the singular and the plural, the male and female, the past and the present etc. are completely obliterated. Google will not return other related morphological forms like “[you/she] [we] etc.

Internet use and the spread of Arabic on the net present interrelated opportunities and challenges that call for unconventional approaches to broaden its user base and raise its status. Favourable policies and initiatives must be adopted; regional and international partnerships must be entered into. Digital content related to the Arab countries should also be produced and distributed in foreign languages. Creating advanced search engines, automatic translation systems, smart processing of scripts, semantic searching, and the deployment of interactive websites to facilitate learning are among the tools needed to ensure the spread of a language on the net. In this context, we cannot deny or underestimate the significant roles, initiatives and experimental contributions undertaken by a multitude of institutions, agencies and individuals to achieve these targets. The parties concerned with translation and arabinisation range in size, programmes, resources and aims from the Arabic language academies, translation centres and software companies on one hand, to the more modest, yet innovative and influential initiatives in academic circles such as the activity of the Translation Group at Sultan Qaboos University on the other.

(Dr. Fayiz Suyyagh is a socio-economist and Senior Visiting Researcher in the Centre for Strategic Studies at the University of Jordan. This article summarises the paper “Translation and Information Technology: Skills, Challenges and Risks”, that Dr. Fayiz presented in the annual translation symposium organised by the Translation Group at SQU this year.)
The Mighty Soufriere Hill Volcano

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The Soufriere Hills volcano began to show increased activity in terms of small pyroclastic flows and rock falls from the middle of May, 1997. In the very early morning of June 25, 1997 the seismologists began to notice swarms which indicated an impending eruption. Swarms are tremors that occur in hundreds per day and may continue for days and even weeks. Though volcano prediction is more accurate than earthquake prediction it still remains very difficult to pinpoint exactly when an eruption will happen in spite of all the sophisticated monitoring equipments. From an early stage the Montserrat Volcano Observatory (MVO) predicted continuing increased volcanic activity and the dangers associated with them. All the concerned people in the administration including the Governor, Chief Minister and other ministers were informed of the scientists’ concern about possible pyroclastic flow. Essential services in the capital city Plymouth were evacuated and the scientists working in the field were alerted. Live update of the situation at the volcano was broadcast on Radio Montserrat. Phased evacuation of the Montserrat airport was recommended by MVO. Plymouth siren sounded at 12:45 p.m. (local time).

After morning huffing and puffing for a few hours, the volcano finally erupted catastrophically at 12:55 p.m. on Wednesday, June 25, 1997. A big mushroom-like plume of smoke from the volcano dominated the sky of Montserrat and ash cloud rose up to 10 km in a matter of few minutes. The Governor of Montserrat who was with the scientists at the airport to observe the volcano was advised to leave the airport and go to a safe viewing position north of the airport. All members of the MVO staff were contacted to confirm their safety. Montserrat Defense Force and Police Force came out in their vehicles to join the rescue operation. The Chief Scientist of MVO continued to brief the authorities at the Emergency Operation Center (EOC) of the latest situation at the volcano. The rescue teams were able to rescue a few survivors. MVO helicopter started reconnaissance flight over the affected area to look for survivors and rescue them. It did rescue a few people but had to discontinue the operation because of the strong wind carrying ash. Ash can cause malfunctioning of an aircraft engine. There are instances of damage to jet aircraft as a result of an ash encounter. All four engines of a British Airways Flight 9 cut out and restarted afterwards when it was flying through an ash cloud of the Galunggung, Indonesia volcanic event in 1982. In December, 1989 a KLM Boeing, Flight 867 while flying to Anchorage International Airport, Alaska, USA encountered similar problems near Mount Redoubt, Alaska. In April 2010, airspace all over Europe was closed—which was unprecedented—due to the presence of volcanic ash in the upper atmosphere from the eruption of the Icelandic volcano Eyjafjallajökull (pronounced roughly ay-uh-fyat-luh-yoe-kwutl). Ash fall is a nuisance and at times it could be dangerous!

Tragically nineteen people were killed, the capital city Plymouth, the airport and seven villages were destroyed by the major pyroclastic flows of June 25, 1997. Those who were killed were reluctant to leave their farmlands in spite of being warned by the authorities that they were risking their lives living in the exclusion zone. Exclusion zone is a zone in the hazard map that is considered most vulnerable to the onslaught of a volcanic eruption. It is also possible that some of those got killed might not have heard the sound of the siren while they were working in remote farmlands. The eruption of Soufriere hills volcano in Montserrat created a stir in the national politics of the island followed by a change of government. The ripples of this political unrest even crossed the Atlantic to reach the House of Commons in UK where there was a hot debate on the sufferings of the people of Montserrat caused by the volcano.

Each year sixty volcanoes erupt around the world, about 12 of them may be active at any particular month but only a few are very powerful. The eruption of Indonesia’s Tambora volcano in April, 1815 is recognized as the most powerful eruption in recorded history. As a result of this ‘super-colossal’ eruption, there was no summer in Europe and North America the following year. Like magnitude scale for earthquake, some volcanologists, mostly from United States, have devised a way to measure how powerful a volcano is. This eruption magnitude scale called ‘Volcanic Explosivity Index (VEI)’ goes from 0 to 8. Unlike Richter scale used for measuring strength of an earthquake, VEI is not widely used in volcanology. The largest dome collapse at Montserrat volcano on 12/13 July, 2003 involved 210 million cubic meter of dome material (MVO website). According to the eruption magnitude scale this largest dome collapse of Montserrat volcano has VEI value 3 (meaning “severe”) against 7 (meaning “super-colossal”) for Tambora. “Severe” event usually occurs yearly whereas a “super-colossal” event occurs every few thousand of years. Eruption history of Montserrat volcano shows that the volcano erupted in 1995 after a few hundred years of ‘inactivity’. Since 1995, the volcano is very active and it erupts at least once a year (MVO website). This may indicate that the Montserrat volcano may be either in the process of changing its status from ‘severe’ to ‘non-explosive’ or in the process of going back to its period of least activity or hibernating state so to speak. Volcanologists now-a-days believe that no volcano is dormant, all are active. Perhaps none of them is as many years violently active as the Soufriere Hills volcano of Montserrat.

In the beginning of my involvement with the volcano I did not share with others describing a volcanic eruption as nature’s one of the most spectacular events mainly because of its destructive power. Whenever any co-worker used the word ‘spectacular’ while describing the volcano in my presence I used to add my views by saying ‘spectacular and devastating’. Whatever adjective we use to describe a volcanic eruption there is no doubt that volcanoes can be considered as a creative force as well – they have shaped the Earth’s surface and have created some of the most scenic places on our planet. Some scientists believe that volcanic activities at some point in the evolution of the Earth perhaps created our atmosphere and the oceans.

(This is the second part of the article “Experience with a Live Volcano” published in Horizon issue 218 dated May 30, 2011)
SQU Receives AUC Delegation

H.H. Dr. Mona bint Fahad al-Said, Assistant V.C. for External Cooperation, received recently Prof. Medhat Haroun, Chief Academic Officer at the American University in Cairo (AUC), and his accompanying delegation during their visit to Oman.

The two sides reviewed a number of common scientific and research issues to encourage collaboration in various fields of research between the two universities. H.H. Dr. Mona bint Fahad al-Said emphasized the significance of research collaboration especially that the University has so far made major accomplishments in this field both nationally and internationally. The University aspires to focus more on scientific areas that serve the community such as the solar energy, nanotechnology, fisheries, etc.

The Assistant V.C. for External Cooperation also shed light on academic relations between SQU and several regional and international universities, and scientific and research centers. She also stressed the importance of research and scientific collaborations in the different scientific fields that meet the objectives the university aims to accomplish.

The delegation paid tribute to the university’s achievements, scientific and research centers as well as its different activities. The delegation also highlighted their academic and scientific programs and discussed ways of cooperation in a number of scientific and research projects. At the end of their visit program, the delegation visited the Sultan Qaboos Cultural Center where they were briefed about the Main Library and its main sections, the services offered, as well as the new systems used for research, borrowing, and documentation.

SQU Innovation Affairs Officials Meet ITA and IIC functionaries

The Innovation Affairs Department at SQU held a meeting with Information Technology Authority (ITA) recently with the aim of introducing the Innovation Affairs Department as a technology transfer office which link the research output of the university to the community; and exploring possible collaboration opportunities with ITA and SQU in order to promote the innovation culture among SQU community. The meeting was attended by Sheikha Al Akhzami, Director (In-Charge), Innovation Affairs Department, SQU, Maha Al Bulushi, Projects Specialist, ITA, and Rajalakshmi, Business Development Specialist, ITA.

The meeting was successful in giving orientation to the Innovation & Entrepreneurship Initiative by the ITA. This program will act as a coordination program with different stakeholders toward building knowledge economy for Oman. SQU as a main resource of knowledge is the core part of the initiative activities. ITA will play an important role in funding this initiative by providing incubators and consultancies for the selected innovation projects from academia. ITA will mainly coordinate, license and facilitate the commercialization of such projects. The meeting also discussed the E-Youth program by the ITA. It’s a competition among third, fourth and fifth year students from different fields for their research projects which uses the information and communication technology features.

Meanwhile, the Innovation Affairs Department also held a meeting with the Industrial Innovation Center (IIC) recently. The purpose of the meeting was to follow up the on-going research projects sponsored by the IIC with different companies from the industrial estates and the university; explore new opportunities for potential research projects with the industry; and discuss drafting the master agreement between SQU and the IIC. Dr. Abdullah Al Zakwani, Director, led the IIC team during the meeting whereas Sheikha Al Akhzami coordinated the SQU team.

Since last year, 13 research projects are currently running in three applied colleges at SQU with IIC sponsorship or being negotiated with the Centre. The projects are in the food industry, agricultural products, electrical engineering, geology and others. Dr. Tasneem Parvez, Dr. Alia al Ansari, and Dr. Michel Claereboudt, Assistant Deans for Postgraduate Studies & Research in the colleges of Engineering, Science, and Agricultural & Marine Sciences respectively, have been designated as Technology Transfer Agents by IIC who will be facilitating the link between SQU and the industry.

Laterite Deposits in Oman

Sultan Qaboos University conducted a comprehensive study of laterite deposits in Oman. The project, launched by Dr. Salah al-Khirbash, at Earth Science Department, College of Science, focused on four areas through several field trips. These are Ibra (1 profile), East Ibra, al-Russayl and Tiwi. The Sultanate is characterized with a unique geological variation dating back to about 800 million years, says Dr. Khirbash. In most areas of Oman, a period of weathering under most tropical conditions produced deposits with nickel and cobalt.

Laterites are the products of intensive and long lasting tropical rock weathering which is intensified by high rainfall and elevated temperatures. They are an important source of many metal ores, particularly nickel, cobalt, manganese, iron and aluminum. As to their geographical distribution, Dr. Khirbash explains that laterites mainly occur within a belt bounded approximately by latitudes 22°N and S, normally associated with active Cretaceous to Late Tertiary plate collision zones (Indonesia, the Philippines, New Caledonia and Oman).

As to the economic value of the laterite soil and rocks, Dr. Khirbash points out that the nickel laterites host most of the world’s terrestrial nickel resources, comprising about 40 per cent of the world’s nickel production, and constitute 70 per cent of the continental resources. His work was aimed at examining the geological and geochemical evolution of the four lateritic areas in the Oman Mountains and assessing their economic potentials.

The overall findings suggest that the laterites bear similar geological, mineralogical, and geochemical characteristics to many world nickel bearing laterites. This is extremely encouraging further research as to evaluating the main nickel bearing minerals and estimating their grade and tonnage for economic purposes, Dr Khirbash concludes.
The Electron Microscopy Unit established in the College of Medicine and Health Sciences at SQU offers diagnostic, teaching and technical support and state-of-the-art equipment to patients, faculty, staff and students of SQU and SQU Hospital. This Unit was formally inaugurated by the Minister of Health recently. Electron Microscopy Unit staff provides technical service for diagnostic service, teaching, student projects, academic research and training. Technical assistance is available for research and development on and off campus.

It offers wide range of services including: ultra structural examination of tissues and cells (TEM) and their outer surface ultra structure (SEM), qualitative and quantitative elemental analysis using energy dispersive x-ray spectroscopy (EDS), crystallographic information (electron diffraction), electron energy loss spectroscopy (EELS), electron tomography (3D), electron holligraphy and image analysis (mapping). The EM Unit also provides services for the preparation and examination of medical, biological and material science samples for transmission electron microscopy (TEM) and scanning electron microscopy (SEM).

The EM Unit at COM & HS is equipped with three TEMs, one low vacuum SEM and complete set of sample preparation for medical, biological and materials investigations.

Recently a new state-of-the-art High Resolution Field Emission 200kV Analytical TEM (JEOL JEM-2100F) was introduced to the EM Unit. This system is unique in the Gulf and Arab Region and India for its many systems, including: TEM, STEM, ASID, EELS, EDS, Electron Tomography, Electron Holography, Electron Diffraction, HR and HC Digital Imaging Systems. The JEM-2100 has a resolution of 0.1 lattice image, and 0.19 point-to-point image, with magnifications of X90,000,000 using STEM mode and X160,000,000 using TEM mode.

Applications of Field Emission Transmission Electron Microscope

The 200kV Field Emission Transmission Electron Microscope is scientific equipment used for diagnosis, research, teaching, industry and consultancy in medical, health, biological and material science applications. This instrument is capable of simplifying atomic level structural analyses in biology, medicine, and materials sciences as well as the semiconductor and pharmaceutical industries.

Medical, Health and Life Sciences

Allow understanding of cells, proteins, DNA, and drug interactions.

Allow researchers to directly visualize cellular structures, viruses and individual proteins

Investigate the surface topography of cells and isolated macromolecules, and provide insight into the dynamics of living proteins at sub-nanometer resolution.

Provide high resolution, three-dimensional images of structural details.

Materials Science Applications

Allow understanding of materials structure and properties, and the bonding between atoms.

Used in the characterization of materials.

Study variations in specimen temperature and ambient gas pressure, specimen straining, and changes in electrical bias or magnetic field.

Hard, soft, magnetic, frozen, and composite materials can easily be examined.

Nanotechnology Applications

Nanotechnology applications is multidisciplinary in nature, which covers a vast and diverse array of devices derived from engineering, biology, physics and chemistry. These devices include nanovectors for the targeted delivery of anticancer drugs and imaging contrast agents. Nanowires and nanocantilever arrays are among the leading approaches under development for the early detection of precancerous and malignant lesions from biological fluids. These and other nanodevices can provide essential breakthroughs in the fight against cancer.

Nanomaterials Applications

Used in all areas of biological and biomedical investigations because of its ability to view the finest cell structures.

Used as a diagnostic tool in hospital pathology labs for high resolution investigations such as immunoelectron microscopy.

Used in failure analysis, forensic and environmental labs

For the crystallography, metallurgy or semiconductor research, Field Emission TEM permits the routine imaging of atoms, allowing materials researchers to monitor and design materials with custom-tailored properties.

With the addition of energy dispersive X-ray analysis (EDS) or energy loss spectrometry (EELS), the TEM can also be used as an elemental analysis tool, capable of identifying the elements in areas less than 0.5µm in diameter.

Life Science Applications

Observe 3-D protein structures; internal structures of cells; and, 3-D reconstruction of virus particles.

C-IT / Semiconductor Applications

Particle analysis and surface analysis.

Environmental Applications

Analysis of dusts and catalysts; analysis of corrosive materials; analysis of contaminants; and water purification.

Semiconductor Applications

Semiconductor fabrication.

Quality Control

Useful in pharmaceutical industry for the detection of contaminants such as natural and synthetic fibers prior to commercialisation. Microscopically examination coupled with sample isolation, preparation, and analytical methods optimized for small particles, used to identify contaminations.

Scientific / Academic Research

The Electron Microscopy Unit facility is useful in molecular and structural biology research to help study proteins and genetic material. Immunogold labeling technique is used to localize proteins within cells and organelles. It is a powerful tool in the structural investigation of large biological complexes. Technique involves reconstruction of macromolecular complexes (using Cryo-EM & Electron Tomography).
Dr. Ann M. Mitchell is Associate Professor of Nursing and Psychiatry in the Health and Community Systems Department, School of Nursing and the Department of Psychiatry, School of Medicine at the University of Pittsburgh in the United States. She currently teaches psychiatric mental health nursing in both the undergraduate and graduate programs and offers a multidisciplinary Contemporary Issues in Cross-Culture Healthcare course which is open to all students at the University. Her scholarly research interests include grief and bereavement following sudden, unnatural deaths by suicide; complicated grief; and mental health outcomes research.

Dr. Ann has received the Cameos of Caring Award for excellence in teaching from the University of Pittsburgh School of Nursing; the Nurse as Global Citizen Award for her scholarly international work from the Pennsylvania State Nurses Association; and most recently, has been inducted as a Fellow in the American Academy of Nursing. Currently, Dr. Ann is a Fulbright Scholar, 2010-2011 and is assisting in an assessment and audit of the nursing student’s Final Exit Examination at the College of Nursing at SQU.

Horizon: Could you briefly explain how you came to be associated with the College of Nursing at SQU?

Dr. Ann: My association with the now, College of Nursing (CON) started a few years ago while it was still a Nursing Program within the College of Medicine and Health Sciences. At that time, I was invited to visit SQU as an international External Examiner for the final year exit examinations for the nursing graduates. In the United States, we have the NCLEX (National Council Licensure Examination) which is an examination for the licensing of registered nurses and vocational or practical nurses in the United States. These exams are designed to test the knowledge, skills, and abilities deemed essential to the safe and effective practice of nursing at the entry-level (after graduation). In Oman there is no such examination, but at SQU there is an excellent process in place to evaluate the professional competencies of its nursing graduates. The Final Exit Examination at the completion of the student’s undergraduate course work is composed of a multi-approach testing process. First the students must pass a comprehensive, multiple-choice question exam which covers content from the entire curriculum. The CON then invites international nursing experts from across the world, which together with local examiners; assess the students for skill acquisition and clinical competence at the bedside. And lastly, the examination committees then assess the student’s ability to integrate and synthesize their nursing knowledge through a series of oral exams.

It was because of my international scholarly interests and my experiences as one of the External Examiners that I spoke with the senior officials of the CON, including Dr. Bazdawi and Dr. Shukri, about how worthwhile it would be to evaluate the full student examination process. My work is now supported by the Fulbright Scholars Program for 2010-2011. Currently I am examining what happens both within each of the committees and then across or between the committees. We are also looking at student and alumni satisfaction as well as student preceptor and employer ratings of nursing competencies. This has been a fascinating experience and my stay in Oman has had a profound effect on me personally.

Horizon: Are you applying internationally accepted standards in the evaluation process?

Dr. Ann: The purpose of ensuring competence in nursing is for primarily, the protection of the public and secondarily, the advancement of the profession of nursing. The assessment of nursing competency is a complex undertaking and a shared responsibility of nursing schools, the profession, regulatory organizations, workplaces, and individual nurses. In America, guidelines for nursing program goals and core competencies have been established by the American Association of Colleges of Nursing (AACN) and are delineated in a document entitled The Essentials of Baccalaureate Education for Professional Nursing Practice. The CON’s curriculum is based upon this document and has developed associated expected program outcomes. We want to ensure the equivalency of the examination committees so that all students undergo the same evaluation process.

Horizon: We understand that In the U.S. you have done a number of studies related to family and friends who survive the death of a significant other by suicide, as well as looking at nurses’ attitudes toward the death of a patient for whom they have cared. Could you please tell us a little more about this?

Dr. Ann: I became involved in the field of suicidology about twenty years ago while working as the Project Director on a grant that was examining the effectiveness of two different types of groups designed to help those bereaved by suicide who must cope with the death. It was during that time I thought there must be something we can do to help earlier in the bereavement process to assist with the stigma and overwhelming feelings associated with this type of death. I have been involved in many different aspects of grief and bereavement research ever since.

Horizon: Recently, you served as a coordinator, resource person, and presenter for an Evidence Based Practice (EBP) Workshop in nursing organized here at SQU’s CON. How would you describe the momentum of EBP in the nursing profession?

Dr. Ann: Evidence Based Practice (EBP) is the conscientious, explicit, and judicious use of the current best evidence to make decisions and inform practice in order to ensure efficient and effective care. EBP is now recognized as the gold standard for implementing clinical decision making and delivering high quality patient care. Organizations and educators must ensure that health care professionals and students develop and maintain proficiency in EBP as a core competency. It was an exciting opportunity to collaborate with colleagues from the College of Medicine to organize the EBP Workshop designed to assist the nursing faculty in integrating EBP principles and practices throughout the nursing curriculum. This experience was one of my academic highlights while here in Oman.