

## SCIENCE AND TECHNOLOGY NEWS

### NATIONAL NATURE-CONSERVATION ZONE FOR THE YARLUNG ZANGBO GRAND CANYON

Master Plan of Yarlung Zangbo Grand Canyon National Nature-Conservation Zone has recently passed the approval check of experts from Chinese Academy of Sciences. As a result, a national nature conservation zone will be created in the Canyon.

The nature-conservation zone in the plan will be located in the southeast section of Tibet, with a total area of 9600 Km<sup>2</sup> and a population of 14,900. During the period from October 19 to December 10, 1998, a scientific expedition team, composed of over 60 scientists from diversified disciplines such as geology, geography, atmospheric physics, botany and zoology, had successfully walked through the Canyon for the first time. Through this unprecedented expedition, scientists have found that the maximum height of the peaks standing at the sides of the Canyon reached over 7700 meters, the sea level of the river 2000 meters or lower, at 400 or 500 meters in some areas, registered a world record of height-difference by 5000 meters. The Yarlung Zangbo Canyon has been officially confirmed as the largest of its kind in the world.

The Canyon has rich geological and natural landscapes, with four huge falls running through the trunks of the Yarlung Zangbo River. The Canyon's unique geological and climatic features have bred its unique ecological system and rich flora and fauna resources with many rare plants, animals and insects. So far more than 3000 plants have been classified as higher plants and more than 40 species as rare animals under national protection. Sitting at the northeast corner of Indian and Eurasian plates, the Canyon has been given honourable names, such as "natural museum of biological resources", "genetic bank of biological resources" and "geological museum".

The Master Plan has outlined comprehensive measures protecting flora and fauna and geological characteristics in the Canyon and made the divisions of conservation areas and species under protection. It is also reported that to tap the rich water-resources in the Canyon on a rational basis, the concerned authorities will establish a hydraulic observation

station in the Canyon, so as to prepare for the future power generation at the Yarlung Zangbo River.

### CHINA'S SOPHISTICATED BURN-TREATMENT TECHNIQUES

Humid ointment representing the world's advanced techniques for burn treatment, was officially approved (approval file number: Z20000004) by China State Pharmaceutical Supervision Administrator for mass production. This has demonstrated China's world advanced level in burn treatment and its potential contributions to the world's people, through research results of series products.

At present, the improvement of traditional burn-treatment approaches has become a dominant trend. As a result, biomedical communities, businesses and governments in many countries have invested huge resources in seeking for fetus-like no-scar treatment result through taking advantage of the latest technical means and man's own physiological skin-repair functions. Self repair oriented burn-treatment has become popular in the area.

The so-called humid therapy, invented by Prof. Xu Rongxiang, China Burn Injury Treatment Centre, is an innovative burn-treatment system. His representative technique (MEBT) and products (MEBO) have successfully handled four major clinical difficulties, such as wound pain, infection, progressive necrosis and scar-healing of grade II burns. His products have monopolized the market for a decade. When the western world invested huge resources in studying physiological self skin repair techniques and associated products, China's burn treatment techniques have already achieved attractive clinical results.

It took a decade for Prof. Xu Rongxiang to achieve fine results from his studies of skin-cloning and he has successfully applied his research-results in self skin-repair therapy for patients with large burn wounds. In his studies of anti-infection treatment of extensive and deepened burns, he has worked out new anti-infection approaches humoring the ecological conditions and structures of microbes, rather than using bacteria killing or oppression techniques, and achieved clinical success for extensive burns. It is important to note that humid

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therapy invented by Prof. Xu is still in the process of diffusion and improvement. It is reported that the blue book on burn-treatment techniques, to be published by China Association of Chinese Traditional and Western Medical Sciences, will reveal a number of completely new research results on self skin repair therapy.

*(Courtesy: China Science and Technology, Newsletter No. 216, March 10, 2000)*

### THE SMALLEST HELICOPTER IN THE WORLD

Developed by Shanghai Jiaotong University, a mini-helicopter, which is able to take off and land on a spot of only two peanuts size, made its debut in Shanghai. Being the smallest and lightest helicopter in the world, the dual-propeller flying machine has a length of only 18 mm, height of 5 mm and weight of 100 mg. When the rotation speed reaches 21,000 per minute, the helicopter body will be trembling up into the air.

A year ago, a German company announced the birth of the world's smallest helicopter at that time with a length of 24mm, height of 8 mm and weight of 400 mg.

As briefed by researchers, the smaller the length and the lighter the weight of the helicopter, the wider applications it can find. Manufacturing the mini-helicopter has covered high technologies in a variety of fields such as special materials, mini-mechanical processing, electronics, air dynamics and others, and is of great difficulty.

*(Courtesy: China Science and Technology, Newsletter No. 216, March 10, 2000)*

### CANCER PATIENTS NEED HEALTHY FOOD TO COMBAT SIDE-EFFECTS

A nutritious diet is always vital for your body to work at its best, but it is more important for people with cancer. Patients who eat well during their treatment are able to cope better with the side-effects of treatment. Patients who eat well may be able to handle a higher dose of certain treatments.

A healthy diet can help keep up your strength, prevent body-tissues from breaking down, and rebuild tissues

that cancer-treatment may harm.

When you are unable to eat enough food or the right kind of food, your body uses stored nutrients as a source of energy. As a result, your natural defenses are weaker and your body cannot fight infection as well. Yet, this defense system is especially important to you now, because cancer patients are often at risk of getting an infection.

A good rule to follow is to eat a variety of different foods everyday. No one food, or group of foods contains all of the nutrients you need. A diet to keep your body strong will include daily servings from these food groups:

*Fruits and Vegetables:* Raw or cooked vegetables, fruits, and fruit juices provide certain vitamins (such as A and C) and minerals the body needs.

*Protein Foods:* Protein helps your body heal itself and fight infection. Meat, fish, poultry, eggs, milk, yogurt, and cheese give you protein as well as many vitamins and minerals.

*Grains:* Grains, such as bread, pasta, rice, and cereals, provide a variety of carbohydrates and B vitamins. Carbohydrates provide a good source of energy, which the body needs to function well.

*Dairy Foods:* Milk and other dairy products provide protein and many vitamins, and are the best source of calcium.

Doctors know that patients who eat well during cancer treatment are better able to cope with side-effects. However, there is no evidence that any special kind of diet or food can either cure cancer or stop it from coming back.

In fact, some diets may be harmful, especially those that don't include a variety of foods.

*(Courtesy: Daily Pakistan Observer, Monday, May 15, 2000)*

### SOYBEAN KEY TO A HEALTHY HEART

Soybean contains protein that may lower cholesterol levels, which can lead to a reduced risk of heart

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disease. Soy, as a component of Asian diets, has long been associated with a reduced risk of cardiovascular illness. More recently, the United States Food and Drug Administration has approved the labelling of soy- products as significant for cholesterol lowering.

Monash University's cardiovascular researchers lead the largest controlled trial performed to date of soy on the cardiovascular system. The study, on 220 men and women, confirms that soy lowers fatty lipids, including cholesterol. The study also discovered that soy may even help lower blood-pressure slightly.

The scientists believe that soy contain isoflavones, which are quite active ingredients. They are a sub-group of agents known as phytoestrogens: plant-based compounds that mimic the female hormone oestrogen, which is thought to provide a protective effect against heart-disease.

Isoflavones are found in soy as well as other foods, such as the plant red clover. Armed with this theory, the Baker Institute has carried out two studies on 50 women, using isoflavones extracted from red clover and from soy, or a placebo.

The Baker researchers, led by Professor Paul Nestel, found that women who took isoflavones had significantly improved elasticity of the arteries; equivalent to that experienced by women on hormone replacement therapy.

Separate research at the Baker Institute, by doctors Chin Disting and Krishna Sudhir, using a synthetic form of isoflavones, has shown improved artery-flow and prevention of early arterial atherosclerosis, the disorder causing heart attacks.

*(Courtesy: Daily Pakistan Observer, Monday, May 15, 2000)*

### **AEROBIC EXERCISE BENEFICIAL FOR ELDERS**

Vigorous aerobic exercise may be the best way to improve cardiovascular health of people who are in 60s and 70s age-groups.

In a study of 117 healthy men and women, aged 59 to 77, investigators found that the subjects' aerobic

capacity, rather than the number of calories they burned through exercise, was strongly linked to heart-disease risk.

The men and women who had the greatest aerobic capacity were leaner and had lower cholesterol and insulin levels compared with their peers, report Dr. Eric T. Poehlman, of the University of Vermont in Burlington, and colleagues, in the Journal of Clinical Endocrinology and Metabolism.

Those who were aerobically fit - a measure of the body's ability to transport and use oxygen - appeared to be at lower risk of heart-disease regardless of whether or not they exercised more or less than other study subjects. This, Poehlman said, suggests that bursts of exercise that get the heart and lungs working at peak capacity may benefit elder hearts more than frequent, moderate activity.

With a doctor's approval, he noted, some elderly people may be better off engaging in vigorous exercise. According to Poehlman and his colleagues, there has been considerable controversy about how much older men and women should exercise, and what types of activity they should engage in.

It has not been clear which is more important - aerobic fitness or calorie - burning exercise. The authors note that these two factors do not necessarily go hand-in-hand.

To directly compare the two factors, the researchers measured the subjects' aerobic capacity on a stationary bike and gauged their calorie-burning over 10 days. They also looked at participants' body composition and dietary intake over 3 days.

The men and women were then divided into groups based on high and low aerobic capacity, and high and low calorie-burning. Across all groups, the investigators found that participants' activity levels surpassed the general recommendation that older adults burn about 200 calories each day through exercise. Yet, only those with high aerobic capacity showed a reduction in many heart disease risk factors.

*(Courtesy: Daily Pakistan Observer, Sunday, April 16, 2000)*

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### AIDS VIRUS CAN HIDE IN 'T CELLS'

The Aids virus can hide in the body, immune to the most powerful drugs, making it likely that it will be many years before a cure is found. Research by microbiologists at the University of Minnesota shows that within three days of infection, the HIV virus can invade "resting T-cells".

Scientists are of the view "these cells are good hiding places because they are inactive and so ignored by the body's immune system. Neither can they be attacked by drugs, which need some kind of activity by the virus or the cells it infects in order to work. "No drug currently available could find the virus in its hiding place and kill it, the scientists added.

Ashley Haase, reporting the findings in the journal Science, said: "These cells fly below the radar screen of the immune system. They also live a long time and won't be affected by our current combination of anti-Aids drugs".

HIV causes illness by infecting immune-system cells, known as CD4 T-cells. When the virus gets inside, it take over a cell's machinery and makes it crank out copies, killing the cell. As long as this is happening the body's other immune-cells can detect the activity and attack, while drugs can stop various stages of the takeover process.

This explains why cocktails of HIV drugs can help to suppress the virus. But the research shows that HIV is also able to enter inactive or "resting" T-cells, which can exist in the body for years, even decades, without doing anything.

Mr. Haase's team, working on monkeys and later HIV patients, discovered that the virus can invade, within three days of infection, before symptoms are shown.

Dr. Anthony Fauci, head of the National Institute of Allergies and Infectious Diseases, said that the study helped to explain why people who took cocktails of drugs for years were not cured.

*(Courtesy: Daily Pakistan Observer, Wednesday, April 12, 2000)*

### HORMONE THERAPY INCREASES HEART-RISK

A latest study, involving thousands of postmenopausal women found that hormone-replacement therapy increases the risk of heart problem slightly, but the risk appears to fade after two years. The potential benefits and risks of taking estrogen as a hormone supplement have been examined repeatedly these last few years, with many studies indicating that estrogen improves memory, reduces the risk of heart-disease in pre-menopausal women, alleviates menopausal symptoms such as hot flushes, and lowers osteoporosis risk.

But high estrogen-levels have also been associated with breast cancer, and its effects on the heart in postmenopausal women have been unclear.

Preliminary findings from the federally funded Women's Health Initiative suggest postmenopausal women, taking estrogen during the first two years of treatment, face a slightly elevated risk for a heart attack, stroke or blood clot, compared to similar women taking a placebo. The study isn't scheduled to end until 2005, so researchers say that risk could change over time. Only 1 percent of the 27,000 women participating in this portion of the study suffered a heart attack, stroke or blood clot, although exact figures have not been released.

It's long been known that estrogen can raise the risk of blood clots, although there's been some question as to who is most at risk. Health experts caution that it's too early to use these findings as a basis for determining who should take estrogen, and that doctors and patients should make such decisions on an individual basis.

*(Courtesy: Daily Pakistan Observer, Tuesday, April 11, 2000)*

### IODINE DEFICIENCY AFFECTS INTELLIGENCE

Salt-iodization protects millions of new-born every year from a ten percent loss in learning ability. Iodine-deficiency affects intelligence and the ability to learn. It is the world's single greatest cause of preventable severe mental retardation, UNICEF Executive Director, Carol Bellamy, told participants at the opening ceremony of Salt 2000, the 8th World Salt

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Symposium at the Hague.

“Where populations are suffering from iodine-deficiency, average intelligence can spiral downwards by approximately ten IQ points”, Bellamy said. “This has serious implications, not only for individuals, but also for the social and economic development of entire nations”.

Bellamy praised the salt industry for its crucial role in salt-iodization and the key partners in the effort - international agencies, Kiwanis International, donor governments and NGO's.

Bellamy told the meeting that two major tasks remain to be accomplished. The first is to reach the 30 percent of the world's population that does not have access to iodized salt. The second is to sustain the progress already achieved.

“In many countries of Eastern Europe and the Commonwealth of Independent States, iodization-rates have dropped dramatically in recent years. This experience has taught us that we cannot be complacent. Iodine deficiency is an ever-present threat to the development of children”.

Bellamy called on the salt industry to support implementation of the iodization legislation - now on the books in most countries. She urged all producers to help improve the production, quality and availability of iodized salt in the developing world, through such initiatives as encouraging salt-production in developing countries.

*(Courtesy: Daily Pakistan Observer, Monday, May, 8, 2000)*

### HIGH LDL CAUSE OF HEART AILMENT

Blood cholesterol plays an important part in deciding a person's chance or risk of getting coronary heart disease. The higher your blood-cholesterol level, the greater your risk. Cholesterol is a waxy substance found in all parts of your body. It helps make cell membranes, some hormones, and vitamin D. Cholesterol comes from two sources: your body and the foods you eat. Blood cholesterol is made in the liver.

The liver makes all the cholesterol your body needs. Dietary cholesterol comes from animal foods, like meats, whole-milk dairy foods, egg yolks, poultry and fish. Eating too much dietary cholesterol can make your blood cholesterol go up. Foods from plants, like vegetables, fruits, grains and cereals do not have any dietary cholesterol.

Low-density lipoprotein (LDL) cholesterol or “bad” cholesterol carries most of the cholesterol in the blood, which leads to buildup of cholesterol in the arteries. High-density lipoprotein (HDL) - cholesterol or “good” cholesterol helps remove cholesterol from the blood and helps prevent the fatty buildup.

LDL narrows the arteries and can slow down or block blood-flow to the heart. With less blood, the heart gets less oxygen. With not enough oxygen to the heart, there may be chest pain (“angina” or “angina pectoris”), heart attack (“myocardial infarction”), or even death.

A high blood-cholesterol level is not the only thing that increases your chance of getting heart-disease; cigarette smoking, high blood pressure, diabetes, obesity/over-weight, physical inactivity are other elements. Beside these, the uncontrollable factors: 45 years or older for men, 55 years or older for women, family history of early heart disease (heart attack or sudden death) are also responsible.

Lowering cholesterol slows the fatty buildup in the arteries, and in some cases can help reduce the buildup already there. And, if you have two or more other risk factors for heart disease, or already have heart disease, you have a great deal to gain from lowering your high blood-cholesterol.

High intake of saturated fat, dietary cholesterol, and excess calories, leading to overweight, can increase blood cholesterol levels.

*(Courtesy: Daily Pakistan Observer, Tuesday, April, 4 2000)*

### TOMATOES MAY HALT CANCER PROGRESS

Tomatoes, which are already acknowledged to have a preventative action against cancer, may actually halt its progress, according to a leading specialist.



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The vegetable has been found to prevent the disease by providing high levels of lycopene, a powerful antioxidant, which is responsible for the red colour.

Dr. Venket Rao, professor of nutrition at the University of Toronto, found that breast and prostate cancer sufferers had low levels of lycopene. The 20 men and 18 women then drank 500 ml of tomato juice twice a day for a month and their lycopene levels, measured in blood and tissue, shot up.

Dr. Rao said that this indicated that the increased lycopene may slow down the progression of the tumours: people with cancer tend to have poor absorption of lycopene. He announced these and other findings at a conference at the Nutrition Food and Health Research Centre in Kings College, London. The professor said lycopene could be the "master switch" to diseases such as cancer and coronary heart problems. By giving excessive lycopene, doctors might be able to control the switch.

He said: "There is some evidence that lycopene not only plays a part in prevention but it can also slow the growth of a tumour. In addition to being preventative, it can be prophylactic. His findings were welcomed by nutritionists and horticulturalists, although cancer specialists warned that randomised clinical trials were needed to confirm Dr. Rao's analysis.

Prof. Gordon McVie, of the Cancer Research Campaign, who last year advised people to make one of their daily five portions of fruit and vegetables a tomato because of its protective qualities, said: "A lot of cancer lumps can consume nutrients, to the detriment of the rest of the body. You can eat what you like but the cancer gets it. Dr. Rao has shown that you can overcome that by raising lycopene levels".

But he cautioned that it could not be assumed that cancer would slow down if lots of tomatoes were consumed. He said: "There's some good circumstantial evidence, but it requires a very careful study. I don't think that primary schools should necessarily rush out and put tomatoes on the menu".

*(Courtesy: Daily Pakistan Observer, Monday, April, 3 2000)*

### CHOLESTEROL LEVEL HAS A LINK WITH GENES

One of the main reasons why some people's cholesterol levels are more responsive to dietary

changes than others: the answer appears to be in your genes.

According to the study, published in the American Journal of Clinical Nutrition, a group of northern Finns with a specific genetic makeup, called a genotype, showed much greater increases and decreases in LDL cholesterol levels, in response to diet than others without the genotype.

LDL is considered the "bad" type of cholesterol because it can build up on the walls of arteries that feed the heart and brain and cause clogging, or arterosclerosis. Should the buildup lead to a clot in an artery, the result can be either a heart attack or a stroke. There is also "good" cholesterol, called HDL, which is believed to actually help carry bad cholesterol from the liver, where it is passed from the body.

The genotype pinpointed in the study is related to a protein called apolipoprotein B, which plays an essential role in lipid transport and the way the body processes cholesterol. It is also associated with an increased risk of cardiovascular disease.

In studying the protein, researchers with the University of Oulu in Finland and the Hebrew University of Jerusalem screened the lipid-related phenotypes of 22 men and 22 women, all employees of a Finnish hospital who volunteered for the study. The subjects' cholesterol levels were then monitored for six months, during which time their diet was regulated to rotate from low-fat to high-fat at monthly intervals.

The results showed that participants with one genotype in particular, the "XX-" genotype, had the greatest increases in LDL cholesterol during the high-fat diet and the greatest decreases during the low-fat diet. Those with two other genotypes, "M+/M+" and "R-/R" also showed greater increases and decreases in cholesterol in relation to diet.

The American Heart Association (AHA) recommends that a desirable total cholesterol level is less than 200 milligrams per deciliter of blood. Cholesterol levels between 200 and 239 are considered a high-blood cholesterol level. The AHA recommends that HDL, or "good" cholesterol, levels be above 35 milligrams per deciliter.

*(Courtesy: Daily Pakistan Observer, Sunday, April, 9 2000)*

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### YOUTH EQUALLY PRONE TO CHOLESTEROL HAZARDS

Staying away from high-fat, high-cholesterol foods is not just a warning for adults to heed. A new study of teen-agers found that one-third of them had increased their heart-disease risk factors with junk food diets that could lead to high blood-pressure and clogged arteries, as they grow older.

The American College of Cardiology has published these findings in a recent report.

Researchers at the Pacific Health Education Centre in Bakersfield, California, and Prevention Concepts, evaluated the dietary habits and cardiac risk profiles of more than 200 high school students. More than 80 percent of them consumed higher than recommended levels of total and saturated fat, while dietary cholesterol was excessive in 49 percent.

Cholesterol levels were considered abnormally high for the age in one-third of the participants, and approximately one in 10 had systolic hypertension, a form of high blood-pressure.

To compare high-risk teens with their healthy counterparts, researchers used ultrasound to measure the thickness of the neck's primary artery, the carotid artery. Teenagers with the thickest artery walls were likely to be those who were overweight or had high blood pressure or high cholesterol - all common risk factors for heart-disease in adulthood. Thickening of the arteries is not dangerous in itself, but a build up of small fatty deposits can be an early indicator of arterosclerosis - an abnormal thickening of artery walls.

*(Courtesy: Daily Pakistan Observer, Friday, April, 7 2000)*

### 7TH INTERNATIONAL SYMPOSIUM ON ADVANCED MATERIALS (ISAM - 2001) ISLAMABAD, PAKISTAN 17-21 SEPTEMBER 2001

#### Scope of the Symposium

The 7th International Symposium on Advanced Materials (ISAM-2001) will be held in Islamabad, Pakistan, from 17-21 September 2001. This biennial event has become a popular and probably one of the prime international forums, at which materials-engineers and scientists can keep up-to-date with recent technologies concerning advanced structural and functional materials. Contributions are welcome

on the following topics:

#### TOPICS

**1. Production and Processing:** Melting and refining, near-net shape technology, sintering. Joining of materials. Physicochemical aspects of glass-ceramic-metal joints. Adhesive bonding. Evaluation of joints.

**2. Characterization and Quality Assurance:** Characterization techniques for special steels, super-alloys, nano-crystalline, light alloys piezoelectric, electronic, magnetic, optical and bio-medical materials, superconductors, ceramics, glasses, composites, polymers, etc. Thermo-mechanical treatments, phase transformations, texture analysis, destructive and non-destructive evaluation of materials.

**3. Materials Performance and Life Prediction:** Selection, compatibility and service behaviour of materials. Fracture, failure analysis, life prediction of structures, modeling, numerical techniques, material design and artificial intelligence.

**4. Surface Modifications and Degradation:** Shot peening, organic, thermal sprayed, optical and photo-conductive coatings. Erosion/wear-resistant coatings. Interaction of coatings with environments Thermodynamic aspects of corrosion, SCC, corrosion protection and hydrogen embrittlement.

#### Languages

English is the official language of the symposium

#### Deadlines

Submission of Abstract	February 28, 2001
Notification of acceptance	March 31, 2001
Submission of manuscript	May 31, 2001
Last date for registration	July 31, 2001

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