NEWS & VIEWS

Sub-Continent's Longest Cave

The longest cave in the Indian sub-continent, the 6381 metre 'kerm um lawan,' has been discovered at Lumshong in the Jaintia hills of Meghalaya (India).

This cave has also the distinction of being the deepest in the sub-continent with a surveyed depth of 106.8 meters according to secretary of the Meghalaya Adventure Association (MAA) which conducted a joint expedition of the cave with a German team in March 1996.

Located in an area criss-crossed by several other caves, the 'krem um lawan' could be connected to the nearby 3650-metre 'krem kotsati' and other forming a single large cave system.

This cave comprises an upper fossil passage and a lower active passage of the Eocene age. The entrance has a flat ceiling and a number of cataracts and water falls. It has three different entrances and two rift spots. The Meghalaya Tourism Department had also started promoting the caves for the adventure tourist. Information about the caves would be put in the Internet.

There are about 200 caves in Meghalaya and only 50 of them have so far been surveyed. There could be more caves in the State which may turn out to be much longer than the 'kerm um lawan'.

-Excerpts from the News,
The Hindustan Times, Nov.20,1996

Use of swellex bolt as rock reinforcement in Uri Project, J&K, India

In Uri Hydroelectric Project, J&K (INDIA) where civil works are almost complete, a 10.4 km. long headrace tunnel and 2 km long tailrace tunnel in addition to many other access tunnel/adits have been driven. In rock class I and II which range from blocky rock mass to jointed, fractured or thinly foliated rock mass of competent hard rock, swellex bolts of 3 to 4 m length, 41 mm dia and 2 mm thickness have been widely used as rock reinforcement in combination with shotcrete or steel fibre shotcrete.

The swellex bolts have been adopted as substitute of grouted bolts in these type of rocks. One of the advantage is that the time taken for complete installation of swellex bolt is approximately 5 to 10 minutes as compared to one week time taken by grouted bolts to set and this in turn enhances tunnelling progress. Swellex bolts expands in the drill holes on application of high pressure water and adopt its shape to the irregularities of the hole. The frictional and mechanical interlock developed over full length of bolt increases the strength of rock. In areas of tunnel, where heavy seepage conditions were met and it was quite impracticable to put grouted bolts, swellex bolts have been effectively used to provide temporary support to the rock since frictional resistance with rock offers immediate support and very short time is required for its installation.

- R.N. Mishra, Manager,
National Hydroelectric Power Corporation,
New Delhi., India

Mat that can make the desert bloom

The loss of land after it turns into desert can have drastic results; starving people, dying animals and turmoil for the survivors fighting for the remaining soil. A simple, lowcost and easily applied system that will show early results in restoring deserts has been developed in the UK.

Known as LandCover, the system is (a growing medium based on) a matrix that re-establishes agricultural growth on land otherwise regarded as useless. The matrix contains seed, fertiliser, pesticide and other agrochemicals at precisely the amounts required.

There is no waste and no over-treating with chemicals that are expensive and potentially harmful if not handled proprerly. The LandCover method consists of highly absorbent bulk wood-pulp material in a lattice form to minimize wind resistance. It is ultra water-absorbent and easily handled, even by workers with no mechanical aids.

The greatest benefits of LandCover are the preapplication of essential agro-chemicals in exact amounts that are not wasteful or polluting, as well as the selection and planting of the very best and most robust seeds, leading to the establishment of healthy plants on arid or semi-arid soil.

The matrix is supplied in rolls, one kilometer in length and 10 m wide. Besides its use in extreme circumstances, LandCover can be used in horticultture, road-side planting, sports facilities, etc. where land recovery is needed urgently.

-Technorama 43, The Indian Express, Jan. 97.

Some important lessons for a design engineer involved in mining and tunnelling

* Mining and tunnelling have moved from an art into an engineering science as the complexity of projects increased and engineering has been transformed from an empirical art to a profession.

* The great advances made were due to a team efforts but often depended on the initiative of a single man.

* The engineer's ingenuity has been amply demonstrated but there is a tremendous potential for further improvement and innovation.

* A designer must be aware of the social and environmental factors of his engineering activities.

- Z.T. Bieniawski, 1984.

Rockmass weaknesses *(A challenge for Dam and Foundation Engineers)*

The significance of rock in dam and foundation engineering comes to the fore from the fact that more than 80% of failures of massive dams are attributable to insufficient or incompetent strength of the rock, and/or deficient laying of foundations of such structures.

The rock should be accepted by the engineer as given by Mother Nature in its natural state with all of its own weaknesses, as determined by stratification, cracks, fissures and other mechanical rock defects, weathering, and the like. Of course, if economically and technically feasible, the strength properties of the rock can be improved, thus increasing the stability of the dam or foundation or underground opening, whichever the case may be.

Formostly, it is the macroscopic structural anisotropy of the rocks, as governed by stratification, fissuring, and jointing, which frequently causes considerable deformations of the underground rock, but for which the analytical comprehensions is not statisfactorily possible as yet.

Based on what was said above, let us fix a mental picture of a water impounding concrete dam founded on or in a rock. A dam (barrage) and its supporting rock should form a static, integral unit; i.e., a barrage should be united with its supporting rock by a "solid marriage". Unfortunately, however, it usually turns out to be an unequal marriage because :

She, Whose name is Madame Gracia Archy Barrage, is young, formfit, graceful and beautiful in shape.

He, whose name is Senor Rock, is usually age-old and weathered.

She : Smooth, slender, well-built, and of good-looking stature.

He : His interior is disturbed by technique processes in the past; his face is creased and deeply furrowed by chasms, caverns, cracks, and fissure wrinkles, or swollen up with folds.

She : Is getting quickly tall and strong (grown-up) and lives frequently on a large pedestal; and according to the opinions of geotechnical engineers and concrete technologists, the finest for her is just good enough.

He : Upon him rests all the applied loads. He bears them patiently, and fortunately for him, he is smarter than all the calculations and analysis, and he knows how to help himself (visualize stress distribution in rock). However, if the rock is weak, it may be given antiweakness medicine injection (such as grout curtain). If in spite of this "medical help" the Rock constitution loses his internal balance (equilibrium), the rock simply breaks, rupture he is finished. Subsequently, and tragically, she also, Madame Barrage, loses her existence.

Nowadays, earth and the concrete dams become higher, longer, bigger, thus increasing in their weight. And so increase, also, the forces which are transmitted into the underground. Over and above this, engineers are faced with the necessity to select and adopt more unfavourable construction sites because most of the best sites have been build up already. Therefore, an analytical treatment of stresses in

the underground rock medium, a technological stress measurement in situ, and testing of rock strength have become now, more and more an urgent necessity than before.

-Alfreds R. Jumikis, 1983

Tachyon behind rejuvenating power of Pyramid houses

Faster than the light particles, tachyons (Pran) form the organizing energy field behind the worlds of spirit, mind and matter. The observed advantages of pyramid (house, roof, tent, cap, temples etc.) suggests that it intensifies tachyon field near its centre. Thus one's spirit, mind and body experience rejuvenation when one meditates or sleeps in the central part of the pyramid base. (In India, Osho commune has four houses with pyramid roof and small pyramids within for deep trance of the mind or realization of centre of bliss within with the help of elevated souls).

This experience suggests that roof of future buildings should be of pyramid shape with windows and a diagonal towards magnetic north. Food tastes a whole lot better inside the pyramid. Creativity is greatly enhanced because of better concentration of mind and elevation of the soul to the higher levels inside the pyramid houses. The probability of success is high particularly for those having subtle but receptive mind like child. This success justifies architectural design of housing and community centres which should be feasible in towns and rural areas. Let us harness tachyon energy for good of the life on the earth.

-Dr. Bill Shull Ed Pettit (1986),
Authors of Pyramid Power A New Reality

Address by Dr. Nick Barton, Norwegian Geotechnical Institute

Mr. Reiderleim is a father figure for me and was the father figure to me when I first arrived in NGI 25 years ago and he is as most of you know is the key author of Q-system. I only sort of reinducted the numbers and he told me to find out whether they made any sense. We started with just two parameters RQD and Jn and we had to keep on adding these. Definitely without Reiderleim's experience the Q-system would not have survived the 20 year of its use and perhaps we would not be here in CSMRS today. He took me to various tunnel sites and we who are older practitioners should do the same as we did that in taking promising young engineers with us when we visit tunnel or project sites and they should be asked to do hard work when we get back home

Let us acknowledge the days when research funds were easy to come by and we hope we can give the same freedom to researchers as we had 20 - 30 years ago.

- Excerpts, Conference on Recent Advances in Tunnelling Technology, 18 to 20 March, 1996, New Delhi,

Need of Underground storage for Petroleum and its products

The oil shock of 1973 followed by another shock of 1979 and the recent Iraq crisis forced the oil importing countries specially the oil importing developing countries to rethink and revise their strategy to ensure the continuous availability of crude oil and products on a long-term basis.

In India the widening gap between indigenous availability and demand of pertroleum products and the peculiar situation in which India is placed, the need for creating strategic reserves assumes greater importance. To address the problem Central Mining Research Institute (CMRI) of Council of Scientific & Industrial Research (CSIR) organised a four days National meet on Underground Storage of Oil, LPG and other Petroleum products from 27th Oct. to 30th Oct., 1996 at Mussoorie, U.P., India.

The participants of the course were of the firm opinion that (i) there is an urgent need to create strategic storage facilities for crude oil and petroleum products including LPG in the country; and (ii) CMRI as the leading premier Institute of CSIR involved in the mining research in the country since 1956, during the last ten years has developed the expertise and competence in identification of suitable underground storage sites including study of broad technological and economic aspects of underground storage.

As a result of intensive discussions during the programme, it emerged that the underground storage facilities of crude oil and products need to be created both for operational and strategic needs. There is therefore need to identify :

(a) Possible geo-feasible locations including already proposed sites.

(b) A time frame to achieve the basic concept to this National need together with budget estimates.

(c) Identify the agency who will support the extension of the basic initial work already done by CMRI in this area and suggest possible area technological tie-ups in achieving such a goal.

- *Excerpts of the Recommendations, National Course on Underground storage of oil, LPG and other pertroleum products, Oct. 30, 1996, Mussoorie U.P., India.*

The fight against hunger and Vitamin deficiency

People need not be hungry and the 750 million men, women and children who go without enough to eat each day, mainly in developing countries, can be greatly reduced in number by attacking the poverty which is the main cause of their hunger, says a new World Bank report.

The report points out that even if all developing countries grew as fast as East Asia in the 1980s, "there would still be hundreds of millions of hungry people.

Most effective actions include :

* Reducing vitamin A, iodine and iron deficiencies which have been shown to lower resistance to disease, cause mental retardation, cut productivity.

* Rectifying vitamin A, iodine and iron deficiencies, for example, would cost just $ 1 per person per year. Yet, said David de Ferranti, director of the Bank' Population, Health and Nutrition department, "no one knew that five years ago".

- Excerpts from the News, The Indian Express, Spring 1996.

Vitamins and minerals as therapy

In recent years taking megadoses (amounts that considerably exceed the U.S. RDAs) of certain vitamins and minerals has become popular, both to enhance general health and to treat specific illnesses. Nobel laureate Linus Pauling, perhaps best known for his theories on vitamin C and the common cold, is among the advocates of megavitamin therapy.

Many of Pauling's ideas have focused on vitamin C, and its use in combating not just colds, but a number of common diseases. He explains that while most mammals manufacture their own vitamin C, humans cannot and are therefore dependent upon food sources. According to Pauling, our dietary sources do not supply nearly enough to ensure optimal health, which, he contends, is not simply the absence of disease, but a state of mental and physical well-being.

An antioxidant, vitamin C may prove useful in preventing certain cancers, as well as in protecting the body against the harmful effects of pollution, smoking and radiation therapy. The vitamin is also being studied for its possible role in improving immune function. Some research indicates a possible role for vitamin C in the treatment or prevention of cardiovascular disease, diabetes, gallstones, eye diseases, viral and bacterial infections, mental disorders, asthma, allergies, and spinal-disc degeneration. Natural practitioners often give vitamin C supplements to aid in wound healing and increase resistance to stress (Rock engineers generally take 500mg vitamine C tablet about a week in advance before going to sites for enhancing their immunity and avoiding sickness effectively).

- Excerpts from the Article
published in Reader Digest;
Family Guide to Natural Medicine.

Science sees body clock in new light

Researchers say they have found that normal levels of indoor lighting, and not just very bright light, can reset the human biological clock, a finding they say that indicates that many people in the industrialised countries may be constantly sleep-deprived and in a permanent state of jet lag. The widespread availability of electricity and light bulbs has provided most people with enough extra light exposure each day to significantly shift the timing of their internal clocks, which govern sleep and restfulness, among other things.

In a report published in the journal Nature, Dr. Czeisler, Dr. Diane B Boivin and colleagues said that exposure to relatively low-light intensity from artificial lamps for as little as five hours could reset the biological clock, also known as the cicardian pacemaker. Circadian rhythms affect not only the sleep-wake cycle, but also alertness, body temperature and the secretion of hormones that govern many aspects of metabolism. This 24-hour clock, which resets itself each day during sleep, also affects a psychological condition, seasonal effective disorder, or winter depression, which afflicts some people when exposure to day light is reduced.

Exposure to artificial light after sunset in industrial countries has shifted the clocks of most people by four to five hours, Dr. Czeisler said, meaning the most people in the United States are actually on Hawaii time. Instead of people experiencing a peak drive for sleep at between midnight and 1 AM, for most people this is now 4 or 5 AM, he said, meaning that most people are forced to wake up earlier than they want to and remain tired during the day.

The researcher said that people might be able to minimise or control these effects by going to bed at the same time each night, even on weekends, getting a full eight hours of sleep each night, reducing their exposure to artificial light before bedtime, and not sleeping with lights on (this is one of the first steps in Yoga called Niyam).

- Excerpts from the News,
The Time of India Feb. 13, 1996.

The video-teleconferencing facility to be launched in 150 institutions

The All India Council for Technical Education (AICTE) would introduce distance education in computers, telematics and other emerging areas through video-teleconferencing according to AICTE chairman Prof. Rame Gowda. Inaugurating a two-day seminar on "Engineering Education in the 21st Century", organised by the Indian National Academy of Engineering and sponsored by AICTE and the Indian Institute of Technology (IIT), Chennai, Gowda said this facility would be introduced in 100-150 institutions in the country.

The system would be an interactive process through the VSAT (Very Small Aperture Terminal) and would create a "virtual class room" where students can listen to lectures by competent professors from some of the best universities in the world. The lectures would be printed and provided to students as back-up material.

He pointed out that science was growing at a very fast rate, thereby accelerating the rate of obsolescence. By the time an engineering student finished his course, a certain portion of what he had learnt would have already become obsolete. A standard syllabus should be worked out whereby the student is exposed to the basic principles of mathematics, physics and biological sciences. The course should at best enable him to "learn to learn".

- Excerpts from the News,
The Indian Express, Jan. 19, 1997

Counting sheep may not help insomniacs

If a person gets enough hours of sleep, yet keeps dozing off on his office-desk or car steering, he might be suffering from apnoea-a sleeping disorder which might prove dangerous.

Apnoea, is a state when breath stops for about 10 seconds a number of times during the sleep. The oxygen supply to the brain is, thus, curtailed depriving the body of the benefits of a good sleep. The body, thus, seeks to compensate for the lost sleep during the day, according to experts at the first two-day international symposium and workshop on sleep disorders. Sleeping for less than five hours or more than nine also reduces life expectancy, said Anwant Chawla, Medical Director of Sleep Disorder Centre at North Shore Regional Hospital, Lousiana in United States.

In many cases, an apnoea affected person may suddenly doze off on steering wheels and meet with an accident. In the West, apnoea husbands, who also snore, have been taken to court for divorce by their wives. Hospital, not the court, would be the right place to take the husband to, felt experts at the workshop. "There is a need to spread awareness about sleep disorders among the people as well as doctors" said J C Suri, founder president of Indian Sleep Disorder Association and head of sleep medicine department at Safdarjung Hospital, New Delhi.

Insomnia is another common sleep-related disorder affecting nearly one-third of adult population. Individuals aged 18 to 30 have trouble falling sleep. It often entails early awakening and day time sleepiness among these. Those over 45 have trouble staying asleep. Insomnia is more common among those suffering from anxiety and depression.

Counting sheeps doesn't help, points Dr. Chawla, nor does lying longer in the bed and trying harder. He suggests some sleep hygiene rules :

- stick to a regular sleeping and waking schedule.
- naps: be consistent. Take one every afternoon, or none at all.
- exercise regularly - morning or early afternoon. But not before bed-time.
- no caffeinated beverages after 4 pm.
- Avoid alchohol after dinner.
- limit the use of sleeping pills.

- find the right room temperature for you.
- try to relax before going to bed.
- bed room should be dark and relatively free from noise.
- do not eat heavy meal just before bed-time.
- go to bed when you are tired. Do not force yourself to sleep.

- Excerpts from the News
The Times of India,
March 7, 1996

Former ISRM President Prof. Charles Fairhurst Honoured

Prof. Charles Fairhurst, Former President, International Society for Rock Mechanics received honorary doctorate from Institut National Polytechnic de Lorraine (INPL), France, in ceremonies in Nancy, October 10, 1996. Professor Fairhurst was one of eight individuals in various academic fields to recieve the degree of "Docteur Honoris Causa" of INPL. Professor Fairhurst was honoured for his life long contributions to the field of Rock Mechanics, and was introduced by Professor Francoise Homand, Ecole de Geologie and Professor Jack Piguet, Ecole des Mines, Nancy.

- ISRM News Journal,
Vol. 4, No.2, 1997.