



VP News

Inside

Transit of Venus

The Transit of Venus took place on 8th June 2004 after a gap of 122 years. The rare celestial event was utilized by Vigyan Prasar as an opportunity to undertake large-scale science communication with a view to inculcate scientific temper among the masses, in particular among the school children. Vigyan Prasar developed, produced and disseminated a variety of software.



Venus Transit - Black Drop Effect as seen by Vigyan Prasar

The most popular and well appreciated was the Venus Transit activity kit consisting of 18 activities, a solar filter and colourful and information rich poster. Some 20,000 copies of the kit were sold and distributed all over the country. In addition, solar filters were sold separately in retail as well.

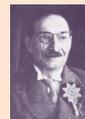
A book on Venus and its Transits authored by Professor S.P. Pandya, Professor J N Desai & Professor S.R. Shah was published in Hindi, English and Gujarati. Four special articles covering the transit, its history, about Sun and how it was utilized to measure the absolute value of AU were authored by Dr. V.B. Kamble and published in Dream-

2047. A multimedia CD containing Powerpoint slide presentation on Transit of Venus was developed in-house. The CD consisted of slide presentation on the themes; The Transit of Venus, In quest of Astronomical Unit, Venus Transit Expeditions, The Sun, Eye & Vision. The same was distributed to all the participants of four regional workshops organized jointly by VP & NCSTC. A multimedia CD on Transit of Venus was also produced containing exhaustive information on Venus and its Transits.

Visual medium was also maximally utilized. Two video films; one titled 'Transit of Venus' and the other 'In Quest of Astronomical Unit' were produced in Hindi. Besides, these video were telecast on Doordarshan, Gyan Darshan & Vyas (higher education) Channels. In collaboration with CPC, Doordarshan, a curtain raiser and two promos were produced and the same were telecast by DD National, DD News & DD Bharati on 7 June 2004. [contd on page... 19](#)

EDITORIAL

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... think scientifically, act scientifically... think scientifically, act scientifically... think scientifically, act...



Venus has its day

People all over the world watched Venus pass in front of the Sun on June 08, 2004. Indeed this was a much-awaited event that had not occurred for last 122 years - since December 06, 1882 to be precise. The entire transit was visible from Europe, the Middle East, and most of Africa and Asia. The Sun set while the transit was still in progress from Australia, Indonesia, Japan, Philippines, Korea, easternmost China and Southeast Asia. The Sun rose with the transit already in progress for observers in western Africa, eastern North America, the Caribbean and most of South America. The rest of the world was not fortunate enough to witness this celestial drama.

Despite the fact that the Sun was clouded out for some time in northern parts of the country, and the monsoon was active in the southern region, the transit was observed all over the country. The enthusiasm amongst the students and the general public to observe the rare phenomenon was phenomenal. Almost all observatories, science centres, planetaria, educational institutions and even individuals made arrangements to help people watch the celestial drama. What was most remarkable was the large number of people – scientists, students and the general public around the globe interested in observing the event. During the 18th and 19th centuries, it was mainly the scientists who could observe the transits. Telescopes were not easy to come by unlike today. However, this time millions witnessed the event live. Those unable to watch directly due to clouds or geography took advantage of broadcasts on television and the Internet. Many webcasts of the transit were unavailable or extremely slow due to heavy traffic (including that of Vigyan Prasar – we received many complaints that Vigyan Prasar website could not be accessed!). Several webcast sites were getting 1,500 hits per second!

Where was the black drop? While some reported having observed the black drop, many reported having not been able to observe it at all! The black-drop effect is seen when a dark patch appears to connect Venus with the dark sky past the edge of the Sun, sometimes giving Venus a teardrop shape. It was widely observed and commented on in the 18th and 19th centuries. Yet most observers didn't report seeing a black drop this time. Of those who did, most saw something much less pronounced than the effect observed in the past – so much less pronounced that they hesitated to call it a black drop at all. Photographs taken by Vigyan Prasar, however, do show the black drop effect! Even for those who did not observe the black drop effect, the timing of the second contact was difficult to pin down, giving a new appreciation for the difficulties encountered by our predecessors in timing the contact points during the 18th

and the 19th century transits. Opinions range as to why there is a discrepancy. The leading theory cites today's better telescope quality. Unusually good atmospheric seeing has also been suggested.

The efforts of Nehru Planetarium, New Delhi, in engaging a large number of students in scientific observations were noteworthy. They had even started a discussion group on the internet, where the amateur astronomers could exchange notes and discuss their preparations, equipment, techniques of observations and so on. Their main objective was to note the four contact timings, look for the black drop effect, and re-create the history in the 18th and 19th centuries. Other place of feverish student activity was at the Udaipur Solar Observatory. A group of some 80 school children from Meghalaya specially came to Udaipur for scientific observations under the guidance of scientists there and could manage to get a good set of observations thanks to the weather gods - it was sunny throughout the day!. Reports of observations by students have been pouring in at Vigyan Prasar from various planetaria and observatories in the country.

VP produced a variety of software on Venus Transit – resource articles, slide shows, an interactive CD-ROM, two TV programmes (which were telecast on several satellite channels), a book on Venus and its transits (in three languages), and a versatile activity kit. Vigyan Prasar even made available 360 telescopes for dissemination in schools of various States. The activity kit and the telescopes were disseminated throughout the country through the State Councils / Departments of Science and Technology. The kit was even distributed to the 5600 odd members of the Vigyan Prasar Network of Science Clubs.

Vigyan Prasar jointly with Doordarshan telecast live on DD National channel an exclusive programme on Venus transit on June 08, 2004 - the details of which are available elsewhere in this issue. There is no gainsaying the fact that the untiring and concerted efforts over the years of VP, NCSTC, and a number of organizations / agencies engaged in science popularisation, both Government and non-Government, have started showing results only now. There was, however, one thing that was highly disconcerting. Several private TV channels prominently featured more astrologers than astronomers and scientists! These channels appeared to be more concerned with the effect of Venus and Venus Transit on human life than making people aware of the scientific aspects of this rare phenomenon. If the media played a pro-active role, our country could be transformed into a nation of scientifically thinking people much faster.

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Darashaw Noshervan Wadia

Pioneer of Geological Investigations in India

□ Subodh Mahanti

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"A giant among geologists, Darashaw Noshervan Wadia was a great visionary who not only shaped our understanding of the geological making of the Indian subcontinent but also set the national agenda of geological activities when India won freedom."

K. S. Valdiya

"Fortunately for India, it found in Wadia an eminent geologist of its own, who would enthuse generations of Indian geologists. To say that he was energetic and hardworking is perhaps an understatement; one found clambering up and down the Nanga Parbat area of the Himalayas, at the height of twelve thousand feet, when he was fifty."

Biman Nath

"It is granted to very few to live and to live fully to the last, and be revered and remembered after death. One such was Darashaw Noshervan Wadia. His life was spent in unswerving worship of geology, the Stony Muse whose ardent votary he was. Through his hard and continuous labour over the years, he made important contributions to Indian geology and left a lasting impress on it. He remained unaffected in his simplicity and poise when honours, both at home and abroad, came his way."

K. K. Dar

Darashaw Noshervan Wadia was one of those great geologists of the Geological Survey of India, whose pioneering work laid the foundation of geological

investigations in India. What is important to note is that most of his observations and interpretations in those early days of Indian geology still hold good. Wadia's career was a single-minded pursuit of his scientific interests and indefatigable effort. He climbed peak after peak in the Himalayas to understand their geology and their structure. Wadia explained the abnormal sequence of rock formations of varied ages in the North-Western Himalayas. He also offered an explanation for the formation of the unique knee-bend of the mountain chains around the knot called Nanga Parbat. For the first time he gave a detailed geological account of the districts of Chilas, Astor-Deosai and Hazara. Wadia's devotion to the study of the Himalayas was unlimited. Wadia was a great visionary. He was

responsible for the establishment of the Institute of Himalayan Geology in Dehradun and became its founder director (1968-69). The Institute was later renamed as the Wadia Institute of Himalayan Geology in Wadia's memory. He was intimately associated with the establishment and functioning of the National Geophysical Research Institute at Hyderabad and the National Institute of Oceanography in Panaji, Goa. Wadia was the founder director of the Indian Bureau of Mines (1947) and the Atomic Minerals Division (1949-69). Wadia was an ardent advocate of a national policy for the search, utilization and conservation of mineral resources including gas, oil and water. He was an avid

reader and wrote the first textbook on Indian geology that enthused generations of geologists. Wadia was extremely energetic and hardworking and lived a simple life.



D.N. Wadia

Wadia was born on October 23, 1883 at Surat, a historical town in Gujarat in a Parsee family. He was the fourth of nine children of his parents, Noshervan and Cooverbai Wadia. He was a descendant of the well-known clan of the Wadias, the erstwhile shipbuilders of Surat. When the Wadias built ships in Surat, it was an important west-coast port for maritime trade and commerce. With the development of its dockyard in 1735, the city of Mumbai (then Bombay) became the centre of maritime trade and commerce in the west coast. Most of the Wadias shifted to Mumbai. Only a few families preferred to stay back at Surat. In Mumbai, the Wadias rose quickly in the ladder of social hierarchy. The Wadias occupied important positions in industry, commerce, and education. Ardseer Cursetjee (1807-1877), a member of the Wadia clan, was

the first Indian to be elected as the Fellow of the Royal Society (FRS) of London in 1841. Cursetjee was a naval architect and marine engineer.

Wadia's father, Noshervan Wadia, was a Station Master at a small railway station. As there was not much scope of education where his father worked, Wadia was kept in Surat under the care of his grandmother. Wadia first studied in a private Gujarati school and then in Sir J J English School to complete primary education. At the age of 11, Wadia joined the Baroda High School at Baroda, where his family shifted from Surat. At Baroda Wadia came under the influence of his elder brother, Munchershaw N. Wadia. From

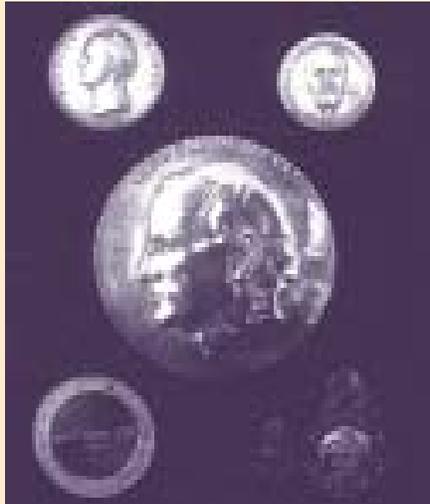
Munchershaw, who was a well-known educationist, Wadia imbibed three important qualities of his life—a strong love for science, devotion to knowledge and a rational outlook.

After completing his school education, at the age of 16, Wadia joined the Baroda College, which was then affiliated to Bombay University. From Baroda College, Wadia completed two BSc degrees. His first BSc degree, which he obtained in 1903, was in Zoology and Botany. He obtained his second BSc degree in 1905, which was in Botany and Geology. Wadia's interest in geology was aroused by his teacher at the Baroda College, Adarjee M. Masani, a keen naturalist and Professor of Natural history. In those days Baroda College did not have sufficient facilities for imparting education in geology therefore whatever Wadia learned was mostly through self-study. At Baroda College, Wadia was also influenced by Aurobindo Ghosh, who was then a Professor of English. Aurobindo later turned a mystic, philosopher and saint. In 1905 Wadia was appointed Fellow of the Baroda College. He completed his MSc degree in Biology and Geology in 1906. The geological specimen kept in the Museum of Arts and Science at Baroda greatly helped Wadia to pursue his geological studies. The Museum was set up under the patronage of the then ruler of Baroda State, Maharaja Sayaji Rao Gaekwar.

In 1907 Wadia joined the Prince of Wales College in Jammu in the erstwhile State of Jammu and Kashmir as Professor of Geology. The Prince of Wales College was later renamed as Mahatma Gandhi College and now it is affiliated to the Jammu University. He served at the Prince of Wales College for 14 years. Besides geology, Wadia also taught English, a testimony of his command over the language. During his services at the College, Wadia spent his vacations in the foot-hills of the Himalayas to get familiarised with their geology. He also collected minerals, rocks and fossils to aid his teaching at the college and also to solve problems that emerged from his field trips. Commenting on Wadia's teaching and research work in geology during his stay at Jammu, KS Valdiya, an eminent geologist, has written: "He used to take his students on adventure trekking and investigative field trips in the Siwalik Hills of the Jammu region. It was in one of these ventures that he discovered a 3 metre long fossil tusk of an elephantine mammal *Stegodon ganesa*, a finding of crucial importance. He pursued his personal research on stratigraphy, structure and palaeontology of the Kashmir Himalaya with single-minded devotion. Having a very keen eye for observation, he worked towards identification of broad structural elements of the NW Himalaya." The fossil

tusk is now kept at the Museum of the Geology Department of the Jammu University.

In 1921 Wadia left the Prince of Wales College, and joined the Geological Survey of India (GSI) in 1921 as Assistant Superintendent. He was 38. It has been reported that Wadia was the first Indian without any European degree to be appointed in the GSI. Wadia's appointment provided him ample opportunities for carrying out investigations on



Prestigious medals awarded to Dr. D.N. Wadia include Charles Lyell, Divisao de Geologia e Mineralogia, Leopold von Buch, Meghnad Saha and Padma Bhushan

the stratigraphy and tectonics of the northwestern Himalayas. Wadia embarked upon the arduous and challenging task of mapping and interpretation of the geology of North Western Himalayas. It was a very laborious work. Thus K. K. Dar wrote: "Nothing can speak so much of Wadia's unremitting labour as the fact that when his first memoir was published in 1928 with his geological map, he was found to have covered not only the 2,000 square miles of the mountaineous Poonch State in the Middle and Lesser Himalayas, but an additional 2,100 square miles of the piedemount country in the adjacent parts of Punjab." He made pioneering contributions. R. D West wrote: "wherever Wadia travelled in the Himalayas he was successful in throwing significant light on problems of

stratigraphy and tectonics which had hitherto remained uninvestigated or unexplored." Wadia authored about one hundred original research papers, monographs on various topics and the Records and Memoirs of the Geological Survey of India.

Wadia's work led to the understanding of the geological history of the northwestern Kashmir. He gave a detailed geological account of the *terra-incognita* that Chilas, Astor-Deosai and Hazara districts were then. Against all difficulties Wadia succeeded in the mapping of the geological structure and the rock and mineral composition of the Nanga Parbat and adjoining portions of Chilas in Gilgit district. The basic geological information on the Nanga Parbat gathered by Wadia has become the basis for future research on tectonics of the region.

Wadia developed his explanation of the 'knee-bend' (or syntaxial turn) of the Himalayan mountain chains around the knot called Nanga Parbat. Wadia's explanation differed from the earlier interpretations. The regional Himalayan trend in the Kashmiri PirPanjal is North-West to South-East. Further North-West the trend becomes North-South and then makes knee-bend to make the trend northeast-southeast in Hazara. This deeply inflexed knee-bend, which is called the Hazara or Jhelam Syntaxis, is a spectacularly unique orographic feature and which affects hundreds of kilometers of the Himalayan mountain system. Earlier Edward Suess, the eminent Swiss geologist, had suggested that the bend was

a meeting or converging point of two distinct mountain systems, the Himalayas and Hindukush. Wadia gave a tectonic interpretation for the formation of the knee-bend. He suggested that the bend was produced by a loop-like bending around a central pivotal mass of the fold systems of Purana (older than 500 million years) and Carboniferous-Eocene (355 to 30 million years old) rock groups of the Middle and Inner Himalayas. Wadia's explanations have been validated by more recent studies in structural analysis, metamorphism and geochronological dating.

Wadia made important contributions on the geological setting and economic minerals of limestones found as island-like mass forms of older rocks amidst younger sedimentary rocks in the Sub-Himalayan Tertiary belt of Jammu. He prepared detailed geological map of the Dandili-Devogar hills in the Kotli area of Jammu region. He demonstrated that tectonic deformation in this area is of very recent origin and the topography is of very young in nature. Wadia discovered the existence of vast reservoir of sulphide ores of copper, nickel, lead and zinc.

In 1928, Wadia discovered a very well-preserved skull of *Actinodon* from *Gangamopteris* beds of Lower Gondwana affinity. The discovery of this skull, which was found in association with fossil *ganoid* fish and *pteridospermous* plants, led to the fixing of the age of an important geological rock

formation in the Kashmir Himalaya to the *Permo-Carboniferous* time (355 – 250 million years). As noted earlier, Wadia had discovered bones *Stegodon ganesa*

Wadia's contribution to the soil science in India was very significant. It was Wadia who not only noted the neglect of soil science in India but also showed the way for its rectification by his own writings. In 1935 Wadia, jointly with M. S. Krishnan and P. N. Mukherjee, published the first soil map of India. This was published by the Geological Survey of India and paved the way for later soil maps. Thus Wadia's work had considerable bearing on agricultural development in the country. He represented India at the 3rd International Congress of Soil Science held at Oxford in 1935 and also participated in an excursion arranged by the Congress to study the soil profiles in England, Wales and Scotland. Wadia also participated in the 2nd International Congress of Carboniferous Stratigraphy at Heerlen in Holland.

One of his major contributions was his textbook on geology for Indian students. The book was titled *Geology of India for Students* and it was published by Macmillans in 1919. A book on Indian geology was very much needed as there was no adequate material on the subject. In 1887, the Geological Survey of India, had published the work of the early pioneers of Indian geology, H. B. Medlicott and W. T. Blanford. This was revised by R. D. Oldham in 1893 and issued as the *Manual of the Geology of India*. (It may be

noted that R. D. Oldham was the first Director of Geological Survey of India. Oldham had assumed his post in 1851). However, this manual had gone out of print and moreover it had become outdated, as more knowledge on the geology had gathered. Wadia realized the acute need of a textbook on Indian geology while he was teaching at the Prince of Wales College. Recalling his experience Wadia wrote: "a lecturer in geology of students preparing for the Punjab University examinations, I have constantly experienced great difficulty in the teaching of the geology of India, because of the absence of any modern adequate book on the subject." For writing the book he was greatly encouraged by Sir T. H. Holland, FRS and C. C. Middlemiss. Wadia's book, which proved to be a classic on the subject, reached its sixth edition in 1966. Commenting on the book, K. S. Valdyia wrote: The erudite book he wrote—*The Geology of India*—published in 1919 by the Macmillans, London, distills his vast and intimate knowledge of the geology of the entire

Indian subcontinent, embracing Pakistan, India, Bangladesh, Myanmar and Sri Lanka. This classical work, which had six editions, made him not only a celebrity but also a guru of countless generations of students of geology all over the world." R. D. West, former Director, Geological Survey of India wrote: "Written, as are all his contributions, in matchless, and in places Churchillian style, it has

had a profound influence on generations of students of geology, attracting them where others might have repelled, and stimulating them to take a keen interest in the subject of Indian geology." His other important publications were: *Syntaxis of North-Western Himalayas: Its Rocks, Tectonics and Orogeny* (1931); *Geology of Nanga Parbat and Gilgit District* (1932); *Cretaceous Volcanic Series in the Great Himalayan Range of Kashmir* (1937); *Structure of the Himalayas and of the North Indian Foreland* (1938); *Minerals and Metal Resources of India*, United Nations Conference, New York (1949) and World Mining and Metallurgical Congress, London (1949).

While working in the Geological Survey of India, Wadia spent his study leave (in 1926-1927) at the British Museum, where he worked on the vertebrate fossils collected from Potwar and Kashmir. During this period he also visited geological institutions in Germany, Austria and Czechoslovakia and attended a course in Alpine geology at the University of Geneva. In 1935 he visited China, Japan and USA and in 1937 he attended the International Geological Congress held at Moscow where he presented his famous paper on the "Tectonic Relations of the Himalayas with the North Indian Foreland."

After his retirement from the Geological Survey of India in 1938 he joined as the Government Mineralogist to the Government of Sri Lanka (then Ceylone). This gave him an



Dr. D.N. Wadia with President of India Dr. Sarvapalli Radhakrishnan at the International Geological Congress, 1964

opportunity to study the unique geology of an island in a stable continental region. His studies included accurate geological maps of the island and geological investigations concerning water supply, dam-sites and other engineering projects. It was Wadia who first produced the geological



D.N. Wadia with his friend's
(Source : www.unescoparzor.comigppl.html)

sketch map of Colombo. He showed four distinct units of geological formations viz. intrusive granites and charnockites; fundamental biotitegneiss of Vijayan series; laterite and laterite earth; and Pleistocene and recent alluvial gravel and coastal deposits.

In 1945 Wadia was appointed the Geological Advisor to the national government of Pt. Jawaharlal Nehru. He initiated and formulated a mineral policy for the country. In 1963 the Government of India made him the first National Professor in geology. The government of India honoured him with the award of *Padma Bhushan* (1958).

In 1957 Wadia was elected a Fellow of the Royal Society of London. Among other awards he received were: the *Back Award* from the Royal Geographical Society (1934); the *Lyell Medal* of the Geological Society of London ((1943); the *Joy Kishen Gold Medal* of the Indian Association for the Cultivation of Science, Calcutta (1944); the *Jagadis Chandra Bose Memorial Medal* from the Royal Asiatic Society (1947); the Leopold von Buch Award of the German Geological Society (1960); *Khaitan Gold Medal* of the Asiatic Society (1964); the *Sarvadhikari Gold Medal* from Calcutta University (1964). Wadia was also the recipient of the *Meghnad Saha Medal* of the Indian National Science Academy and the *P. N. Bose Memorial Medal* of the Asiatic Society of Bengal. He was awarded honorary degrees by a number of Indian Universities. The Royal Asiatic Society of Ceylon conferred upon him its Honorary Fellowship for his contributions to geology of Ceylon (now Sri Lanka). He was a Commonwealth member of the Geological Society of London; President of the National Institute of Sciences of India (later renamed as Indian National Science Academy)

during 1946-47; President of the Geology Section of the Indian Science Congress (1921 and 1938); General President of the Indian Science Congress (1942 and 1943); President of the Calcutta Geographical Society (1938); Inaugural President of Indian Society of Soil Sciences (1949); President of the Geological Society of India (1951-52); President of the Mining, Geological and Metallurgical Institute of India (1951-52). President of Geographers' Association of India (1955); President of the XXII International Geological Congress at Delhi (1964); President of the Engineering Geological Society of India (1965-66) and President of the Geochemical Society of India (1965-67). He was the Chairman of the Indian National committee for Oceanic Research. He was a correspondent of the Geological Society of America and an honorary member of the German Geological Society and the Belgian Geological Society.

Wadia died on June 15, 1969 at the age of 86.

For Further Reading

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Letters to the Editor

I am writing this letter to express my deep appreciation for publication of so good and useful journal which I have been receiving since its inception. I read it from cover to cover. I hope that the journal will grow and progress further.

Dr. P.P. Mathur

Pondicherry University, R.V. Nagar, Pondicherry 605 014

The Monthly Newsletter deeply impressed me which can't express in words. Articles by you on "Birbal Sahni" and "Antonie Laurent Lavoisier" as well as other informative essays have imbibed by attention to such an extent that I am really speechless. Your description in the "History of Science" column undoubtedly bears the mark of scholarship. Please keep up to morale of the Newsletter under your publishing guidance.

Dr. Vijay Kumar Roy

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Pimples

Take a Clean Break



□ **Dr. Yatish Agarwal**

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Just as you enter into your teens, you surrender your peaches and cream complexion to pimples. Your skin, which you want should look at its best, turns grumpy, covered with pink, white and black dots. You panic and try remedies by the dozen, but they continue to pop on your face.

Pimples, or acne, are actually just heaped up oil glands in the deeper layer of skin. Whipped into action by hormones which give us sexual maturity, the glands start in a rush and make a hash of things. Their openings on the skin surface get clogged, because of too much of sebum jamming them. Whiteheads crop up and pink and red bumps appear. And when air oxidises some of the hardened plugs

on the skin surface, blackheads appear. Some glands also get inflamed and fill up with pus. Your agony is complete.

If you take sensible measures, things can still cool down. Don't succumb to the myths, which are prevalent in plenty. Pimples do not result from any impurity of blood, nor are they the result of any particular food. Sex—either the lack of it or too much of it—would not lead to them either. A woman may break around her 'time of the month', but you may also suffer a fresh attack when you are stressed or scared or excited—or for no reason at all. Yet, certain remedies always come useful, and you can trust them:

Soap and water work wonders : Pimples despise cleanliness and just pack up and flee if you wash the face and all affected parts regularly. Your best zit-zapping plan of attack is to wash with soap and warm water in the morning and at night, and rinse well with cool water before patting them dry with a clean towel. Never scrub.

Take care that you wash thoroughly, especially in the areas where grease tends to accumulate, like in the crevices such as nasal folds. Ordinary soap is quite adequate, although mild non-greasy ones are the best.

Keep the hair clean : Greasy hair means greasy skin. You could do better without it. Shampoo your scalp regularly and if you have dandruff, use a selenium sulphide, cetrimide or any other anti-dandruff shampoo.

Go for the natural look : Use as little make-up as possible. In case you must, use only non-greasy cosmetics. Apply them only after washing your face. And always wipe them clean before you go to bed.

Try out simple anti-acne lotions : Many anti-acne lotions and creams are available over the counter. You could try any of them, although benzoyl peroxide and retionic acid

(vitamin A preparation) are probably the most effective. Apply them at bedtime after washing your face with a mild soap and lukewarm water. Dab dry with a soft towel, then apply the lotion. This will help the upper skin layer to peel off and remove the acne spots. But you must be careful to know that some acne medications react adversely in the sun, and therefore, are best washed away the first thing in the morning.

Be gentle on the blackheads : If you have blackheads, you could use a comedone extractor or take the help of an aesthetician. A comedone extractor is just a metal object with a hole in the centre. It is pretty easy to use. All you need to do is

place it over the blackhead and apply some pressure. The blackhead pops out into the hole in the instrument and leaves the skin surface clean. But be careful. Do not exert undue pressure with your nails or finger if the blackhead is resistant.

Take a well balanced diet : Until a few years ago, chocolates, nuts and fatty foods were considered taboo if you had pimples. That's not the case now. If you wish to check out, run a little experiment yourself. See if any particular food causes you to "break out". Put this food item off the menu and see if it helps. In case it does, keep it that way. Otherwise, why bother?

Some medications worsen pimples : Some medications such as steroids, anti-epileptics, anti-thyroid preparations and isoniazid (an anti-tubercular drug) can aggravate pimples. This should not worry you too much, because the disease condition for which they are prescribed always takes the precedence. In case the flare-ups get out of hand, you should talk to your doctor.

Take it easy : Stay off stress. Do regular exercise and keep yourself physically and mentally fit. Emotional upsets, tensions and anxieties can cause a flare-up. Keep them to the minimum.

See your doctor. If these simple measures do not work, see a dermatologist or your family physician. He has several other options before him. They include:

Antibiotics: Both tetracycline and erythromycin exert a beneficial effect on the lesions of acne. They are, however, best used in severe cases. The dose given is small, although it has to be taken for a prolonged period.

Oral contraceptives: The pill, which is a combination of

contd on page... 28



Wadia Institute of Himalayan Geology

□ R.A.K. Srivastava

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The institute is an autonomous research organisation fully funded by the Department and Science and Technology, Government of India. Established in June, 1968 as a small nucleus in two rooms of the Botany Department, Delhi University, the Institute was shifted to Dehra Dun during April, 1976. Originally named as the Institute of Himalayan Geology, it was renamed as the Wadia Institute of Himalayan Geology to honour its founder-Prof. D.N. Wadia, for his contributions to the Geology of the Himalaya. During the last 36 years the Institute has grown into a full-fledged national laboratory of international repute with well equipped laboratories and other infrastructural facilities for undertaking advanced level of research in the Himalayan geology and related fields. The main objectives of the institute are:

- To undertake, aid, promote, guide and coordinate researches in the geology of the Himalaya and foster a tradition of scholarships.
- To carry-out research towards the development of new concepts and models concerning



Wadia Institute of Himalayan Geology, Dehradun

geodynamic evolution of the Himalaya through an integrated interdisciplinary approach.

- To coordinate research activity amongst different institutions and universities in the country working in the field of Himalayan Geology and related areas.
- To organise workshops, seminars, symposia and training programs in specialized disciplines and on topics related to the geology of Himalaya.
- To serve as the National Reference Center for the geology of Himalaya and to provide high level consultancy services to various institutions, public agencies and industries.
- To collaborate with foreign research organisations and universities in the fields relevant to the objectives of the institute with special emphasis on application of new tools, methodologies and analytical techniques.
- To disseminate knowledge and information relating to geological and allied researches in the Himalaya through publication of monographs, research papers, maps, scientific reports, bibliographies, etc.
- To establish affiliation with recognized universities and centers of higher education to promote Himalaya geology and enable research scholars to register for post-graduate and research degrees.
- To inspire and encourage young earth scientists in the study of the geology of the Himalaya.
- To institute a Wadia National

Fellowship in Himalayan Geology for carrying out research work at the institute.

The Wadia Institute of Himalayan Geology carries out basic research in Himalayan Geology and related fields which includes geodynamic evolution, mountain building processes, geoenvironment, natural hazards, mineral resources and glaciology. The areas of its multi-disciplinary research activities are organised into the following six groups namely:

Structure and Tectonics : Kinematic analysis of structures in rocks, lineaments using remote sensing techniques, experimental structural geology, regional geology and tectonic analysis, neotectonics and active faults.

Geophysics : Seismicity, seismotectonics, palaeoseismology, gravity-magnetic studies and crustal deformation using GPS.

Igneous Petrology and Geochemistry : Petrology and geochemistry of magmatic (particularly granitoids and volcanics) and metamorphic rocks including geothermobarometry, ore-microscopy and fluid inclusion, fission track dating, data base and application of computers in petrology, analytical geochemistry and radon studies, rare earth and isotope geochemistry.

Sedimentology : Ancient fluvial and marine environments and processes, sedimentation and tectonic, palaeoclimate studies, magnetostratigraphic and TL/OSL dating.

Biostratigraphy : Invertebrate and vertebrate palaeontology, micropalaeontology and palynology, Specialisation in ostracodes, conodonts, foraminifera, brachiopods, gastropods, bivalves, trilobites and tracefossils, early forms of life, stromatolites, algae and micro-vertebrates and regional biostratigraphic correlation.

Geomorphology and Environment Geology- Geomorphological processes, landform analysis, palaeoclimatic studies, natural resources, landslides and glaciological studies.

Thrust areas of research

In the early years of the Institute, the major thrust of the research activity was directed towards remote areas with difficult mountainous terrain and hard working conditions, as well as where the geological framework and geological knowledge were lacking. In the beginning Arunachal Himalaya, Higher Himalaya of Kumaun and Lahaul-Spirit and Indus-Suture of Ladakh and Karakoram were taken as priority areas for geological research. Now the thrust of the research has been focused on some specialized areas of national as well as international relevance in both the western and eastern Himalaya.

In the Tenth Five Year Plan, six major areas of research identified are:

(i) Crustal evolution and Geodynamics (ii) Basin Evolution and High Resolution Stratigraphy. (iii) Natural



Hazards. (iv) Placiology and Water Resources. (v) Palaeoclimate and (vi) Geo-database.

The projects formulated under the first two thrust areas are purely basic research; but the last four thrust areas namely Natural Hazards, Glaciology and Water Resources, Palaeoclimate and Geo-database have direct societal relevance. In addition Northeast Syntaxis region in Arunachal Pradesh in the Northeast has been taken up recently for geodynamic and natural hazards (earthquake and landside) studies.

Promotion of Research

To promote geoscience research in Himalaya the Institute organizes every year Himalyan Geology seminars, symposia and workshop on specialized themes. The institute has organised a series of six UNESCO Sponsored Regional Training courses in Structural Geology for Central and South Asian countries and three special courses in Analytical Techniques and interpretation in petrology and geochemistry. The courses are attended by young earth scientists from India and abroad especially from South Asia. The Institute scientists also a conduct training courses in Geology for IFS probationers. Link lectures by eminent geoscientist and visiting foreign scientists are regularly arranged. The Institute awards Research Fellowship to students working in Himalyaya in different universities in the country and Visiting Fellowships to promote national and international cooperation in research and training in earth sciences. D.N. Wadia ,J.B. Audin and W.D. West Honour lectures are organised by the institute every year.

The institute is taking part in three bilateral exchange programs with Russia (Indo-Russian) under Integrated Long Term Program (ILPT), USA (Indo-us) sponsored by NSF, and Hungry (Indo-Hungarian Inter Governmental S&T Cooperation Programme.)

The institute scientists are regularly interacting with their counterparts under the International Geology Correlation Programme (IGCP), International Lithosphere Programme (ILP), and International Geosphere Biosphere Programme (IGBP). A Memorandum. of understanding (MOU) has been signed with G.B. Pant Institute of Himalyan Environmental and Development, Birbal Sahni Institute of Palaeobotany, Centre for Development Studies of U.P.Academy Administration and KDMIPE (ONGC), and with Physical Research laboratory for collaborative research work interaction.

The institute has been recognized as a centre by a number of universities to guide research studies for Ph.D. in Geology.

Pimples *contd from page...30*



two normally occurring hormones, often has a positive effect on acne. In case you also need a birth control measure, this is a remedy worth trying for the double purpose.

Local applications: A variety of preparations of tretinoin; benzoyl peroxide; erythromycin; a methyl prednisolone, sulphur and neosporin combination;

Awards and Honours

The Institute's scientists have achieved both national and international recognition through their excellence in research.

Laboratory Facilities

Sophisticated analytical instrument facilities' in the institute are run by competent scientists and technicians. They provide facilities to research scientists of the institute as well to the universities and other organisations.

The Institute has Publication and Documentation facilities to bring out bibliographies, geoabstracts and field excursion guides. The Institute publishes a biannual Journal the "Himalayan Geology". It has published 25 volumes of Himalayan Geology series and 3 special publications which incorporate researches of the Institute as well as proceedings of the annual seminars organised by the Institute. Institute is also publishing monographs on different subjects.

Museum

The Institute has organised a small museum which is very popular with the visitors and especially the school children. The basic objective in organising the museum is to educate' students and general public as well as to highlight the Institute activities. The museum offers a glimpse of the mighty Himalaya, its origin, evolution in time and space, natural resources, life in the geological past, earthquakes, landslides and environmental aspects. It displays geological maps, charts, samples, models as well as various educational awareness exhibits including video films on Himalaya and general geology. The museum is named as 'S.P. Nautiyal museum' to honour its ex-chairman Shri S.P.Nautiyal, a eminent Himalayan geoscientist and administrator.

Consultancy

The Institute's experts provide a specialized consultancy service in site-selection for bridges in the Himalayan terrain, deep tubewells, multi storeyed building complexes, ropeways, transmission towers, control of landslides, road alignments. It also provides geotechnical consultancy for hydro-electric projects in Himalaya, including alignment of tunnels, site selection for barrages and power houses and environmental problems. Through its laboratory infrastructure facilities, the Institute provides analytical facilities to reasearches of universities and other organisation.

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metronidazole and others are available. The doctor can make the choice after examining you.

Don't fall for quack remedies : Many remedies, which use greasy products for their base, get advertised over the popular print and audio-visual media. Never use them, as they can worsen your problem. Likewise, do not waste money and effort on quack remedies, which sell entirely on the basis of unscrupulous advertisements.

• • •

The Himalayas

□ **Subodh Mahanti**

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The Himalayan Mountain System is the highest and most majestic mountain range of the world. It forms a broad continuous arc for nearly 2600 km along the northern fringes of the Indian subcontinent, from the bend of the Indus River in the northwest to the Brahmaputra River in the east. The



Himalayan range averages 320 to 400 km in width and it rises sharply from the Gangetic Plain. The Tibetan Plateau lies in the north of the Himalayan Range. The Himalayan Mountain System is a spectacle of awesome dimensions—ranges upon ranges, sharp sky piercing peaks crowned with perpetual snows, foaming rivers cut the deepest gorges, the shining lakes and rushing streams, and the most deeply scooped and verdant valleys. 'It always holds an indescribable charm, inspiration and spiritual significance to the millions in the world.'

The word 'Himalaya' is a Sanskrit word which means the "abode of snow". It has been the cradle of Indian civilization. It is the most sensitive and interactive land-ocean-atmospheric mountain system. The Himalayas are known for the diversity of its ecosystem.

The upliftment of the Himalayan Mountain System was a gradual process protracted over a very long period. It developed in a series of stages 30 to 50 million years ago. It was created from the powerful earth movements that occurred as the Indian plate pressed against the Eurasian continental plate. As a result of this collision, deposits laid down in the ancient, shallow Tethys Sea, located on the present site of the mountains, were raised to form the Himalayan ranges from Pakistan eastward across northern India, and from Nepal and Bhutan to the Myanmar border. Several distinct sequences of rocks separated from one another are recognized in the Himalayas. Even today the mountains continue to develop and change. The Indian plate continues to move northward relative to Asia about 5 cm per year that is at roughly twice the speed at which our fingernails grow. But this speed will appear to be remarkable once we consider the great magnitudes of the blocks of the Earth's crust.

The Himalayas form the Earth's highest mountain region. It contains nine of the ten highest peaks. Among

these peaks are the world's highest mountains, Mount Everest (8,848 m), K2 (8,611 m), Kanchenjunga (8,598 m), Makalu (8481 m), Dhaulagiri (8,172 m), Annapurna (8,091 m), Nanga Parbat (8,125) and Nanda Devi (7,817).

Tectonically the Himalayas can be divided into four roughly parallel zones. From north to south the zones are: (i) Tethyan Himalayas (ii) Central Crystalline Zone (iii) Lesser Himalayas (iv) Outer Himalayas.

The central Crystalline Zone consists of Precambrian basement rocks mixed with granitic intrusions of tertiary age. This zone has the highest Himalayan ranges. The Tethyan Himalayas and the Lesser Himalayas contain sedimentary rocks of palaeozoic –Mesozoic ages deposited over Precambrian basement. The Central Crystalline Zone separates these two zones. The Outer Himalayas form a separate geological unit consisting of sedimentary rocks originating from the rising Himalayas. Each of these zones display a highly complex geology disturbed by the Himalayan building processes.

Physically the Himalayan Mountain System is divided into three parallel zones: (I) The Great Himalayas, (II) The Middle Himalayas (also called the Inner or Lesser Himalayas), and (III) The Sub-Himalayas.

The Great Himalayan region is the highest zone of the Himalayan Mountain System. It consists of a huge line of snowy peaks with an average height exceeding 6100 m. The width of this zone is about 24 km. It is composed largely of gneiss and granite. The great Himalayan region is one of the few areas of the world, which have remained isolated and inaccessible till today. Some small clustered settlements are found in some high valleys in the high mountains.

The Middle Himalayas have a width of about 80 km. and borders the Great Himalayan Range in the south. It primarily consists of high ranges both within and outside the Great Himalayan Range. The Nag Tibba, the Dhaola



Dhar, the Pir Panjal and the Mahabharat are some of the ranges of the Middle Himalayas. This zone possesses a remarkable uniformity of height ranging between 1630 and 3050. This zone is a complex mosaic of forest-covered ranges and fertile valleys. Barring a few valley centers like Srinagar, Kangra and Katmandu and hill towns like Simla,

Mussoorie and Darjeeling, this region is moderately populated.

The Sub-Himalayas are the lowest zones of the Himalayan Mountain System. This region borders the plains of North India and Pakistan. It consists of the Siwalik Range and foothills as well as narrow piedmont plain at the base of the mountains. In this region there are a large number of long, flat-bottomed valleys known as duns. These valleys are usually spindle-shaped and filled with gravely alluvium. To the south of the foothills lie the Tarai and Duars.

The Himalayan Mountain System influences the climate of the Indian subcontinent. It shelters the subcontinent from the cold air mass of Central Asia and it also exerts a major



influence on monsoon and rainfall patterns. The climate within the Himalayas varies widely depending on height and location. At a height of above 4,880 m the climate is very cold with below freezing temperatures and the area is permanently covered with snow and ice. While the eastern part of the Himalayas receives heavy rainfall, the western part is drier.

The natural vegetation of the Himalayan Mountain System is greatly influenced by climate and elevation. At one point of time the higher parts of the entire sub-Himalayan area was covered with tropical, moist deciduous forest. However, today most of this forest is lost. It was cut for commercial lumber and agricultural land. The natural vegetation in the Middle Himalayas at elevations between 1520 and 3660 m mainly consists of species of pine, oak, rhododendron, polar, walnut, and larch. The higher parts of the Great Himalayas, just below the snow line, are occupied with alpine vegetation including shrubs, rhododendrons, mosses, lichens, and wild flowers such as poppies and edelweiss. Below the timberline the Great Himalayas contain valuable forests of spruce, fir, cypress, juniper, and birch.

Unfortunately the habitat of most of the wildlife in the Himalayas has been destroyed because of large-scale deforestation. Animals such as tigers, leopards, rhinoceroses, and many varieties of deer once freely moved in the forested areas of the Sub-Himalayan foothills and the Tarai planes. However, today they are to be found mostly in special protected areas or sanctuaries. There are very few animals in the Middle Himalayas because of large-scale deforestation.

The Himalayan Mountain System is home to unique ecosystems, plants, animals and other organisms. The region is endowed with the highest ethnic and cultural diversity. About 40 million people inhabit the Himalayas. Hindus of Indian heritage are dominant in the Sub-Himalayas and the Middle Himalayan Valleys from eastern Kashmir to Nepal. Tibetan Buddhists inhabit the Great Himalayas from Ladakh to northeast India. The eastern Himalayas in India and nearby areas of eastern Bhutan are inhabited by people whose culture is similar to people living in northern Myanmar and Yunnan province in China. People of western Kashmir have a culture similar to the people of Afghanistan and Iran. People living in isolated valleys have generally preserved their cultural identities. However, gradual improvements in transportation and communication particularly satellite communication, have linked the people living in these areas to the outside world. This in turn has affected their traditional social and cultural structure.

The perennial Himalayan river system is very unique; it forms the largest highland-lowland interactive system. The Himalayan river system consists of three major river systems—Indus, Ganga and Brahmaputra.

The economy of the Himalayas is relatively poor with low per capita income. Different communities living in the mountains brought about production systems striking a balance between the carrying capacity of the region and human needs through centuries of experimentation and adaptations. However, this balance was lost with increasing population and outside interventions mostly for commercial interest. There are acute problems of under-employment, poor education, poor communication and transport facilities. Most of the population is dependent on agriculture, primarily subsistence agriculture. The formidable mountains have limited the development of large-scale trade and economics. This is despite the fact that highways have been constructed across the mountains.

The Himalayas have been adversely affected by human interventions. The original inhabitants of the mountains who have been living in harmony with the environment have been marginalized. The mountains have been converted into a battleground between conservationists and commercial interests groups. Biodiversity in the region is being lost at an alarming rate. There is severe soil erosion, extensive runoff and land degradation.



(Editorial) Venus has... (contd from page... 35)

Finally, it was gratifying to note that in a decade since the total solar eclipse of 1995, the number of people interested in science in our country has grown astronomically! Only one other transit will occur this century, on June 6, 2012. That event will be visible at least in part for most of the world, except for Western Africa and most of South America. In India, we shall be able to see only the egress. Let us wait until then! Afterward there will be a 105-year wait until the next one, on December 11, 2117.

□ V. B. Kamble

Enter Simputer

□ Rintu Nath

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Picture it! Miles away from the glitter and glamour of cities, there is a small village. The village has the basic amenities, but till yesterday, they were deprived of much information that could be useful for them. Today, an interesting thing is happening in this village. The farmers in this village are captivated and engrossed with a small device. It looks like a small handheld computer. They share this machine among them. Some farmers are browsing the websites in this machine to know the latest market price of their crops, while some others are trying to get the information about the weather to prepare well for the best harvest. Still some others are using it for updating their money matters. Everybody uses a data card



Simputer during early days

similar to the shape of credit card, which one inserts into the gadget to retrieve or store his personal data. Irrespective of literate or illiterate, everybody uses this machine at ease with its full functionality. A picture that every city dwellers would feel envy about!

Well, this is no more a science fiction story. It may soon be the most common picture in Indian villages. Painting of this picture is now reality due to the *Simputer*, a simple, inexpensive, mobile, multilingual computer. Coined from the expression 'Simple Computer', it is indeed the simplest form of handheld computer with innumerable functionalities that is basically aimed at the poor rural people who cannot read or write. This was conceived to bridge across the digital divide from privileged urban society to poor rural farmers. The Simputer has easy-to-use applications including voicemail, text-to-speech capabilities and internet access. And most importantly, it is almost three times cheaper than a Personal Computer.

The birth of a simple idea

Vinay Deshpande, the chief executive of Bangalore-based Encore Software, got a simple idea while chatting with an owner of a small community bank at a family wedding near Mumbai in November, 1998. The banker had a problem. He operates a 'pygmy deposit scheme', where independent agents travel to isolated villages to collect deposits and make payments as small as one rupee. The agents give paper receipts, and sometimes cheat the bank by turning in altered copies of the deposit slips listing smaller amounts. Catching such cheaters often takes days or weeks. The banker wanted a handheld cheaper device with an attached receipt printer that agents could use to collect and deposit data, downloading the information by phone to the bank's computers at the end of the day. This device would help in reducing the theft considerably.

Deshpande got the idea and soon assembled a team of academics from the Indian Institute of Science (IISc), Bangalore

and engineers from his company. The group quickly realized any device created for the banker could solve many other problems in many countries. The idea of 'Simputer' was born. Later, the 'Simputer' idea was described in a concept paper

presented at the first Bangalore IT.com conference in 1999. The group got good response and encouragement from their colleagues for this simple and brilliant idea.

Shaping the idea

In April 2001, Simputer Trust was formed by officials at Encore and professors from IISc to license designs of the device. Simputer Trust is a non-profit trust, which was created to develop technology that would spread the information

technology to rural areas. There were seven trustees: Vijay Chandru (IISc), Vinay Deshpande (Managing Trustee, Encore), Shashank Garg (Encore), Ramesh Hariharan (IISc), Professor Manohar (IISc), Mark Mathias (Encore), and V. Vinay (IISc). The initial target was India and if it is applicable in India, it will also be applicable in the rest of the third world.

Two companies, PicoPeta Simputer and Encore Technologies, have been given the licenses to produce the Simputer. PicoPeta Simputer was started in 2001 and it is looking at retail sales. Encore Technologies, the other manufacturer of the Simputer, limited itself to bulk sales only. From June, 2002, Encore started selling out small batches of the Simputer in the market. It formally launched Simputer in Singapore in October, 2002.

In October, 2002, Bharat Electronics Limited (BEL) and PicoPeta Simputers Private Limited announced an alliance to manufacture and market a new range of Simputers. These devices are marketed as BEL-PicoPeta Simputers and cover a spectrum of applications and price points. BEL manufactures and distributes the Simputer while PicoPeta does the technology development and design. The product is renamed as 'Amida' which was taken from Sanskrit word *amita* meaning 'unbounded'. However, the project was delayed due to funding problem as well as absence of easy and bulk availability of major components (like processor, memory, LCD etc.) in local market. In January, 2003, PicoPeta got a boost in its venture with the support from the Technology Development Board of the Department of Science and Technology of the Government of India. After a long and eager waiting, Amida was launched in India on 26 March, 2004. Amida was the result of unique joint venture of academics, industry and academy developed entrepreneurs of IISc, BEL and PicoPeta Ltd. The first retail version of Amida, the Simputer, conceived as a Linux based platform that could inexpensively bring easy-to-use computers to rural

Indian villages. Three models are currently available, priced from Rs 10,000 to Rs 20,000.

Hardware in Simputer

Built around Intel's Strong ARM Central Processing Unit (CPU), with Linux as the operating system, both 'Amida' and 'Encore Simputer' have flash memory, a liquid crystal display (LCD) with a touch panel overlay for pen-based computing, and a local-language interface. The device has IrDA (Infrared Data Association), WiFi/ blue-tooth adapter and Universal Serial Bus (USB) interfaces. All the models are based on a 133/ 206 Mega Hertz (MHz) processor, and include a three-pin RS232 serial port, two USB 1.1 host ports, and one USB 1.1 device port. They support internet connections via a landline modem (PicoPeta sells a small modem as a Simputer accessory), or a CDMA phone. While the first prototype of the product offers a modem for only fixed telephone line connectivity, later versions will also offer wireless technology.



Latest Amida Simputer from Bel-PicoPeta browsing interact through CDMA mobile phone

The initial version of the Simputer is based on Reduced Instruction Set Computing (RISC) microprocessor designed for embedded applications. The StrongARM has a high level of integration and performance at a relatively low level of power consumption. The least expensive Simputer from BEL-PicoPeta, the Rs 10,000 Amida 1200, features 16MB of Flash, 32MB of Random Access Memory (RAM), a minimal software suite, a 16-color greyscale LCD with a touch panel overlay for pen-based computing, and a local-language interface. The Rs 13,000 Amida1600 model features 32MB of Flash, and 64MB of RAM, and adds a full software suite, Infrared, built-in speakers, microphone and a SmartCard reader/writer. The Rs 20,000 Amida4200 model adds a 64-thousand colour display and a black or brown shell colour. The Amida Simputer weighs 206 grams with the included rechargeable 3.7V, 2200 mAh lithium-ion battery. It has battery life of 6-8 hours under normal usage.

An important feature of the Simputer is the SmartCard reader/writer. The SmartCard is emerging as a credible delivery vehicle for financial transactions on the internet and has become an important tool for electronic commerce. The incorporation of a SmartCard reader/writer in the Simputer increases the functionality of the mobile device for deployment of a richer set of value-added services, including services such as home and micro-banking through personal ATMs, home shopping, etc. The SmartCard interface enables a diverse range of applications that require security. Because the device lacks a hard drive,

smart cards will act as the device's portable storage units. In this way, many people will be able to share a single Simputer without having to share their private information with one another. Therefore the SmartCard is the basic method by which this device can be personalized. A user's individual profile can be stored on a SmartCard, which he can carry around with him. Once inserted into the SmartCard Interface, the Simputer will read the profile from the SmartCard and also update changes if any, during the current transaction cycle. SmartCard will hold four to eight kilobytes of data, and may be enough to carry some basic information for each user. It costs around rupees 50 to 100.

The Simputer operating system, tools and the main application resides in Flash Read Only Memory (ROM) so that the system can quickly start operation when powered up. User profiles can be stored in Flash memory as accessible files or also in the SmartCard. The Simputer offers a wide range of connectivity options because of its primary focus as an access device. The primary connectivity option is a V.34/V.90 Modem. There is also an IrDA interface for internetting with PCs and IrDA-compatible peripherals such as printers. Finally, there is a built-in USB host port that can be used for extension and peripherals. One can connect keyboards, printers, scanners, hard disk drives, video camera etc. through its USB port.

Like the Palm, the Visor and other personal digital assistants (PDAs), the Simputer has a touch-sensitive screen. One uses a stylus to tap on icons and to input information. The device does not have a keyboard or handwriting-recognition software, but in certain applications the user can select letters or numbers from a software-generated keyboard that pops up on the screen. In addition, the Simputer has a hardware program called 'Tap-a-tap' that displays a three-by-three grid. One can input a letter or number by tapping on the squares of the grid in a particular sequence. Although this method is easier than hunting and pecking on a software keyboard, it is still somewhat laborious. So the Simputer's applications have been carefully designed to minimize the need for tapping in text.

The Simputer is a mobile computer platform and will be applicable in several applications of mobile computing. The Simputer platform technology, being a cost-effective platform, can be used to develop several other products such as Thin Clients, Kiosk Computer, cost-effective Point-of-Sale terminal and in embedded systems.

For the hardware, the Trust has come up with its own definition of an open source like license called Simputer General Public License (SGPL). Anybody can download the hardware specifications of the Simputer and build his own machine or further develop on it. However, the producer must then obtain any one of two possible licenses from the Simputer Trust. These bind him to sharing any derivatives with the Trust for further dissemination. Those who wish to go commercial with their product have to make a one-time payment to the Trust, which is \$25,000 for developing countries and \$250,000 for developed countries.

Softwares in Simputer

Simputer is designed to be modular and extensible, and based entirely on free software from the Open Source Initiative. The use of free software also helps to remove the use of proprietary software and their related cost. The primary input of Simputer is a touch-sensitive overlay on the LCD display

panel. The device's software draws from many open source software projects, including the 2.4.18 Linux kernel, the Open Palmtop Integrated Environment (OPIE) for graphical applications and the web browser. The BEL-PicoPeta Simputers are powered by Linux and Malacca. Malacca is a revolutionary new interface for the Simputer that makes the combination a powerful, customer-friendly and full-featured machine.



To develop applications for the Amida, the developers have come up with Amida Alchemy development platform. It is a powerful application development suite for handheld and mobile computers. PicoPeta has unleashed a comprehensive and revolutionary toolkit for interface design and application development. The suite comprises development tools for rapid application prototyping and design, functionality frame-works, storage, visualisation and transfer utilities, text-to-speech engines, frame-work for multi-language support besides drivers, tool chains and a host of other tools. Most of Linux applications with minor changes can be ported on the Amida. The Simputer Trust makes this developer kit available for professionals. This would bring new applications on the Simputer platform.

Software for the least expensive Simputer supports Web browsing and email. The email client supports notes written by hand using a stylus on the Simputer's touch-screen. An auto update utility is also included for firmware updates. Software on more expensive Simputer models adds an MP3 player, photo album, games, movie player, e-book reader supporting English and Kannada, and educational material. It also includes a budget planner, a 'paper' application for saving handwritten notes, a notebook with online keyboard, a Bhasha notebook supporting Hindi and Kannada, a spreadsheet called 'Katha', a voice recorder, calendar, conversion calculator, world clock, stopwatch, address book, and more.

Encore Simputer's main features include: text-to-speech synthesis in Indian languages, pen-based input (called 'tap-a-tap'), portable palmtop-sized footprint. To enable rapid development and deployment of application software, the basic development platform uses GTK. A Java Virtual Machine can also be provided for those application developers that want to benefit from platform independence for their applications.

The Simputer also supports popular network protocols such as TCP/IP (Transmission Control Protocol/Internet Protocol) and FTP (File Transfer Protocol). It features internet access and mail software such as a micro browser supporting Information Markup Language (IML), an extension of Extensible Markup Language (XML) for handheld computing. Since most of rural India is illiterate and will not be able to read the Simputer screen, the developers have come up with the IML. This enables the Simputer to understand several Indian languages by using a stored library of sounds. It then converts the text to speech, and reads out the information to the user. As long as the users can see the image displayed and hear what the Simputer is saying there is absolutely no training required. Therefore, Simputer is very intuitive and does not pose any complication

to the rural users. The IML browser in Simputer is named as 'imli'. No doubt that user can enjoy its taste completely! Doodle 'n' Mail feature in Simputer allows users to mark interesting points on any webpage and mail it to his friends. This feature is not present in any device including PC. These apart, gesture technologies that allow changing a page or zooming of an image by hand gesture, games and calendar features are available on the Simputer.

The Simputer Trust publishes the application programming interfaces (APIs) of the device to enable commercial and non-commercial software development around the platform. To spur software development around the device, a Simputer simulator and software development kit are made available free to developers. The system software of the Simputer is under General Public License (GPL).

So Simputer will be simple enough even for rural illiterate people to operate even if they cannot read the directions on the screen. First it is the simplicity of the device's interface. Each display page shows only a few possible commands that even illiterate users should be able to learn about the purpose of the icons and buttons on each page by trial and error. Secondly the presence of software that can turn text into speech. The Simputer holds a database of phonemes or basic linguistic sounds and from these it can generate an audio representation of any word. It will work for various Indian languages, including English, Hindi, Kannada and Tamil, allowing the Simputer to read the text aloud on its tiny built-in speakers. The software will be made available in other languages as well, depending on where the device is used. For example, works are going on to include French for France, Arabic for Middle East and Swahili for Africa.

Applications of Simputer

The Simputer has been designed so that it can be used by many according to their own purposes. For example, a farmer can use it to see the markets that will buy his produce at the highest price on a particular day. The Smart Card feature of the new system enables it to be shared by a community. Applications of Simputer may spread across the areas like micro-banking, online banking, rural commerce, micro credit applications, large data collection and agricultural information library. Its software is expected to aid farmers seeking to know commodity prices and beat middlemen. Implications of Simputer, in a country like India are enormous. Bill collectors, data loggers, health workers, educators, small and big businessmen, salesmen, researchers, householders and bureaucrats will all find uses for a Simputer. With customisable hardware and software, continuous upgradation of firmware and falling prices, Simputer could be the digital bridge for rural and urban people.

It also provides speech recognition in regional languages to help illiterate rural folk. The Simputer, which is operational in Hindi, English, Kannada and Tamil, ensures that illiteracy is no longer a barrier in handling a computer. The key to bridging the digital divide is to have shared devices that permit simple and natural user interfaces based on sight, touch and audio. Farm workers in Bolare, a village located southwest of Bangalore, India, already tried out a literacy tutorial program on the Simputer. Because the device can convert text to speech, it can help teach villagers how to read the local language, Kannada.

The post office in India, for example, is considering giving the Simputer to mail carriers who handle money orders. A



Encore Simputer

villager could send money through a smart card, plugged into the mail carrier's Simputer, for delivery to a relative on the other side of the country, downloaded to the recipient's smart card. This would eliminate sending money orders through the mail, where they are often lost or stolen. Health-care agencies in South Africa want to develop a small ultrasound monitor that could be plugged into the Simputer for tracking foetal development among pregnant women in rural settlements.

The Indian government is also interested in the Simputer for collecting reliable and timely information on agricultural production, a process now bogged down by inaccurate and slowly gathered paper documents. Pilot trials of the Simputer will be soon be conducted in e-governance and other enterprise applications. PicoPeta's first field trial is expected to start in Chhattisgar. About 75 Simputers will be deployed, one for each panchayat, in the district of Mahasamund. The project is funded by the South Asia Foundation and it is actively supported by the state government.

At the IISc, over 100 Simputers were given on trial where it did activities as diverse as creating a database on birds to monitor wireless radio equipment on ships. Currently, the Simputer is actively involved in two projects. PicoPeta has installed 20 Simputers in the Gulbarga Electricity and Supply Company for spot electricity billing system where nearly 30,000 bills are printed by Simputers every month. In the second project, 200 Simputers were deployed under 'Bhoomi', the land records computerisation effort. In Bhoomi, 200 village accountants use the machine in five districts of Karnataka to gather information on land records. In case of Encore, the Simputer is being used by the Dempo Mining Corporation at their weighbridges. Other applications include in areas of healthcare (patient records), e-governance (identity cards) and utilities billing.

Future of Simputer

The Simputer Trust believes the range of applications in Simputer will prove compelling. The Simputer is much versatile beyond the limitations currently seen in hand-phones, PDAs, smart-phones and laptops. The Simputer is designed to provide support for data and voice communications on internet protocols, enterprise applications access, secure transactions and personalized information delivery. As a smartcard application deployment platform, the Simputer is a secure, shareable, inexpensive and complete application access device. The Simputer is in short, the first ultimate converged mobile computing device.

However, the device does have some drawbacks. It is slow, taking about 15 seconds to boot up and often requiring several seconds to analyse the inputs from the user. It also sometimes crashes when it is left idle for a while, making it necessary to

Take your Tech notes

PDA : Personal Digital Assistant is consumer electronic devices that resemble small hand held personal computer (PC). But unlike personal computers, these devices perform specific tasks such as an electronic diary, carry-along personal database, calculator, etc.

CPU : The Central Processing Unit is the main "brain" of the computer, where the information is processed and calculations are done.

RAM : Random Access Memory is the temporary memory a computer uses to store data and process information. The more RAM a computer has, the more data a computer can manipulate. The contents of RAM are cleared when you turn off the computer.

ROM : Read Only Memory; a special type of memory used to store programs that start a computer and do diagnostics. Data stored in ROM can only be read and cannot be removed even when your computer is turned off.

USB : is an abbreviation of Universal Serial Bus. USB is a standard port that enables you to connect external devices (such as digital cameras, scanners, printers etc) to computers. The USB standard supports data transfer rates of 12Mbps (million bits per second). Aside from speed advantages, USB devices can be connected or disconnected without the need to restart the computer.

TDMA : Time Division Multiple Access (TDMA): A method of digital wireless communications transmission allowing a large number of users to access (in sequence) a single radio frequency channel without interference by allocating unique time slots to each user within each channel.

GSM : Global System for Mobile Communications. A standard for digital cellular communications which is adopted by over 60 countries. India is one of them. The GSM standard is currently used in the 900 MHz and 1800 MHz bands.

CDMA : Code Division Multiple Access (CDMA) is a spread spectrum approach for the digital transmission of data/voice over radio frequencies. Sound bits are digitized and the data is split into data packets that are encoded with unique identification tags. All of the data/voice is sent over a spread range of radio frequencies. The cell phone or data device receives all of the data packets but only re-assembles those packets with the correct code and transforms the broken-up bits of data into useful sound and data. This allows more traffic for a finite number of available frequencies than analog or the other digital standards.

BLUETOOTH : It is an open specification for seamless wireless short-range communications of data and voice between both mobile and stationary devices. For instance, it specifies how mobile phones, computers and PDAs interconnect with each other, with computers, and with office or home phones. The first generation of Bluetooth permits exchange of data up to a rate of 1 Mbps per second, even in areas with much electromagnetic disturbance. It transmits and receives via a short-range radio link using a globally available frequency band (2.4 GHz ISM band).

COMMUNICATION PROTOCOL : An established set of conventions by which two computers or communications devices validate the format and content of messages exchanged. Communication protocols can include sophisticated techniques for detecting and recovering from transmission errors and for encoding and decoding data.

TCP/IP : Transmission Control Protocol/ Internet Protocol (TCP/IP) defines how data can be transmitted in a secure manner between networks. TCP/IP is the most widely used communications standard and is the basis for the Internet.

reboot the machine. Also, powering the device may be a daunting task in areas that do not have a reliable electricity supply.

Of course, these short-comings may be removed and Simputer can be improved further. The subsequent version of the Simputer will offer speech recognition for basic navigation through the software menus. The speech dictionary will be customizable to support different languages. A text-to-speech system will also be developed to take the technology to India's illiterate population.

Discussions are also underway with several potential customers for licensing of the intellectual property and technologies including speech coders, VoIP stacks and modems. Encore would also embark on new development projects in emerging areas such as 3G wireless and Ipv6 (Internet protocol version 6). Steps have been initiated to re-organise the US subsidiary Ncore USA, to function more effectively as marketing front-end to take advantage of the current signs of economic recovery in the US.

An interesting application with the video camera is being worked out for the Simputer. This may make it a very low-cost reader for the blind. The visually impaired can use the video camera to scan text. The optical character recognition software then converts the scanned image into text that a computer can understand, and then the text-to-speech software converts that text into audible speech. So a blind person could use Simputer as efficiently as others.

The Simputer team are currently working to make enhancements like giving it an international style, greater memory and stronger battery power to make Simputer a radical simplicity for universal accesses. The Simputer has not been developed for profits and, thus, has not been patented and all intellectual property related to it has been transferred to the Simputer Trust. The information is available for those who want to improve upon it. The Trust decided to put the technology in Open Source to enable third party software developers and designers to add values to the platform. Therefore, it is hoped that with parallel contributions from developers all over the world, Simputer would overcome its current shortcomings and soon it will be considered as one of the best handheld computers in the world.

The future of Simputer depends on how well it is nurtured, by investment, by improvement, by developers' contribution and by acceptance. For the moment, it is one of the best tools the developing world has got. Dr. Muhammad Yunus, founder of Bangladesh's Grameen Bank, exudes that the Simputer 'will be an Aladdin's Lamp in the hands of the poor'. Kenneth Keniston, director of projects in science, technology and society at M.I.T., believes the Simputer 'should be more than adequate to meet any foreseeable computing, internet or web need in any developing nation within the next five or more years'. With all those enthusiasms and optimisms, Simputer will definitely find its place not only in developing countries but across the globe. However to achieve this, it must move on with the time. While congratulating the Simputer team for their visionary job, the Hon'ble President of India could visualise the future and therefore has put forward the following message for them: "...you have to constantly improve the product and make it competitive. The competitiveness has three dimensions, one is cost effectiveness, second is quality that what you specify that is what you deliver and third is deliver just-in-time when the market needs".

Interview with Vinay Deshpande

Dream 2047 : Simputer is a multi-lingual device - what are the languages it supports?

Vinay Deshpande: Presently, it supports Hindi, Tamil, Bengali, Marathi, Telugu, Malayalam, Kannada, Urdu, and of course English.

Dream 2047 : Can one transfer document/ spread sheet files from Windows platform to the Linux platform of Simputer and vice-versa? If yes, how?

Vinay Deshpande: Documents and Spreadsheet files can be transferred from Windows PC to Encore Simputer (and vice-versa) either through Hyperterminal (serial port) / FTP (USB cable) or through IrDA, using our SimpSync software.

Dream 2047 : Is text-to-speech conversion integral part of any Simputer?

Vinay Deshpande: Text-to-speech conversion is included into Encore Simputer on a need basis.

Dream 2047 : It is often told even illiterate people can use Simputer. Is it so? How is it possible?

Vinay Deshpande: The Graphical User Interface of this device is such that language / literacy ceases to be a pre-requisite for the operation of Encore Simputer. The user navigates through an icon-based menu (which breaks the language barrier) and confirmation from the device to the user, whenever so required, will be through text-to-speech (which crosses the literacy hurdle).

Dream 2047 : What is the price of a starting model Simputer?

Vinay Deshpande: Just under Rs. 10000 (inclusive of all taxes); with higher manufacturing volumes, the cost will proportionately fall.

Dream 2047 : Is Simputer readily available in a computer shop? If not, how can one buy a Simputer?

Vinay Deshpande: Encore Simputer can be ordered by writing to: simp-sales@ncoretech.com. It is not available in retail stores as we are not targeting it at the retail market.

Dream 2047 : What are the main features of the Simputer that will differentiate it with a PDA?

Vinay Deshpande: While the Encore Simputer has been designed for mobile computing, PDAs are designed to be lifestyle devices. The Encore Simputer achieves this by integrating a high-power computing platform with unique application enablers, multiple connectivity options and wide in-built peripheral support.

A PDA could be viewed as an Encore Simputer MINUS (read as integrated) smart-card reader/writer, USB master port, 56kbps modem and Compact-Flash (CF) card reader, and WITHOUT the local-language and text-to-speech capability.

The primary advantages of the Simputer over a PDA, in addition to the feature differences outlined above, are availability of on-board non-volatile memory for user data (implying that unlike a PDA, the user data are not lost in the event of the battery being discharged), and connectivity to numerous types of devices through USB and CF ports. Also, in an emergency, if the battery has discharged and there is no mains power available, the Encore Simputer facilitates usage of commonly available AA-size alkaline battery cells,



Vinay Deshpande

so that work may continue. With other PDAs, this is not an option and work comes to a grinding halt in such an emergency.

This enables the Encore Simputer to address an application space that is beyond the ability of a typical PDA. The Encore Simputer therefore expands the boundaries of information technology usage by addressing the needs of non-office domains such as rural banking, preventive health-care, local language education and mining.

Dream 2047 : Many people in a village can share one Simputer by using smart card - What is a smart card? How can it be programmed to make it personalized?

Vinay Deshpande: A smart card is a card that is about the size of a credit card and has memory capacity of upto 1 megabytes. Thus it could store several hundred letters, or individual bank account information, personal information - driver's licence, identity card with photograph, signature, and even a fingerprint.

The SmartCard is emerging as a credible delivery vehicle for financial transactions on the Internet and has become an important tool for electronic commerce. The incorporation of a SmartCard Reader/Writer in the Simputer increases the functionality of the mobile device for deployment of a richer set of value-added services, including services such as home and micro-banking through personal ATMs, home shopping, etc. The SmartCard Interface enables a diverse range of applications that require security. Electronic commerce, on-line banking, and multi-purpose citizen-cards will all require SmartCards in the near future.

The Simputer is targeted as a shared computing device for a local community of users. A local community such as the village panchayat or the village school, or a kiosk, or even a shopkeeper should be able to give this device out to individuals for a specific period of time and then pass it on to others in the community. This requires the device to be personalized for individual use on a dynamic basis. The SmartCard is again the basic method by which this device can be personalized. A user's individual profile and private data can be stored on a SmartCard, which he can carry around with him. Once inserted into the SmartCard slot in the Simputer, the personal profile and data are read from the SmartCard, and appropriate updates, if any, are made during the current transaction cycle.

Dream 2047 : What is the price of a smart card? Where villagers can get smart card?

Vinay Deshpande: Various kinds of smart-cards are available in today's market. The simplest form of card is used for secure storage only while the higher end cards are capable of computation. Depending on the features and memory capacity of the smart card, prices vary from about Rs. 40 to as much as Rs. 600 per card.

Dream 2047 : How Simputer can be connected with the Internet?

Vinay Deshpande: ● By making use of the built-in 56kbps Simputer modem via a telephone landline, ● By connecting a mobile phone (CDMA / GPRS) to the Simputer's USB port, ● Through a local area network (LAN) with a USB/LAN adapter.

Dream 2047 : Please tell us about the Simputer General Public License (SGPL)?

Vinay Deshpande: The SGPL allows any individual to download Simputer knowhow to build a Simputer for his or her own personal use, without having to pay any licence fee.

However, for those who want to use Simputer technology for commercial exploitation, a one-time licence fee is required to be paid to the Simputer Trust. Additional details are available from www.simputer.org.

Dream 2047 : Apart from Encore Technologies and PicoPeta Simputer, is there any other manufacturer who has been given license to produce Simputer?

Vinay Deshpande: No, the Simputer trust has presently licenced only these two companies to commercialize the Simputer.

Dream 2047 : What are the differences between BEL-picipeta Simputer (Amida) and Encore Simputer?

Vinay Deshpande: While both the Encore Simputer and the Amida Simputer from PicoPeta are based on a common Simputer technology, each company has made enhancements suitable for the market segments targeted by them. For instance, the power source for the Encore Simputer is two AA rechargeable Ni-MH battery cells, whereas for the Amida it is a lithium-ion battery pack. Some of the built-in features of the Encore Simputer, such as the analogue modem, are external options in the Amida. The smart card reader/writer is built into all models of the Encore Simputer, but not in all models of the Amida. Also, Encore offers a Compact Flash – II socket on some of its models, but the Amida doesn't offer any. Also, the Encore Simputer offers a built-in Java Virtual Machine, but the Amida doesn't. However, the Amida offers an accelerometer feature on one of its models, but the Encore Simputer doesn't.

Dream 2047 : How Simputer can be useful for the third world country, India in particular?

Vinay Deshpande: The uses of the Simputer are only limited by the user's own imagination, and there are literally hundreds of uses that it could be put to in a third-world country such as India. Such uses are in the broad sectors of e-Governance, education, and enterprise, with local language being the major factor. Literacy education, students' tool, microbanking, market information access (in fact, access via internet to all kinds of information), e-mail, voice-mail, entertainment (music and video), data collection, sales force automation, field service tools, delivery tracking, etc., are but a few representative applications.

Dream 2047 : Are you planning to have any field trial of Simputer to see its usefulness in rural India?

Vinay Deshpande: Several field trials have already been conducted in association with several NGOs and government organizations in rural India.

Dream 2047 : How is the response about Simputer? What is your future planning about Simputer?

Vinay Deshpande: Different models of the Encore Simputer to cater to specific market segments have been designed. Along with a developer's tool kit these models are expected to satisfy a vast range of customer applications. Encore has also delivered custom-designed Simputer solutions for large customers, that include hardware modifications and support. We will continue to track market needs, and evolve a family of Simputers to fit specific needs.

Interviewed by: Rintu Nath

Corrigendum

In the May 2004 issue of "Dream-2047". Dr. A.K. Goswami, was erroneously introduced as Director, Guwhati Planetarium, in the news item related to Venus Transit. Dr. Goswami is former Principal, Cotton College, Guwahati and former Director, ASTEC. The mistake is regretted.

Recent Developments in Science and Technology

Magnetic Fields May Be “Visible” To Bird

Migratory birds, as well as many other animals, are able to sense the magnetic field of the earth, but how do they do it? Researchers say, a fascinating possibility is that they may actually see the Earth's magnetic lines as patterns of color or light intensity superimposed on their visual surroundings. A paper published in *Nature* reports that the Earth's magnetic field is sensed by light-absorbing molecules in the retina of a bird's eye.

Any effect of the Earth's magnetic field on a photoreceptor's response to light is expected to be extraordinarily weak - so weak in fact that the possibility of such effects have been largely ignored. But animals have developed specialized visual systems. Some animals can see ultraviolet light. Some animals can see polarized light.

The new experiments reported took advantage of the fact that migratory birds held in “orientation cages” during their normal seasonal migrations use the magnetic field as a source of compass information to hop in the appropriate migratory direction. To distinguish between the photoreceptor and magnetite mechanisms, European robins orienting to the north during the Spring migration were exposed to low-level radio frequencies predicted to disrupt the energy states of any light-absorbing molecules involved in sensing the magnetic field.

In the presence of the radio frequency fields, the robins were unable to orient with respect to the magnetic field. This effect was also shown to depend on the alignment of the

radio frequency field relative to the earth's magnetic field. Virginia Tech researchers are currently carrying out related experiments to characterize the biophysical basis of the magnetic compass in insects, amphibians, and mice.

Source Nature May 2004

GM Plants require Less Nitrogen Fertilizers

Fertilizers containing nitrogen can boost crop yields tremendously, but the resulting agricultural runoff pollutes nearby waterways. If plants were more efficient at fixing nitrogen, the problem could be alleviated. According to the report, published in *Proceedings of the National Academy of Sciences* plants endowed with a corn gene absorb greater amounts of the element from the soil and can thrive under low-nitrogen conditions

Researchers led by Shuichi Yanagisawa of Okayama University in Japan engineered a strain of *Arabidopsis* plants carrying an additional gene, *Dof1*, which affects metabolism. The modified plants contained more carbon, amino acids and about 30 percent more nitrogen than control plants did. In addition, they grew well in soil containing one tenth the amount of nitrogen that normal shrubs needed to flourish. The scientists also tested the modification technique on potato plants and had similar successes. They thus posit that the *Dof1* approach could be applied to a wide variety of plant species and could suggest a means of lessening agricultural dependence on nitrogen fertilizers.

Source Scientific American.com

compiled by : Kapil Tripathi

VP News (Transit of Venus..) contd from page... 36

Some 360 telescopes suitable for viewing the Sun, Sun spots, planets and Interesting celestial objects were distributed to various institutions and schools through State Councils/Departments for Science & Technology. Reports indicate that the telescopes were used in a massive way to view the Transit Phenomenon in various parts of the country.

The feather in the crown of VP's effort was the live telecast of the Transit of Venus through DD National Channel. On June 8, 2004 between 10.30 AM and 12.30 PM with Prof. Yash Pal, Dr. Arvind Bhatnagar and Dr. V.B. Kamble as panelists and with Shri Girish Karnad and Smt. Aparna Vaish jointly anchoring, a live programme was



People watching Venus Transit through Telescope on June 8, 2004 at Technology Bhavan

telecast. Shri Kapil Sibbal, Hon'ble Minister of State (S&T and Ocean Development, Independent Charge) and Professor V.S. Ramamurthy, Secretary, DST, visited Nehru Planetarium and were interviewed during the live telecast. Vigyan Prasar supported the effort of Nehru Planetarium and the Amateur Astronomer's Association, New Delhi, for providing live feed of transit images to all the television channels. The discussions and comments by the panelists were enlivened with the live feed of images from Nehru Planetarium as well as short films edited out of the films made by VP, and live images of transit from several websites. The programme was re-telecast on DD Bharti on the same day. Further, Dr. V B Kamble participated as a panel expert on Zee News and DD News . Dr. T.V. Venkateswaran participated as a panelist in Jain TV. In addition, a number of lectures were organized in and around Delhi prior to Transit and a one day orientation programme for teachers was organized in Delhi.

Vigyan Prasar organized a live show on Venus Transit in Technology Bhavan, DST on June 08, 2004. Three telescopes with solar filters were deployed for the people to watch the transit. Over 200 people saw the transit directly through the telescope. Live telecast of Doordarshan National Channel on Venus Transit was projected on a big screen inside the Raman Auditorium. Photographs also were taken through the telescope and presented on a large screen. Films made by VP on Venus Transit were also shown in the auditorium.

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