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BULLETIN

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CENTRE FOR POLICY STUDIES

(SANKAR FOUNDATION)



THE NUCLEAR DILEMMA

Public concern over nuclear weapons, disposal of nuclear waste and safety of nuclear reactors, is growing all over the world. The dangers of accident, miscalculation, incorrect computer-processed information, pathological traits among leaders and terrorists acquiring nuclear weapons are among the numerous threats which can no longer be considered imaginary. The human predicament is ably described by Spencer R. Weart in his book 'Nuclear Fear' thus: "Radio active monsters, utopian atom-powered cities exploding planets, weird ray devices and many other images have crept into the way everyone thinks about nuclear energy whether the energy is used in weapons or in civilian reactors." The Economist of January 4-10, 1997 cautioned that "Armageddon is no longer just a piece of Biblical symbolism; the end of the world has been an achievable, man-made possibility."

The big five nuclear weapon states—USA, Russia, France, Great Britain and China—have led humankind to the brink, not only by conducting over 2000 mega blasts but also by stockpiling nuclear arsenals which carry TNT enough to destroy the planet thirteen times over. The USA tops the nuclear test score board with a tally of 1032, followed by Russia with 715, France 210, Great Britain 45 and China 45. For these nuclear haves peace and stability depend on the pernicious theory of deterrence. A strong nuclear deterrence is still 'an essential part of American security policy.' The \$4 trillions America spent on nuclear weapons since 1945 and the \$20 billions she spends every year on nuclear deterrence have brought peace and stability to the world, feel the Americans. Russia, despite being overtly pro nuclear-disarmament, is as committed to nuclear deterrence as her main rival has been. China conducted an underground test less than a year ago only "to ensure the safety of its nuclear weapons." France thinks that nuclear tests, like weapons, add to 'French honour and status.'

The threshold states, some of whom are called 'rogue regimes' by the nuclear haves, are not sure whether possession of nuclear weapons would get for them a status on par with the big five, or would ensure security

for them in their region. The world is heading toward nuclear anarchy, marked by bullying and blackmailing. There is another dilemma for power-starved countries like India. If electric power is generated by nuclear reactors in many advanced countries, over 50% in France and 30% in Germany, why should these third world countries not make use of nuclear energy to overcome chronic power scarcity? How safe will these reactors be in hugely populated countries like India where accidents might lead to massive destruction of life and property?

Clearing the nuclear debris is no ordinary challenge. The United States will need to spend \$230 billions during the next ten or twenty years to clean up the contaminated sites from old test and storage sites and disused weapons and assembly plants. A Harvard study (see Economist, February 2, 1996) fears that Russia's nuclear bits and pieces will end up in unauthorised hands and the problem is how to ensure that fissile materials are stored safely and not recycled for weapon use.

The nuclear dilemma is essentially a human dilemma. Robert Oppenheimer, 'the father of the atomic bomb' was confronted with this dilemma. The blast, his genius caused, brought before his eyes 'the vision of the Divine Krishna suddenly growing to reach from earth to heaven, taking on a dazzling multicolored form with numberless arms and eyes, the numberless flaming jaws that swallowed the armies, saying "I am become Death, the destroyer of the world" Great scientists, like Oppenheimer, Einstein, Born and Bohr, who revealed the power of the atom, have warned us enough of the impending danger. It is for us to learn, from them and from history, and to act before it is too late.

—The Editor

"To smash the little atom
All mankind was intent
Now everyday
The atom may
Return the compliment."

—Max Born

NUCLEAR ENERGY – FRIEND OR FOE?

—Prof. M.N. Sastri

The highlights of scientific research during the last decade of the nineteenth century were the discoveries of the subatomic nature of matter, X-ray and radioactivity. The phenomenon of radioactivity was first observed by Henri Becquerel in 1896. This was followed by path-breaking studies by Madam Curie, Ernest Rutherford, James Chadwick, the Joliot-curies and other distinguished nuclear scientists, culminating in the splitting of the uranium atom in 1938 by the German chemists Hahn and Strassmann. This energy-releasing reaction has made available to the humanity, an immense source of energy and at the same time has become an object of both fear and hope.

This momentous discovery came at a time the war clouds were gathering over Europe. There were apprehensions about the possibility of Hitler's Germany developing the atom bomb "a weapon of untold force" based on the fission of uranium. To forestall this a number of nuclear scientists who fled from Europe, led by Albert Einstein, pleaded with President Roosevelt to order the development of the atom bomb expeditiously. As a result, the Manhattan Project came into existence. The first-ever atom bomb with an explosive power of 20,000 tons TNT equivalent was tested successfully on July 15, 1945 in New Mexico desert.

By this time Germany and Italy has already surrendered and beleaguered Japan began sending peace feelers. A soul-searching debate ensued among scientists and the army on the need for the use of the devastating weapon against the enemy who was facing defeat. Ultimately the will of the hawks in the army prevailed. The two bombs dropped over Hiroshima and Nagasaki killed thousands of people, mostly civilian, and totally destroyed the two cities. This episode clearly brings out man's urge to demonstrate his capability to ravage even when not warranted.

The end of the war marked the beginning of the Cold War and polarisation of the power blocs which launched upon a massive buildup of nuclear arsenals. By 1970-80, the total world nuclear striking power reached an estimated level of 10,000 million tons TNT equivalent. Compare this with a mere half a million tons of conventional weapons used during the Second World War, the most destructive ever fought!

"States going nuclear are like the children of Hamelin, marching blindly along behind their Pied Piper."

—George Kennan

* * *

"The splitting of the atom has changed everything, save our mode of thinking, and thus we drift toward unparalleled catastrophe."

—Albert Einstein

The world community began realizing the catastrophic consequences of a nuclear war. India took active role in the movement for total nuclear disarmament. A team of leading scientists led by the renowned Carl Sagan worked out the world scenario in the aftermath of a nuclear war. A condition described as "NUCLEAR WINTER" was predicted in which a major part of the planet's surface would be subjected to extensive destruction of life and property, pollution from radioactive fallout and destruction of the ecosystems, making it unfit for habitation for several years or even decades. According to one of the members of the team, "Nuclear war is an experiment that can be conducted only once."

The end of the Cold War was marked by the beginning of international negotiations aimed at nuclear disarmament. A number of treaties : START I, START II, NPT, CTBT and FMCT have either been signed or are at different stages of negotiations. But the bottom line of all these exercises is that the world is not going to be spared from the threat of a nuclear war in the immediate future. The nuclear powers have not only shown reluctance to agree to total nuclear disarmament, but are determined to exercise exclusive control over nuclear weapon technology for use as the ultimate tool of coercion and international diplomacy.

Beginning with the 1950's there was a phenomenal growth in industrial production, transport communications, and consumerism. All these activities are energy-intensive, oil, gas and coal – the non-renewable fossil fuels providing the energy base. With the rapid depletion of these resources, nuclear energy offered itself as the only viable commercial energy source. The first nuclear power plant for commercial generation of electric power went into operation at Calder Hall (U.K.) in 1956. By 1992, about 425 nuclear power plants became operational in several countries and about 50 were under construction, producing over 330,000 MW electricity. These nuclear power plants are not only claimed as the panacea for energy shortage, but considered more environment-friendly than the pollutant-belching (carbon dioxide, sulphur dioxide and fly ash) coal-based thermal power plants. In some situations, they were even considered as status symbols. But the two major nuclear reactor accidents at the Three Mile Island (U.S.) and Chernobyl (Ukraine), attributed to design flaws and operational errors, have completely shattered the public's confidence in commercial nuclear energy. Full details of the short-term and long-term effects of the more serious Chernobyl accident are yet to be unveiled. Meanwhile there are reports of possible risks from several nuclear power plants in the East European countries due to design flaws and poor management practices! Even some of the U.S. Nuclear power plants, which are considered best managed, are reported to be developing problems.

Information is now coming to light about the extensive pollution of land and water sources caused by nuclear reactors operated for weapon production in the

"The nuclear bomb is the most useless weapon ever invented. It can be employed to no rational purpose. It is not even an effective defence against itself."

—George Kennan

We live in an age of 'nuclear autocracy.'

—Michael Walzer

US and the former USSR. The costs involved in the decontamination of these sources are put at several tens of billion of dollars. Yet another major task concerns the safe storage of plutonium metal, described as the SATANIC SUBSTANCE, a product of nuclear reactors and the basic ingredient in a nuclear weapon. It is also the most toxic metal. With the availability of information even in the textbooks, the fabrication of plutonium bomb has become a simple task. A terrorist group or a rogue state which can gain access to a few kilograms of plutonium can assemble a bomb that can destroy an urban settlement. In fact such a danger is on the increase in the wake of frequent reports about the smuggling of this metal from the cash-starved Russian States.

The decommissioning of a nuclear reactor after it has served its useful life (which is of the order of 40-45 years) is another major task for which a satisfactory solution is yet to be found. Even after the removal of the highly radioactive fuel, the reactor has to be moth-balled under security for at least 125 years before it can be dismantled. Yet another critical issue for which a safe solution is to be found is the safe disposal of the highly radioactive waste fission products from the reactor without causing any long-term environmental problems. Meanwhile the buildup of plutonium and these wastes continues at the reactor sites.

Until foolproof solutions to these and related issues are found, the public can be understandably expected to entertain fears about the safety of nuclear power, despite the fact that it is the only viable alternate commercial energy source.

India is one of the few countries that have acquired considerable expertise in nuclear technology. Indian nuclear scientists have done commendable work in the application of nuclear technology for power generation and other peaceful purposes. They have also demonstrated, through the Pokharan test, their capability for defending the country through nuclear deterrence if the situation warrants. Ways of utilising this expertise for the well-being and prosperity of the country have to be shaped by the state. As far as commercial nuclear power is concerned, it will be acceptable to the public only if they are convinced that it is backed by perfect technology and sound management.

Apart from providing energy, nuclear reactors are sources of a variety of radioactive isotopes which find wide use in basic sciences, life and medical sciences, agriculture, engineering etc. In fact, some of the out-

standing developments in science and technology would not have been possible without these tools.

To sum up, nuclear energy can be described as a jinnie (genie), a spirit or demon in the Islamic folklore (Cf. Alladin and the Magic Lamp), capable of both good and evil at man's command. In the event of its failure to keep this jinnie on leash, "Humanity will get the fate it deserves" (Einstein).

(Summary of a lecture delivered at the Centre for Policy Studies on April 29, 1997).

"PROJECT INDIA"

Sri A. Sankar Rao, Managing Trustee, Sankar Foundation has made a donation of Rs. 5 lakhs to "Project India" being launched by Sivanandaguru Educational and Cultural Trust, Anandavanam, Bheemunipalnam. The project which aims to collect and preserve source material of Indian history and culture consists of :

- (i) Videograph of about 120 locations in the country including archaeological sites, ancient buildings, forts and castles etc.,
- (ii) Photographs of natural spots of significant beauty like hills, rivers and religious centres,
- (iii) An explanatory audio on the historic importance, puranic and cultural significance of these locations made out from the local traditions and available history records.
- (iv) Interviewing senior citizens in various walks of life not only to record their memories and views but also directions for future apart from preserving their personalities (audio-visually). This will include retired politicians, spiritual leaders, writers, scientists, artists and the average villager at random.
- (v) Interviewing responsible persons of famous institutions of past and present.

This will become a very rich store-house of source material for making audiovisual lessons for the student community as well as citizens. This will also enable us to collect lists of the published and unpublished books, records and manuscripts available in various libraries, archives etc. information on such libraries and institutions themselves, besides recording the fast disappearing archaeological structures. The project is being done under the total and direct guidance of Sadguru Sri K. Sivananda Murty.

POWER HUNGRY CIVILIZATION

—Prof. M.V. Venkata Rao
Head, Environmental Division

"The bliss of the touch of the one in the play of the many..."

—Tagore

According to the scientists the 'one' in the play of the many is energy. Energy and matter play together to keep

"I should like the House to remember that the use of atomic energy for peaceful purposes is far more important for a country like India whose power resources are limited than for a country like France, an industrially advanced country..... The question of international control becomes difficult. The United Nations cannot control itself."

—Jawaharlal Nehru

the universe going. Man, as the biggest player in the terrestrial ecosystem, equates power, which is the command over energy, with his supremacy. Thus more dependence on power means higher status to an individual or a nation in our technological civilization. Stress on lesser energy consumption is looked down as a poverty of philosophy or a philosophy of poverty. The elite can 'afford' the luxury of high energy consumption. But the time has come when the world can not afford the elite. The reasons are as follows : Fossil fuels constituting 90 per cent of energy resource for man, are non-renewable and are apprehended to last only for few decades at the present pace and trends of energy consumption. Renewable energy sources like wind energy, hydroelectric energy, biomass energy and solar energy are peanuts for the power hungry civilization. If atomic energy remains untouchable, due to its radio active contamination potential remaining uncontrollable, technological civilization has to a collapse during the next one or two centuries. The consequent turmoils are too frightening to imagine.

Breakthroughs in tapping new energy resources from nature do hold a promise. But sensibility demands preparing for the worst to precede hoping for the best. A frank introspection on the current patterns of energy consumption is an urgent need to arrest the deteriorating power crisis of the day.

The glamour of technology, hitherto, overlooked the possibility of resource crunch, particularly in respect of energy resources. As a result, industries which consume 40 percent of today's energy production, leave a large margin for improvement. Redundant mechanisations, promotion of consumer goods of imaginary or doubtful utility and automations inspired by technological snobbery have been flooding, drowning all sensibilities at times. With the bad experiences of industrialised nations and a better ecological awareness following it, the developing nations have to harp on the ecofriendliness of technology, in which energy conservation takes the top priority.

Next to industry, the transport sector is a big consumer of energy. 'Mad rush' are the best words to categorize today's traffic. Arbitrary transport of materials across the country without optimised distribution networks for various reasons, result in redundant haulages. Wrong siting of industries, necessitating long distance transport of raw materials and finished products adds to the problem. A coal based thermal power plant, while producing one

kilo watt hour of energy per kilogram of coal, is not unlikely to spend one kilowatt hour in transport and handling of the one kilogram coal, if the power plant is located faraway from coal mines.

Water way transport is known to spend 60 per cent lesser energy for haulage. Development of water ways has never attracted deserving attention of national planners. "Think big and act lavish to boost image," has been the guide line in choosing personal and public transport systems. Cars replacing trams, scooters carrying more commuters than buses, craze for jet speeds and senseless proliferation of committee meetings, conferences and delegations amount to ecological irresponsibility. The growth rates of public and private transport vehicles during the last two decades stand in witness to the irresponsible wastage of energy on transport, which accounts for 30 percent of energy consumption of mankind.

Domestic consumption of energy compares in magnitude with the transport sector. The tie up between social status and consumerism is carefully nurtured by commercial interests. The citizen is not tuned to focus attention on the ecofriendliness of consumer goods. Two models of the same article may be different in depleting the nonrenewable resources, in the magnitude of pollution created during manufacturing and the total energy input in manufacturing handling and transport. Ecograding of consumer goods by a competent agency, could provide guidance to the ecosensitive consumer at least.

Knowledge has produced technology with the good intention of enhancing national prosperity and the bad intention of destroying the apprehended enemies. Wars and fear of wars have been the catalysts in technological advancements. Thus technology has gathered qualities of domination, aggression, boastfulness and snobbery. Infusion of harmony, humility, humanism and love for nature into technological progress may hopefully rectify the ecological unsustainability of the power hungry civilization. The technocrat should deserve to be respected more as a mature human being than as a specialist of emence.

✦ FOUNDATION'S HEALTH PROJECTS

—Dr. G. Prabhakar
Coordinator, Health & Projects
Sankar Foundation

A report on the Medical and Community Development Programmes of the Foundation :

T.B. Programme :

As the W.H.O. puts it, T.B. not only kills more adults than any other single infectious disease, it also has a serious impact on socio-economic development, as 80% of the deaths due to it are in the most productive age group of 15 - 30. Sankar Foundation is striving hard in providing

effective regimens to suit different varieties of patients and their needs.

The details of the patients undergoing treatment for tuberculosis at the Sankar Foundation T.B. Clinics, are as follows :

No. of Total cases as on 30th April 1997 - 165

Males - 116 — Females - 49

No. of positive cases: 16		Age group :			
Bil.	PT	115	0 - 10	=	5
PT	(RT)	23	10 - 20	=	19
PT	(LT)	12	20 - 30	=	28
Primary		10	30 - 40	=	31
Others		5	40 - 50	=	44
			50 - 60	=	24
			Above 60	=	14
	Total	165			
			Total		165

Associations contributed to the above case load		Treatment completed : 30	
S.V.D.S.	55	7 to 8 months	28
Neads (Yelamanchili)	10	5 to 6 months	36
Yuva Sakthi(Munagapaka)	14	3 to 4 months	47
ORRC	15	1 to 2 months	9
Referrals		Treatment not given	
St. Josephs	12		3
Other clinics	59	Cases expired	3
	Total	Total	165

Recent press reports say that, at the meeting of the W.H.O. Programme Advisory group for the prevention of Blindness, the W.H.O. Director General Mr. Hiroshi Nakajima said that, nearly 150 million world wide suffer from significant visual disability. By A.D. 2020, the number of people over 60 years of age will almost double to reach 1.2 billion. Demography experts at W.H.O. have worked out that by A.D. 2020, there will be 54 million blind aged over 60, with 50 millions of them in developing countries.

The age related avoidable causes of blindness and visual disability include cataract as the major one.

Sankar Foundation is planning and cooperating with voluntary organisation for improving cataract surgical services in Visakhapatnam city and districts.

Sankar Foundation - Eye Hospital :

The Foundation's Eye Hospital has been launched at Srinivasa Nagar, Simhachalam road in a rented building. The hospital is fully equipped to conduct microsurgery for cataract with IOL implantation for all needy and poor patients, free of cost. The Foundation aims to conduct 2,000 IOL operations per year at the hospital. Many leading Ophthalmic surgeons have come forward to help the Foundation to conduct the operations, Dr. C. Madhavi, M.S., has joined the Foundation's Eye Hospital as full-time assistant ophthalmic surgeon. It is the great good fortune of the Foundation that Sadguru

Sri Sivananda Murthy garu, has graced the pooja function at the hospital premises and blessed the Hospital on 1st June, 1997. The formal inauguration of the Hospital and commencement of surgeries are scheduled for the third or fourth week of June '97.

The Foundation is conducting screening camps to identify and select people with cataract for operations. The camps are being conducted with the active cooperation of Voluntary Organisations.

Family Planning camp at Bheem Nagar : 10th March 1997

Sankar Foundation organised a Family Planning special incentive distribution camp at Municipal Corporation Health Service Centre, Bheem Nagar, Dr. S. Krishna Rao, In charge Chief Medical Officer, MCV was the chief guest and distributed seventy steel vessels.

T.B. Camp at Gopalapatnam : 13th March, 1997

A T.B. detection camp was conducted at Gopalapatnam with the help of Santhoshi Mahilabhyudhaya Samithi (A local voluntary organisation) and large number of women attended the camp for investigation and treatment.

Family Planning Camp at Araku : 14th March, 1997

Family Planning Special incentive camp was conducted at Araku Rly Health Centre on 14th March and distributed 100 steel vessels to family planning beneficiaries through the Rly Officers.

Family Planning Camps at Vidhyuth Nagar and Kapparada : 15th & 17th March, 1997

Family Planning special incentive camps were conducted at Vidhyuth Nagar and Kapparada Municipal Corporation Health Service Centre. Dr. J. Nageswara Rao, Medical Officer U.C.D. was the chief guest and distributed 140 steel vessels to beneficiaries.

Viswa Samakhya meeting at Anakapalli : 26th March, 1997

Sankar Foundation field team led by Dr. C.S.R.L. Narasimham Joint Director attended the Viswa Samakhya meeting at Anakapalli on 26th March, Dr. CSRL discussed about Foundation's activities and distributed survey forms to all N.G.O.'s.

"With a population of almost a billion people and their rising expectations, India certainly has to develop nuclear power in a big way, along with coal, oil, gas, hydro and non-conventional sources (wind, solar, etc.) from a long term perspective. The present emphasis on the 'market mechanisms' does not augur well for taking a long-haul view."

—M.R. Srinivasan
(former Chairman, AEC)

Visit to Upparla Village : 5th April, 1997

Dr. CSRL Narasimham visited Upparla village near Aganampudi, Vizag district through Mahila Chaitanya Pragathi Society for survey.

T.B. Camp at Anakapalli & Vaddadi : 5th April

T.B. detection camps were conducted at Anakapalli Gandhi Clinic and Vaddadi Z.P. School on 5th April, large number of people attended the camp for investigations and treatment.

T.B. Camp at Alchutapuram : 18th April, 1997

Sankar Foundation and Mandala Vikalangula Samkshema Sangham jointly organised a T.B. detection camp at Alchutapuram Z.P. School. 10 patients were selected for investigations and treatment.

Cataract Screening Camp at Alchutapuram : 18th April, 1997

Sankar Foundation's first cataract screening camp was organised at Alchutapuram with the help of Mandala Vikalangula Samkshema Sangham, Prof. V. Rajeswara Rao from Regional Eye Hospital was the Chief Guest. 115 patients were screened. Foundation distributed medicines to 50 patients and 12 patients were selected for cataract operations.

Cataract Screening Camp at Thumpala : 18th April, 1997

Cataract screening camp was conducted at Thumpala Village with the help of S.V.D.S. 35 patients were screened and 9 patients were selected for cataract operation.

T.B. Camp at Gajuwaka : 20th April, 1997

A T.B. detection camp was conducted at Gajuwaka with the help of Hare Rama Hare Krishna organisation and 20 patients attended.

Cataract Screening Camp at Haripalem : 12th May, 1997

The Foundation conducted cataract screening camp at Haripalem, near Anakapalli on 12th May, with the help of Nehru Yuvajana Sangham, Thimmarajupeta. 120 patients were screening and 32 patients were selected for operations.

T.B. Camp at Haripalem : 12th May, 1997

A T.B. detection camp was conducted at Haripalem with the help of Nehru Yuvajana Sangham a local voluntary organisation. 3 patients were identified for investigations and treatment.

Rama Krishna Mission's free service centre for Spastic Children :

Sankar Foundation is supporting the service centre for spastic children run by R.K. Mission. Many spastic children are being provided with treatment, physiotherapy and counselling at the centre.

Sankar Foundation - Indian Epilepsy Association Free Clinic :

Around 70 poor patients with epilepsy are being provided with medicines at subsidised cost at the centre.

Donations :

1. An amount of Rs. 7,800/- was contributed towards the cost of "Utsava Vighrahalu" for Sri Trimurtika Venkateswara Alayam at Seethammadhara, by the trustees.
2. An amount of Rs. 25,000/- was donated to Rotary Netra Eye Hospital at Saripalli Village near Pendurthy, towards cost of furniture for the Hospital.
3. An amount of Rs. 1,116/- was donated to Indian Trust of Human Resources Development, Gajuwaka.

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