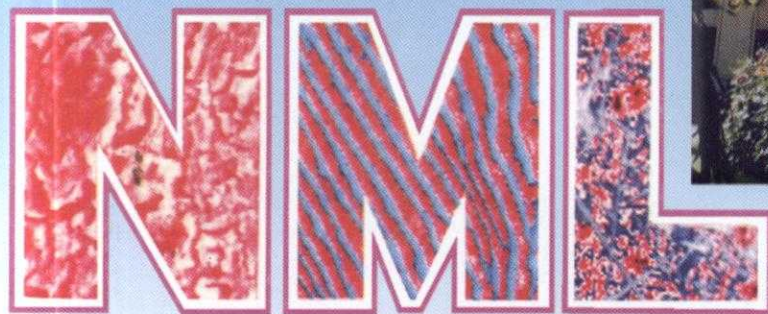




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NEWS



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CSIR Diamond Jubilee Exhibition in Jamshedpur City

In a bid to create awareness among the entrepreneurs and also to understand their problems in search of solutions and enrich the research agenda in the coming

decades, motivating student fraternity to take up science as a career, the Council of Scientific & Industrial Research (CSIR) organised for the first time in the steel



Top : Chief Guest Shri D. P. Rathore, Executive Incharge (Power) inaugurating the CSIR Diamond Jubilee Exhibition. On his right, Prof. S. P. Mehrotra, Director NML.
Bottom : NML scientist explaining the exhibits to the Chief Guest and other dignitaries.

Standard Reference Materials

NML has developed some special Spectrographic Grade Standard Reference Materials that promise to increase its export potential and thereby earn a sizeable amount of foreign exchange for the country.

The laboratory had so far developed 26 standard reference materials which were being used in organisations through out the country and overseas for ascertaining the quality of the products (steel, ferrous and foundry products).

NML's Certified Reference Materials (CRMs) are exported to Australia, Indonesia, Bangladesh and Germany. All these giving an annual business worth Rs.10-15 lakh, averaging more than Rs.1 lakh worth of revenue every month.

Some of the in-demand CRMs are carbon steel, cast iron, iron ore, ferro-silicon, ferro-titanium, manganese ore, limestone, brass, low alloy steel and nickel steel. NML has also developed CRM for ocean bed polymetallic nodules but that is not very popular because of the high

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city-Jamshedpur, a five day Technology Exhibition (7-11 May, 2003) at the premises of the Institution of Engineers' (India) at the pipe line area close to Jubilee Park. The exhibition was inaugurated by Shri D.P. Rathore, Executive in-charge (Power), Tata Steel and Chairman, Institution of Engineers' (India), Jamshedpur Centre. Among many other dignitaries CSIR's Jamshedpur based establishment, National Metallurgical Laboratory Director Prof. S.P. Mehrotra and several principals of local schools and colleges were present.

About 60 exhibits showcasing successfully commercialised CSIR technologies over the last 60 years were displayed at the exhibition. Among the exhibits, aerospace testing facilities, the herbal drug-Asmon, Amul-the baby food from buffalo milk, Magnesium metal, parallel computer processing, family planning drug-Saheli, Turmeric powder patenting, bamboo flowering breakthrough, tapping bio-resources, and creation of India's bio-future drew the maximum attention of the visitors. On the first day of the exhibition (May 7), the main focus was on CSIR's achievements in the field of aerospace. On 8th May achievements showcased with respect to *drugs and pharmaceuticals*; on 9th May with respect to *minerals and metals*; on 10th May with respect to *traditional knowledge base and Information resources*; on 11th May the special emphasis was with respect to *National Technology Day and CSIR's Diamond Jubilee celebrations*.

More than three thousand visitors including several scientists, engineers, industrialists visited the exhibition pavilion. Students and teachers from 47 local schools and colleges visited and interacted with scientists deputed from the National Metallurgical Laboratory (NML) on behalf of CSIR and were deeply motivated to take up science as a career. Local entrepreneurs, as well as from nearby cities visited the show and expressed their keen interest in some of CSIR's technologies. Representatives and officials from corporate houses such as Tata Steel, Timken India Ltd., Tata Refractories Ltd., The Tinplate Co. of India Ltd., Tata Pigments, Tata Rayerson, Telco and other small-scale industries took a



Top : Visitors going around the posters.

Bottom : Prof. S. P. Mehrotra along with other dignitaries keenly looking at the exhibits.

keen interest and visited the pavilion. Visitors at the exhibition were highly motivated and put up interesting queries. According to them the exhibition was very informative, especially the display materials were highly impressive. Students from local schools were curious to know more about the models and they studied the information very keenly taking great interest about the details.

According to Avinav Kishore – an industrialist “The exhibition was wonderful. I was not aware that CSIR is working in such large number of fields to develop India”. Another businessman Ujjwal Krishna said, “CSIR is really doing a good job for the development of Indian people”. An expert and consultant Vinay Krishna who accompanied his brother quotes “After seeing this exhibition I got to know about what India is capable of.” On the whole the student fraternity were more attracted to the various posters and displays exhibited. Ms. Aparna Roy - a senior teacher wrote – “It is really an eye-opener for all of us to be aware about

the innovation made by CSIR which is wonderful. I give my best wishes to all members of CSIR to help India for its upliftment. We are really impressed by the works of CSIR” Mr. Babulal, a retired technologist said, “Excellent presentation and useful to become an entrepreneur.” Shri Pulastya Ray, a student of class X wrote – “I like the things, which CSIR has done for us and in future I will also try to do R&D, like this.” Many more wrote to express their feelings. However, Mr. Harbhajan Singh, ex-inspector (QC), Tata Steel commented – CSIR's effort to hold such exhibition will be remembered in the years to come” touched the sentiments of many budding scientists of Jamshedpur City.

It was a very modest show, nevertheless it was well represented and well attended. The exhibition was a grand success in every way. On behalf of CSIR, the five day long exhibition was co-ordinated by Dr. N.G. Goswami, Dy. Director and Head, Information Management & Business Promotion Unit of National Metallurgical Laboratory, Jamshedpur.

CSIR IN THE SERVICE TO THE NATION

(High lights of the few Selective Technological Inputs)



A fighter and protector of India's traditional knowledge

Nation's emotions stir up, when rights are claimed on India's traditional knowledge. No one had protested against this so far – but CSIR decided to protest by challenging the patent given on the wound healing properties of turmeric, something known in India for centuries. The patent was revoked and this "Haldighati Ladai" as it is now known, became a landmark case being the first successfully such challenge of this appropriation through wrong Western patents. This victory has created a new awakening in the third world on the protection of its traditional knowledge.

Demonstrating technology as a job creator

The Terai region of the Himalayas smells of sweet success. Farmers in the region are now minting money with high oil yielding mint plants. Nearly 400,000 hectares of land are being cultivated by Kosi, Himalaya and Sambhav varieties of mint (*Menthol sinensis*) developed by CSIR. The pest-resistant and high oil yielding varieties have been adopted by 20,000 farmers and have generated 40,000,000 man-days of employment. India has now attained the distinction of being the largest exporter of menthol mint and its oil, displacing China to the second position.

Breathtaking breakthrough

ASMON, the novel herbal medicine for asthma, is based on CSIR's technology. Asmon blocks both asthma causing pathways. Unlike the commonly used steroidal drugs, Asmon has no side effects and is safe for all age groups. Its unique mechanism of action provides faster relief.

Major shareholder of new drug development

The Indian drugs and pharma industry excelled in process chemistry of known drugs – but created hardly any new drugs. CSIR showed the way. Eleven of the fourteen new drugs developed in India have

come from CSIR's stables. These drugs include anaesthetics, contraceptives, anti-malarials, anti-depressants and memory enhancers.

A contributor to Indian population control

Centchroman is a wonder molecule discovered and developed into a drug by CSIR. It is the world's first non-steroidal oral pill. It is also the world's first once-a-week oral pill. The pill can also counter breast cancer and osteoporosis. 2,00,000 women use this contraceptive pill every year.

New drugs to combat the tropical scourge

Thanks to the emergence of resistant varieties of parasites, malaria continues to come back with a vengeance, affecting nearly 2 million people today. There is no incentive for advanced nations to work on these diseases of the poor. CSIR has developed two effective drugs to combat malaria. Elubaquine is an anti-relapse anti-malarial quite effective against chloroquine resistant malaria. Arteether (E-mal), a drug that can combat cerebral malaria, is being exported to 48 countries today.

Combining traditional wisdom with modern science

There is now a growing realisation that the diversity and power and safety of bio-active molecules found in nature is far greater than the molecules created in laboratories for pharmaceutical use. CSIR has initiated one of the largest co-ordinated exploration programmes on drugs based on India's rich bio-resource and its traditional knowledge. This initiative involves 25 institutions including universities and traditional medicinal system institutions. This path-breaking programme has so far screened 23,000 samples and identified 44 potential bio-active molecules.

Creating India's bio-future

One of CSIR's first initiatives after its es-

tablishment was to begin documenting the rich resources available in India. The effort culminated in the Wealth of India, a 20 volume authoritative reference material. The first volume was published a year after Independence. The treatise has proved invaluable as an information source for economically important plants, animals, minerals and their applications.

Makes India proud with a first-in-the-world discovery

Bamboo flowers only once during its lifetime, and that too in twelve to hundred years. In 1990, CSIR scientists made bamboo flowering within weeks possible using tissue culture techniques. This astonishing breakthrough made news all over the world with the New York Times reporting this success on its front page, making it the first time ever for Indian science.

Creating Indian Genomic valleys

A novel recombinant oral cholera vaccine designed and tested safe for human use has been developed by CSIR. A natural streptokinase enzyme obtained through recombinant bacteria paved the way for indigenous manufacture of the drugs and enabled sharp price reduction.

Meeting the global challenge

First to analyse the genetic diversity of the most enigmatic tribes of Andaman and has established their own out of Africa 60,000 years ago. First transgenic *Drosophila* model for drug screening for human cancer. First US patent allowed for predictive medicine marker (SNPs) discovery for a neuro-degenerative disorder is of CSIR. First ever patent for commercialisation bio-informatic software has been granted to CSIR's PLHost, a software predicting the protein function and identifying drug targets.

A creator of unique knowledge alliance

When the alphabets of life, the first draft of the 3.2 billion human genome sequence was unravelled in 2000, the

CSIR in the service to the Nation



GLIMPSES OF THE VARIOUS EXHIBITS

opportunities to harvest this information for future health care were visible to CSIR. GenoMed, a knowledge alliance, first of its kind, was forged with an Indian pharma company with the highest knowledge fee in the history of CSIR reflecting the confidence of the private sector in CSIR. This pioneering public-private partnership was the first to realise the benefits from human genome research in the form of affordable healthcare for people of India.

Brings science and judiciary together

CSIR introduced DNA fingerprinting in India by taking the first steps to develop a novel probe from the venom of the banded krait to identify stretches of DNA. The technique became popular when it was first used in resolving a paternity dispute. The police now routinely use DNA fingerprinting to resolve difficult crime cases. The DNA test is now accepted as infallible legal evidence. The technique is also being used in wild life management.

Combating AIDS : Low cost HIV cocktail

There are an estimated 20 million AIDS victims world-wide. Their only source of succour is the anti-HIV cocktail. CSIR developed alternative and cheaper processes for the manufacture of these drugs and transferred the technology to CIPLA, who introduced this drug in India and other Third World countries at a fraction of the original price. CIPLA's aggressive pricing policy has not forced the multinational competitors to reduce their drug prices, but also opened up the issue of affordable life saving medicines to the poor at a global level leading finally to Doha declaration.

Pioneers the concept of parallel computing in India

In the 1980s, India was starved of computer power. Supercomputers from the West were either too expensive or simply not sold to India. CSIR therefore decided to connect several sequential computers in parallel to get supercomputing power. Flosolver, India's first parallel computer, was built in 1986. Flosolver's success triggered off other successful parallel computing projects in the country such as the PARAM. These denial driven

innovations led Washington Post to remark "..... and Angry India does it!"

Reverse transfer of technology to advanced nations

Catalysts are at the heart of a trillion-dollar industry. Multinational cartels have dominated this fiercely protected sector. In a remarkable display of Indian prowess and ability, CSIR successfully reversed the technology transfer process. Instead of the usual technology inflow into India, the cheaper, safer, longer-lasting zeolite catalyst technology was transferred out of India to multinationals!

First ever baby food from buffalo milk

During 1970s, all the baby milk was imported. India's request to some multinationals to set up manufacturing facility was turned down on the pretext that India does not have enough Cow's milk and that the buffalo milk has too much fat. CSIR stepped in to develop a process to manufacture baby food from buffalo milk with excellent digestibility and handed it over to the Kaira Milk Producers Co-operative Ltd. The co-operative began manufacturing and marketing baby milk food AMUL and made history. Seeds for the baby food industry were sown by CSIR.

Lending shoulder to the green revolution

The green revolution ushered in the 1960s depended heavily on hybrid seeds on one hand, and pest protection on the other. Indian production of pesticides was minimal and the programme depended on imports. Sensing the need, CSIR mounted an integrated programme to develop cost-effective processes for the manufacture of essential pesticides. Technologies for 25 pesticides were developed and transferred to 20 industries. Over 70% of 'new pesticide' at one time was based on CSIR know-how.

Responds to the slogan "Jai Kisan"

Independent India had to fill its granaries to feed its millions. Green revolution was on the way, but needed a lot of men and machines for agriculture. CSIR entered at this stage with SWARAJ, a 20hp tractor. Punjab Tractor Limited, a PSU, began manufacturing and selling

the tractors in 1974. Mechanised agriculture was ushered in. Today nearly 1,00,000 tractors are tilling the Indian soil. CSIR's latest contribution to Indian agriculture is SONALIKA, a 60-hp tractor.

India Mark II pump is found in almost every Indian village

Water being the basic necessity for survival, Government of India was looking for a simple pump that would work even in electricity-less villages. It had to be simple, easy to operate and maintain. CSIR provided the solution with the India Mark II pump. Made of non-corrosive non-metallic part, the low-cost pump has become an inseparable part of rural India. An estimated 30 lakh pumps are helping quench the thirst of Indians, and several third world nations.

Adding value to the farmer's produce

If green revolution ensured that farmers got their perspiration's worth, CSIR has been adding value and enriching their produce. Be it, products from abundantly available fruits and vegetables; machineries and techniques for processing of cereals and grains; high value products from spices and so on, CSIR has been there. In food processing sector alone, CSIR's technologies have been contributing to about Rs.800 crore worth production every year.

Contributes to national water security

Groundwater prospecting using resistivity and density contrasts. Simple to complex technologies to remove bacteria, viruses and chemicals. Commercial reverse osmosis and desalination units to produce 12,000 litres of water per day removing excess fluoride by "Nalgonda technique" Novel rain water harvesting schemes.

A national initiative to network stakeholders in the leather industry

Spread nation-wide in 17 states, Leather Technology Mission launched by CSIR had 170 programmes with about 60 NGO's joining hands. CSIR ensured sustained supply of skilled manpower to the industry by establishing 20 training centres. During 1990s leather industry was facing a storm. The High Court ordered

CSIR in the service to the Nation

several hundred tanneries to close down, as they were considered highly polluting. CSIR stepped in and 270 closed tanneries were revived and 250,000 jobs were saved.

Mining the deep sea for strategic metals

Source for strategic metals like Nickel, Cobalt and Copper at water depths of 4-6 Km. India first to get "Pioneer Investor" status from the UN. India gets mining right of over 1.5 million sq. km

Explorations in Antarctica

First expedition reaches Antarctica on 9 Jan 1982 India becomes one of the exclusive members of the Antarctic Club "Dakshin Gangotri" research station established 10 expeditions facilitated by CSIR Sixth in the World to develop and establish the acoustic sounder Several successful landmass and atmospheric studies and establishes Indian footprints on the icy continent

Promise of a near limitless fuel resource

Conventional gas deposits in India are limited and production has stagnated at 22 billion cubic metres since 1990. With fuel consumption rising rapidly, we face a very grim future scenario. Fortunately, gas hydrates –which are methane molecules, locked in a cage of ice crystals–offer extraordinary promise. It is estimated that gas hydrate reserves alone could meet international gas requirements for the next 300 years! CSIR has launched a major initiative to explore gas hydrates reserves off Indian coasts and preliminary studies are most encouraging.

Caring for the environment

Resource rich India has nearly one-seventh of its land barren, which include mine dumps, saline lands and fly ash dumps. CSIR has taken early initiatives in this direction. A coal mine spoil dump in Padmapur has been converted into a water body for aquaculture. A manganese mine spoil dump is revegetated into lush green forest at Gumgaon, Nagpur. Eroded lands have been turned into valuable assets through cultivation of non-traditional, oil-bearing Jjuba, Salicornia, Jatropha and Salvadora plants. In Gujarat,

more than 250 hectares of deserted salt pans have been reclaimed by planting about 6 lakh plants. CSIR turns dead Indian assets into productive land

Future heritage

Much before any evening news bulletin paid attention to the quality of air over Indian cities, CSIR had been watching and cautioning. In one of the longest surveys, CSIR had been studying the atmosphere of major Indian cities for 10 years and created an invaluable database. CSIR's exhaustive studies on modeling and simulation on auto pollution in cities has been the key to formation of the National Auto Fuel Policy 2002. When fluorosis struck regions of Andhra Pradesh, CSIR developed Nalgonda Technique to rid water of the offending fluorides. The Pollen Calendar for India prepared by CSIR is of immense help to asthmatics allergic to pollens.

Disaster management

Be it a ravaging cyclone or home shattering earthquakes, CSIR is the first to help the affected.

1991 – When earth shook Uttarakashi, CSIR went to build temporary quake proof shelters

1993 – CSIR designed precast slabs, planks and joists help provide shelter to 30,000 families affected by Latur earthquake, in just 4 months

1999 – Cyclone ravaged Orissa found CSIR rushed to provide safe drinking water in the worst affected district, producing 40,000 litres of water every day.

2002 – when the worst ever earthquake hit Gujarat, CSIR scientists rushed 30,000 packets of high nutrition food with traditional taste. When salt pans hit by earthquake turned out brown salt, CSIR scientists provided technology to manufacture good quality salt.

Disaster Investigations

Accidents do not always happen, they are also caused. The Bhopal gas leak tragedy in 1984, the Maharashtra gas cracker explosion in 1990, the bomb explosion in

the Kanishka aircraft in 1985 were all tragic national events. CSIR scientists investigated why these accidents took place by using powerful scientific tools – and explained how some of these mishaps could be prevented in the future. CSIR provides indigenous S&T strength for disaster investigations

Mine safety

In India, coal is extracted from underground mines several hundred metres below the surface. The roof of these deep underground mines has to be safeguarded from caving in. CSIR designed and developed diverse roof support systems such as open circuit props, hydraulic props, friction props, cable bolting and roof sticking systems that help ensure safety of mine workers. Numerous small-scale fabricators in the mine belt manufacture these Director General of Mine Safety approved roof systems.

The indelible mark

On a single day, during general elections, nearly 40 million people wear a CSIR mark on their fingers. The Indelible Ink used during general elections has been a time-tested gift of CSIR to the spirit of democracy. Developed in 1952, it was first produced in-campus. Subsequently, industry has been manufacturing the ink. It is also exported to Sri Lanka, Indonesia, Turkey and other democracies.

Creating wealth in the community Kangra tea : Back from oblivion

Kangra, a district in Himachal Pradesh for its 'green tea'. The plantations and the production therefrom declined over the years. CSIR devised techniques to revive and rejuvenate the plantations. Agro and harvesty practices were developed to suit specific conditions. Improvement processing methods reduced the withering time from 16 to 5 hours increasing the productivity. These measures cheered up the premium tea production from around 6 lakh kg to about 15 lakh kg.

Provides a strong base for civil construction

Over thirty percent of Indian soils have poor load bearing capacity and need remedial measures to build structures on

them. CSIR has developed novel pile foundations, under reamed piles, bored compaction piles, splice precast piles, skirted granular piles etc., suited for a variety of 'unfriendly' soils. Over 100,000 structures have been built using these designs.

S&T Manpower Development

Over 80,000 research fellows selected through a national competitive test have been CSIR fellows. Leading industrialists, technocrats, policy makers, diplomats and scientists have been its alumni.

World Class Education and Training

CSIR is the single largest global source for expert manpower for the leather and food-processing sector, with internationally recognised training courses. The graduates in leather technology occupy positions as policy makers and industrial leaders in over 65 countries, while those graduating in food processing technology are similarly placed in over 20 countries.

Helping India build a modern fighter aircraft

When the Light Combat Aircraft (LCA) soared into the skies for the first time in January 2001, it was a proud and exhilarating moment for the whole country. LCA is 'light' largely because of CSIR's innovative development of composite airworthy parts. When the unstable LCA engages in 'combat', the pilot in the cockpit will carry out his split second manoeuvre using the head up cockpit display and the sophisticated control software developed by CSIR with its partners. LCA technologies are extremely sophisticated and have dramatically narrowed the gap between India and Western countries in fighter aircraft design and development.

Creator of critical infrastructure of strategic importance

Well before India's plans in launch vehicles and missiles began unfolding, with a visionary initiative CSIR established a trisonic wind tunnel in the 1960's to catalyze aerospace research and develop-

ment! Every Indian aerospace vehicle, from satellite launchers to aircraft, has "graduated" out of this wind tunnel. CSIR has also developed a full-scale fatigue test facility to extend the airframe service life of India's fighter aircraft. Indian satellites and launch vehicles must pass through the CSIR-ISRO acoustic test facility to ensure that they can withstand the "big noise" during lift-off.

Making inroads in road technology

When it comes to construction of roads, all roads lead to CSIR, the fountainhead for planning, designing and devising road construction techniques and technologies that deploy locally available materials, skills and infrastructure. Be it the desert sands of Rajasthan or the rainforests of Assam; the icy terrain of Kashmir or the Expressways of Mumbai or the village roads of Mizoram, CSIR has left its mark everywhere.

Technology shift leads to dramatic energy savings

Choice of anode material is critically important for electrolytic production of caustic soda and chlorine. During 1970's Indian chlor alkali industries depended on metal and graphite anodes and suffered frequent replacement of anodes due to their dimensional instability. CSIR developed a novel titanium substrate insoluble anode (TSIA). The anode resulted in a power saving of over 12%. In over a decade almost kWh of power was saved due to the CSIR innovation.

Fuels the growth of industries

Diversity is the hallmark of India, which is also true of its reserves. Indian coals differ greatly in quality. CSIR's technologies have helped enrich poor grade coal for efficient use, with twenty-two coal washeries in India upgrading nearly 29 million tons of coal. The technologies range from coal washing techniques, desulphurising of low-grade coal, energy-efficient coking ovens and so on. They have helped to get high value, low sulphur coals for use in steel industry and thermal power plants and reduced

dependence on expensive and scare prime coking or imported coals.

The torchbearer of the Indian glass industry

In 1958 when War clouds were hanging on the horizon, India needed optical glasses desperately. Technology for optical glasses was guarded world over. CSIR took up the gauntlet and established its first glass-manufacturing unit. Since then CSIR has developed about 400 different types of special glasses for use in mirrors in telescopes, reflectors in satellites, tracking robot movement and also 'Radiation shielding Glasses' to provide protection from harmful radiations.

Refining refineries

CSIR's diverse technologies, from solvent extractions to catalysts, have made a nation-wide impact on India's petroleum refineries impacting on millions of tonnes of refined petroleum products. India's one hundred-year-old refinery at Digboi was rejuvenated using the most modern molecular distillation technology.

Status: corrected by DG; corrections incorporated 21.09.2002

Creating an Indian civil aviation industry

CSIR has designed and developed HANSA, India's first all-composite aircraft. The two-seater trainer aircraft had its maiden flight in 1993 and received type certification from DGCA in 2000. Five HANSA aircraft are already in the Indian skies. CSIR also has SARAS, a 14-seater, multi role aircraft on the anvil, which will set up the dawn of civilian aviation industry in India.

Caretaker of the country's measurement standards

Every second a beep can be heard on the radio of the short wave band frequency. This beep is a stirring affirmation of CSIR's diligent and omnipresent role as India's standards bearer. CSIR is the caretaker of all Indian measurement standards – in kilograms,

CSIR in the service to the Nation

metres, seconds or decibels. Such precision standards and measurements, traceable to international standards, allow the Indian industry to be globally competitive.

A rousing response to a technology denial

The Indo-Pak war of 1965, highlighted the strategic importance of the Magnesium metal. Magnesium, required for war-time 'flares', was in short supply and no one was willing to set it to India! In a rousing response to this technology denial, by 1975, CSIR had built a magnesium stockpile for the defence sector. In 1980, the technology was licensed to private companies all over the country. In 1990, CSIR technology was licensed to private companies all over the country. In 1990, CSIR won the WIPO Medal (1990) for development of magnesium technologies.

New Millennium Indian Technology Leadership Initiative Leading from the front

CSIR spearheads a movement to make India a technology leader in selected niche fields. NMITLI looks beyond today's technology and seeks to build, capture and retain for India a leadership position in the global arena based on technology by synergising the best competencies of publicly funded R&D institutions, academia and private industry. In two years 14 massively networked projects involving over 110 R&D institutions, academia and around 45 industry partners have been catalysed. This is the biggest Indian knowledge network so far, where private sector has participated. The projects cover a wide spectrum of technologies ranging from defunctionalisation of carbohydrates as building blocks for chemical industry of the future to flat panel liquid crystal systems, with switching speeds that are hundred times faster than the state-of-the art systems!

Preserving, protecting and adding value to India's knowledge system

CSIR masterminded the creation of digital archives of Indian traditional knowledge

by creating a Traditional Knowledge Digital Library (TKDL). This led to a Traditional Knowledge Resource Classification (TKRC). Linking this to an International Patent Classification (IPC) system will mean building the bridge between the knowledge contained in an old Sanskrit Shloka and the computer screen of a patent examiner in Washington! This no more wrong patents on turmeric, neem etc., from now on. TKDL, already accepted by 170 member nations of IPC Union of WIPO, has meant a paradigm shift for the entire developing world in protecting the traditional systems.

Pioneers convenience foods

In 1960s: The gulab jamun is practically invisible in South Indian homes where as in 1990s: The gulab jamun is almost ubiquitous in South Indian homes.

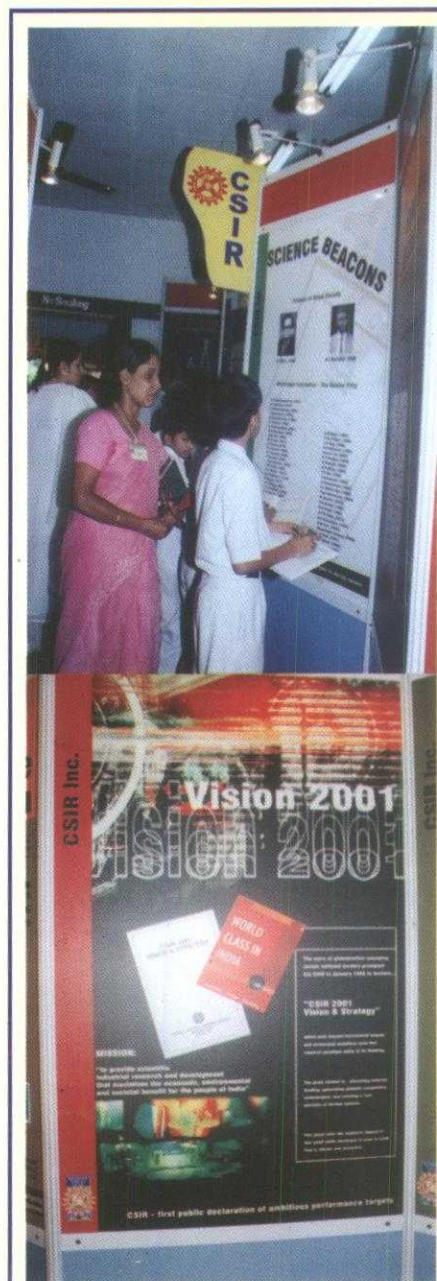
CSIR catalysed this dramatic transformation by ushering in convenience food technologies in a big way starting from the 1970's. 20 technology formulations, based on diverse Indian recipes, have so far been developed by CSIR. The "quick food" industry is today worth Rs.800 crores. Cultural gaps have also been bridged: idli, dosa and vada are now just as common in North India as gulab jamun in the South.

Lighting up the lives of poor

Nutan's is the story of how simple innovations save health, fuel and money across India. Nutan, an energy efficient, soot less stove, entered the scene when the inefficient wick stoves wasted fuel in soot or smoke. Developed through a CSIR Indian Oil partnership, the stove became a rage in Indian households during the 1970's. For the Nation, it was a saving of 20% of the fuel.

Making predictions that matter

Are we going to have a normal monsoon next year? Which areas of the country face the most serious earthquake? What caused the Bhopal gas tragedy? What reduction will be brought in vehicular-based pollution by altering traffic patterns? Questions such as these could be sometimes daunting. CSIR's prowess in mathematical modeling and simulation has helped answer several such questions over the years.



We believe in

- Team CSIR as a part of Team India
- Transparency and openness
- Adding value to the lives of Indians

We strive for

- Excellence in everything we do
- High science with high technology
- Customer satisfaction

Three qualities that distinguish us

- Innovation
- Compassion
- Passion

National Technology Day Celebrated



Chief Guest Mr. A. S. Mathur, President Usha Martin delivering the Technology Day Lecture

After the second Pokhran blast on May 11, 1988, India registered its name in the Nuclear Club of the world. This was the revival of the old technological glory of the country, which the country used to once boast of.

Since the Pokhran II blasts, this day is celebrated as the Technology Day. A programme to mark this occasion was organised at Jamshedpur-based National Metallurgical Laboratory (NML). The staff and members of National Metallurgical Laboratory observed National Technology Day on 12 May, 2003 at a function organised at NML auditorium. The day was celebrated to commemorate three technological feats—the Pokhran-II nuclear blasts, test firing of Trishul missile and the maiden test flight of Hansa-III.

Dr. S. Prakash, Head RPBD, introducing the chief guest, A.S. Mathur, President Usha Martin Limited, Jamshedpur to the august gathering informed that he was the mastermind of various modernisation and greenfield projects such as mini-blast furnace, steel melting shop and was the Total Productive Management (TPM) co-ordinator of Japan Institute of Plant Management, Tokyo.

Delivering his Technology Day lecture, A.S. Mathur expressed his gratitude for being invited on this occasion. He further added that India had been technologically advanced since the ancient times dating back to the days of Ramayana where the Puspak Vimana used by Ravana could have influenced the modern day aircrafts. The technology of constructing bridges was also known to the people of the country in that age, the bridge between

Rameshwaram and Sri Lanka is a solid proof for the scientific awareness.

Aryabhatta's contributions to the mathematical world was the milestone for the Western world. He also pointed out that Pandit Nehru, the first Prime Minister of India, had initiated many mega projects, which were successfully carried out. CSIR is one of India's largest scientific and technological establishments, initiated and nurtured by him. Mathur congratulated CSIR for many of its contributions in the field of science and technology. Describing the activities of Usha Martin, he stated that it is the largest producer of steel wire ropes and informed that the company would open a new plant at Dubai.

Usha Martin exports about 50 percent of its produce to various South Asian countries including China, he informed. He elaborated that in a conventional electric arc furnace, solid scrap is melted using electric power to make steel. Both scrap

and power are in short supply in India. He pointed out that Usha Martin was the first to have used sponge iron or DRI and hot metal from in-house mini blast furnace in its metallic charge in EAF on commercial basis. Now Usha Martin went on to put up DRI plant along with power plant.

He stated that there was a need of fine-tuning between the industry and research organisations. On this occasion K.K. Paul, Scientist, NML also made a brief presentation on the developments of Magnesium extraction technology. Dr. R.P. Goel, senior scientist of NML gave a short presentation on "Improvement on the productivity of the blast furnaces." He also outlined the important activities of this major work being done in NML. He informed that other than NML and Tisco, SAIL was also actively involved in the blast furnace activities.

In the end a vote of thanks was proposed by Rameshwar Dass, Controller of Administration. The function was attended by large number of Scientists from NML.



Dr. R. N. Ghosh, Sr. Scientist explaining the development of different technologies at NML to Mr. A. S. Mathur, President, Usha Martin

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New Projects

CSIR Network programme -

- Coal characterisation and resource quality assessment.
- Custom tailored special materials 4 projects under.
- Coal preparation and quality enhancement.
- Catering to specialised aerospace materials.
- Mathematical modelling and computer simulation.
- Capacity building for coastal placer mineral mining.
- Developing capabilities in advanced manufacturing technology.

Sponsored projects :-

- Creep rupture test for RLA for M/s Tata Power
- Failure analysis of swing pinion shaft for M/s Mahanadi Coal Fields Ltd.
- Assessment of boiler tubing based on stress rupture test for M/s Central Power Research Institute
- Selective bio-leaching of nickel using thiobacillus ferrooxidans for Dept. of Bio. Tech., (Govt. of India)
- Beneficiation of quartz and feldspar generated during mining of mica for DMRT, UP
- Studies of the magnetic properties of Fe-Si alloys developed at Vikram Sarabhai Space Centre (VSSC)
- Paint system for extended main-tenance free lie of steel structure for Instt. for steel development & growth
- Corrosion map of India for M/s Scott Wilson Kirpatric Pvt. Ltd. and Navayug Engg. Co. Ltd.
- Feasibility report for M/s Bhaskar Industries (P) Ltd.
- Consultancy on zinc dross supplied by M/s Usha Martin Ltd. for Usha Martin Ltd.
- Creep modelling software for Bharat Heavy Electrical Ltd.
- Opinion regarding deviation in metallurgical composition for Power Grid Corporation of India Ltd.
- Extraction of acid and iron values from the pickle liquor of steel for Dept. of Science and Technology
- Recovery of zinc from zinc dross for Tata Steel
- Synthesis of Ni based high value materials from low-grade stocks and secondary materials by solvent extraction for Dept. of Science and Technology
- Forging and rolling of Al-SiC composite plates for Regional Research Laboratory
- Recovery of zinc from industrial effluents using ion exchange for Dept. of Science & Technology

NML develops user friendly technique to identify CRS and MS rebars



Exchange of MoU with representative of M/s. SSNNL (on right side) for technology transfer with NML Scientist

NML has developed a technique for identification of Corrosion Resistance Steel (CRS) and Mild Steel (MS) of their use. Huge quantity of CRS bars are used in bridges, buildings, dams, canals and other concrete structures as reinforcement. Such rebars are more resistant to corrosion attack and are sold at higher cost than Mild Steel. It is impossible to ascertain the quality of rebars by visual inspection unless they are tested in laboratories using sophisticated instruments. This needs considerable time and experts' help and the site works can not wait for them. The technique developed at NML is simple, user friendly and does not require power or any sophisticated equipment. The testing of the steel can be carried out at the sites even by illiterate mansion. The technology is transferred to M/s. Sardar Sarovar Narmada Nigam Limited (SSNNL), Gandhinagar, Gujarat. SSNNL is a mega project of the country. The water collected in the dam at Narmada River will be taken to Northern Gujarat and Kutch area, which are drought prone areas. The Nigam is using about 100,000 tonnes of steel rebars every year for the construction of canals, bridges, tunnels etc. This technique is now successfully used by the Nigam to monitor the quality of their steel bars.

CSIR Diamond Jubilee Lecture



Dr. S.K. Banerjee delivering the lecture.

- The 4th CSIR Diamond Jubilee Lecture organised at the Laboratory was delivered by Dr. S.K. Banerjee, Director, Materials Group, Bhaba Atomic Research Centre, Mumbai on the Topic "Order and dis-order in Alloys" on May 1, 2003.
- Prof. K.T. Jacob, Department of Metallurgy, Indian Institute of Science, Bangalore delivered the 5th CSIR Diamond Jubilee Lecture in the series, organised by the Laboratory on May 28, 2003. Prof. Jacob Spoke on "Fuel Cell : Efficient Power Sources of 21st Century".

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cost involved in merely extracting the nodules from the ocean bed.

The international database for certified reference materials COMAR in Germany, developed to assist the scientists to provide information on the world-wide sources of availability of Certified Reference Materials (CRMs), has identified NML as one of the premier developers of CRMs in India.

The new standards developed by NML - the premier research laboratory of the CSIR in the country will take into consideration the very stringent requirements that have now become the hallmark in metallurgical sciences. Since material requirement today has become very specific, certain materials are needed which may be required in very small quantities but nevertheless make a very big impact. So, standards for that as well, is also needed. So far, NML has developed these new standards for carbon, sulphur, phosphorus, silicon, manganese and chromium. It is soon going to develop new standards for nickel as well.

The need for reliable measurements is becoming imperative as science and society are turning more complex and demanding and especially with the advent of the WTO regime. NML has been developing various CRMs for the last 30 years and now with the advent of instrumental techniques being used even by small industries there is an increasing demand for spectrographic standards.

At present, a majority of the requirements of standards in India is being met through imports from NIST (USA), BAS (Germany) and JIS (Japan). These standards are not only expensive but at times also do not conform to the matrix being used in the country especially for the standards for trace elements in plain carbon steel.

NML Participates in Shillong S&T Exhibition



Scientist explaining the NML products to student visitors.

NML participated in the S&T exhibition organised by the State Council of Science & Technology, Govt. of Meghalaya during 20-21 May, 2003. The exhibition was held at All Saints Cathedral Hall in central Shillong. R&D institutions including CSIR laboratories took part in this event. North Eastern Region of India, although rich in natural

resources, but yet to be brought under the industrial map of the country. The exhibition was put up with the aim to channelise the possible technology transfer of the available technologies of these selected participants to the targeted section of rural entrepreneurs and artisans of Meghalaya State in particular.

INTER INSTITUTIONAL TABLE TENNIS



Prof. S.P. Mehrotra, Director NML giving away the prizes. Sri Manjit Singh (Left) and Sri R. Raju.

In the public sector inter institutional table tennis tournament organised for the first time by NML Agrico Club on June 1, 2003, Sri Manjit Singh received the winner trophy in Singles. In doubles, Sri R. Raju and Sri. Manjit Singh jointly received the winner trophy.

Wishing a Happy Retired Life

Shri Saroop Singh, Gr.II(3); Shri Junga Kui, Gr.I(3); Shri R. N. Ghosal, Gr.II(4); Shri Suraj Nath, Gr.II(3); Dr. M. Bodas, Gr.IV(4); Shri Balbir Singh, Gr.II(4); Dr. S.K. Hembram, Asst.(G); Shri Charan Singh, Gr.II(3); Md. Moinuddin, Gr.II(4); Shri J. Pandey, Gr.I(4).