



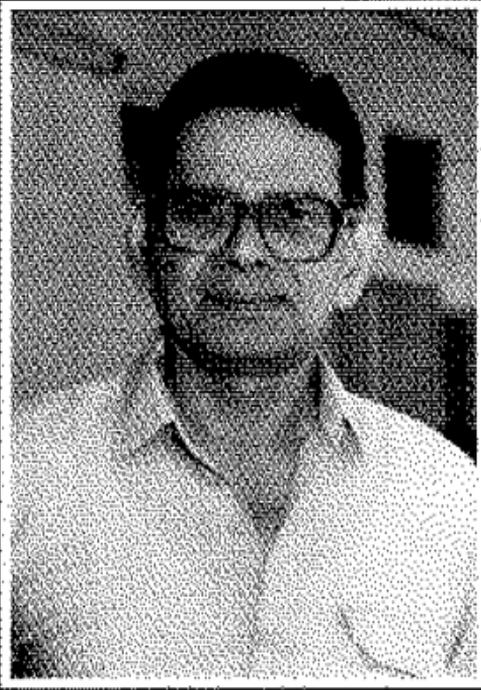
822 IN98

SULABH SANITATION MOVEMENT

Vision-2000 plus

S. P. Singh

822-1N98-15392



S.P. Singh is an old-time journalist who has worked for many news outfits, including UNI, Onlooker, The Motherland, The Pioneer, The Statesman and The Hindustan Times where he spent 20 years, functioning in different capacities to finally quit the job and joined the Sulabh Sanitation Movement. He is a writer, commentator and campaigner with sensitivity for social concerns. Doing human interest news reports, features and articles are the areas of his core competence.

Library

IRC International Water
and Sanitation Centre
Tel.: +31 70 30 689 80
Fax: +31 70 36 899 64

Papal blessing



"I will like to congratulate Dr. Bindeshwar Pathak who fully deserves this coveted recognition".

His Holiness Pope John Paul-II said it during "papal audience" to the Sulabh Founder at the Vatican on his being awarded the International St. Francis Prize for the Environment (*Canticle of all Creatures*) at Assisi, Italy, on Oct. 24, 1992 for "spreading the genuine Gospel inspiration that will yield the fruits of peace and goodness in the world".

SULABH SANITATION MOVEMENT

Vision-2000 plus

LIBRARY IRC

PO Box 93190, 2509 AD THE HAGUE

Tel.: +31 70 30 689 80

Fax: +31 70 35 899 64

BARCODE: 15352

LO: 822 1N98

S.P. SINGH

First Edition 1998

© Sulabh International
Social Service Organisation
All rights reserved

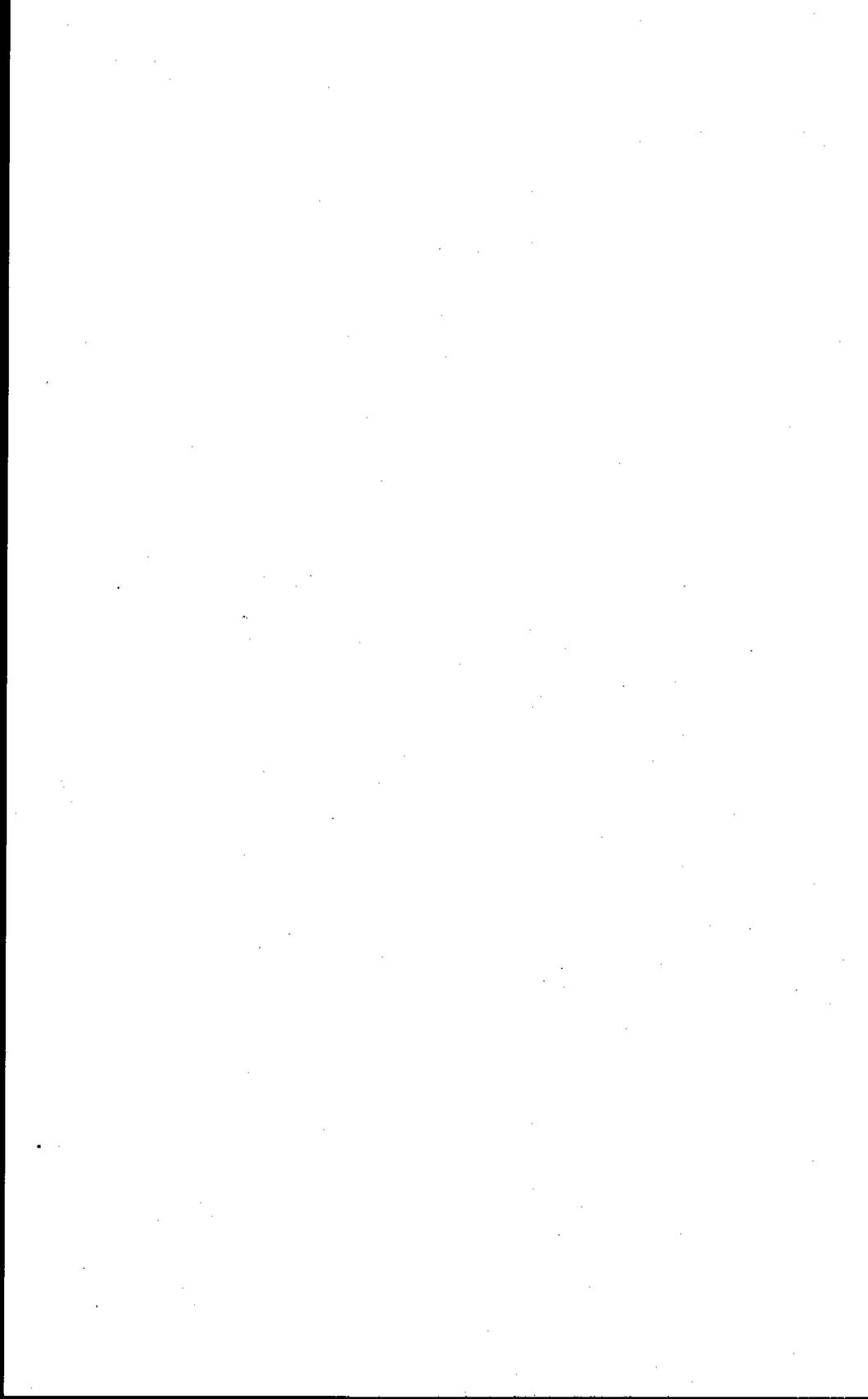
Art Director : Debabrata Chatterjee
Laserset : Anil Khanna
Page Make-up : Srinivas Mishra

Published by
Sulabh International Social Service Organisation
Sulabh Bhawan, Mahavir Enclave
Palam-Dabri Marg, New Delhi-110 045
Tel.: 5032617, 5032631, 5032654
Fax: 5036122, 5034014
Email: sulabh1@nde.vsnl.net.in
Website: <http://www.sulabhtoiletmuseum.org>

Printed by
The Printing Eye, New Delhi-110 046
Tel.: 5624179, Fax: 5611272

DEDICATED TO

**Sulabh social workers whose commitment and
good work inspired me to write this book.
People love this movement and Sulabh
volunteers love it more.**

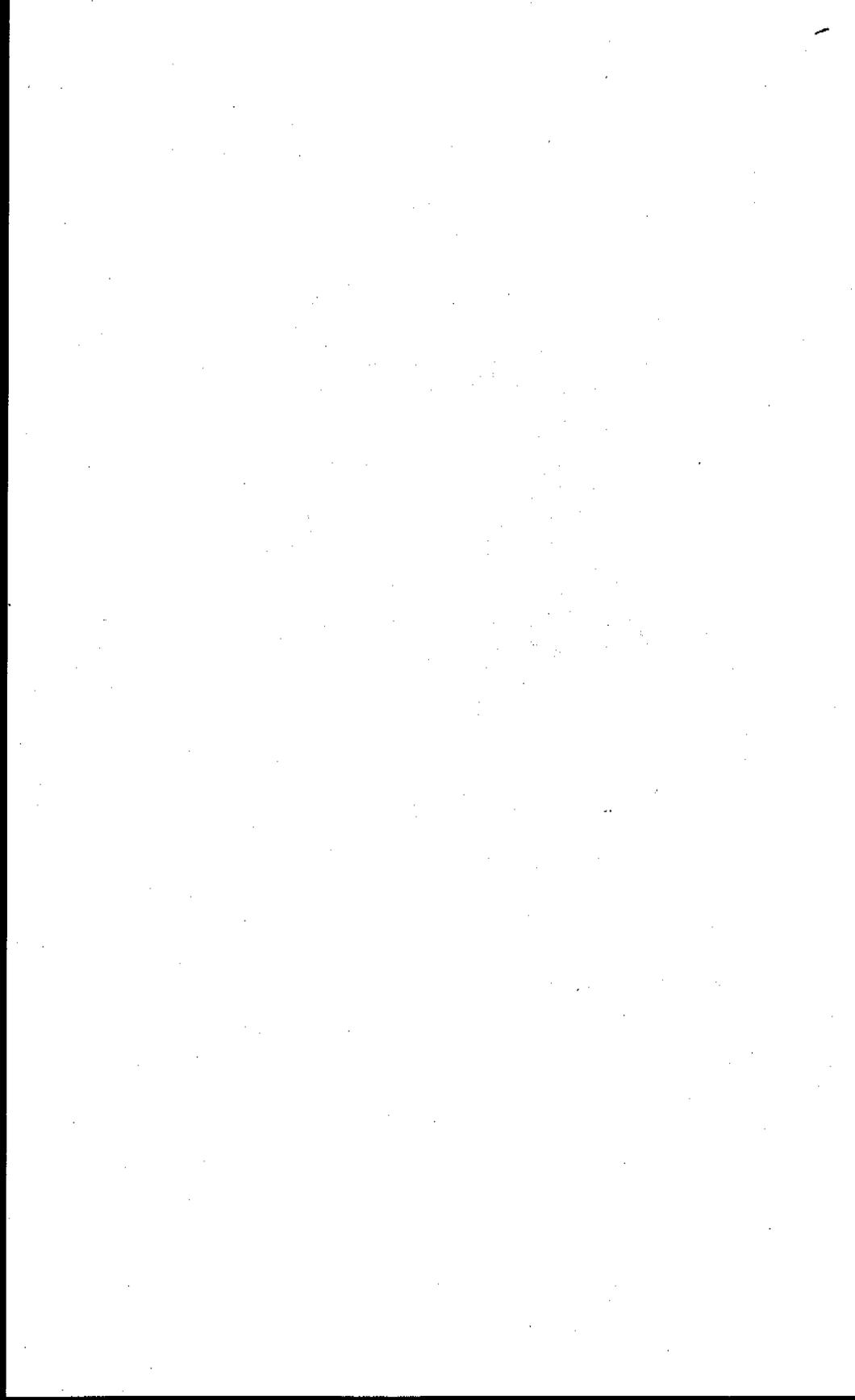


The only thing I know is the
fact of my ignorance - *Socrates*



...to see that Socrates
did not die in vain

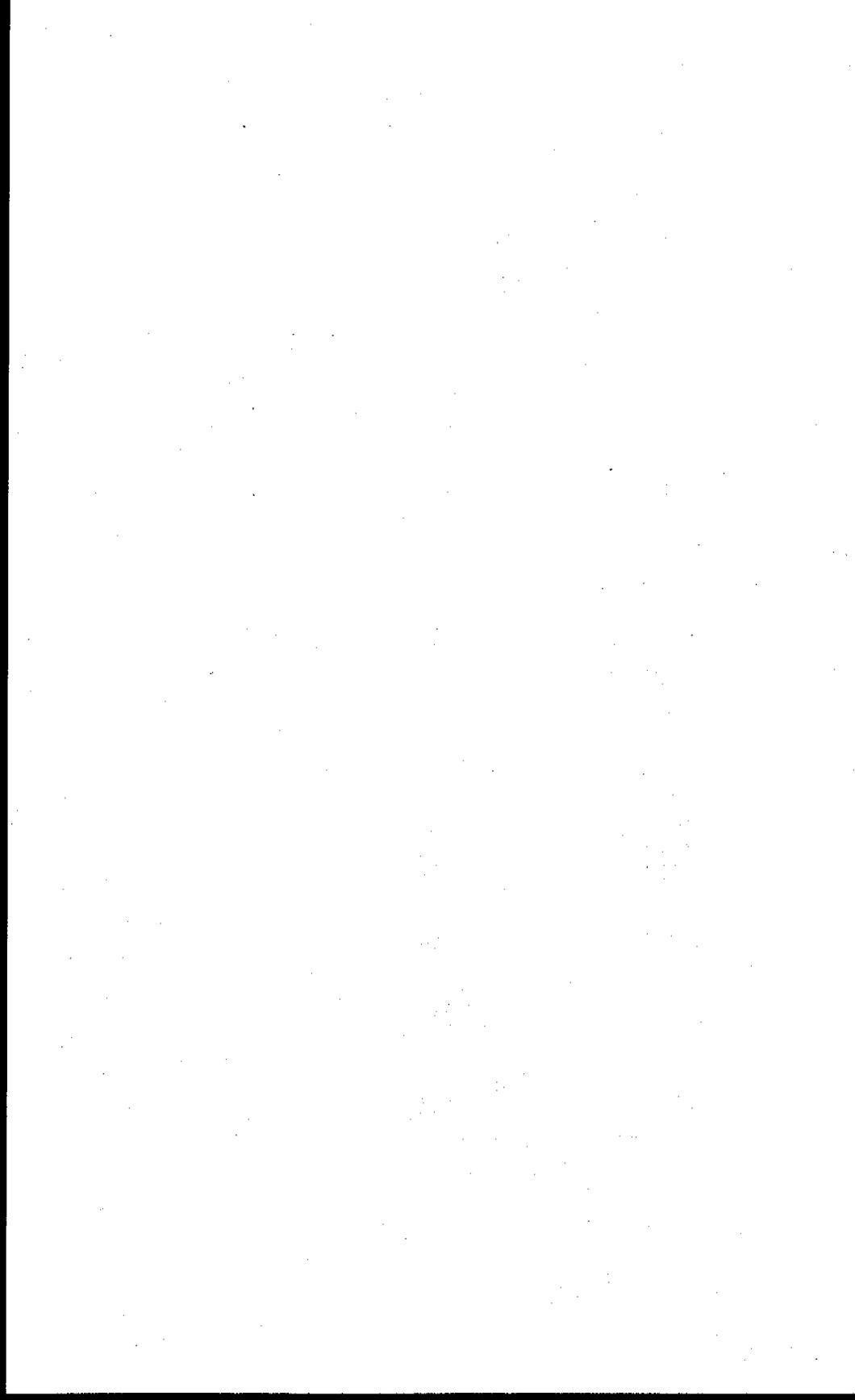
Caught between the vanishing past and the unknown future, man has been relentlessly working to find new frontiers of knowledge. Socrates, a patron-saint of pure and changeless ideas, died for the right to know truth by asking questions and awaken his fellow Athenians to their ignorance. Prophets, saints and scientists - all have asked the right questions which unlocked the mysteries of nature. As a matter of fact, from Socrates to the modern age, the human race has sought answers to fundamental questions in order to solve problems and make life better than before. Sulabh is one such effort.





*The village boy from
Vaishali asked for the
moon. And, very nearly
got it !*

Bindeshwar Pathak
Man behind the movement



Message

**Nothing is permanent
except change. - Herodotus**

Sanitation will be the top issue of the next millennium

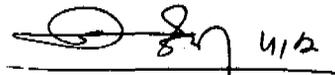
Fundamental to the mania that has gripped the humankind on the eve of the next millennium is the fear of how the future will unfold itself. And how differently. Atomic bombs, as Einstein has said, will be made in the backyard; war will cease to be an instrument to settle global disputes; there will be no national borders for the armies to defend - thanks to the revolution in information technologies - humans will be made to order; there will be a massive cultural fusion to produce a universal lifestyle, and the computer will discover God, possibly English-speaking and in striped suit. These and many more miracles may happen during a process of massive global change in the next millennium which nobody could dream of before. But most important things don't really change. Among them is the clean and healthy life which marks the modern civilisation of this century that has been amazing, inspiring and, at times, horrifying. But, always very fascinating.

The world's population doubled since 1945 and re-doubled many times over since Thomas Malthus predicted in 1798 that there will be a demographic explosion and death by war, famine and pestilence. The UN projection indicates that the world population will reach 11.2 billion by the mid-21st century. And almost all increases will take place in the developing countries whose urban structures will come under great stress. There will not be enough water to carry effluent, nor enough money to lay



costly sewerage system. In which case, deadly sanitation-related diseases may ravage the land and people. It will be a case of either good sanitation or deluge.

To be true, sanitation will be the most important issue of the next century – more important than any that mankind had to desperately address since the bubonic plague that came close to destroying the European civilisation in 14th century. Hence, let us start cleaning up the earth now, so that our children and children's children may live a cleaner and healthier life than we do. The Sulabh Sanitation Movement is one such initiative – environmental friendly and socially responsible. This book, closely reasoned and well-researched, is a visceral reminder that sanitation will be the symbol of happy and growing societies of the next millennium, waiting to be born anytime too soon.



(Bindeshwar Pathak)

Founder

Sulabh Sanitation Movement

Preface

The old nobility would have survived the French Revolution if it had known enough to become the master of winning ideas of the time. - Napoleon

The power of idea, this !

Ideas are time-bombs; they harm or benefit human beings. And, through them the world. They arise in the mind of a dreamer who may live anywhere, unobserved by the world and a group of disciples get captivated by his ideas and they spread them around. And, single snowflake becomes an avalanche, a breath of breeze grows into a hurricane. Ideas are not killed in battle, nor intimidated by persecution; they overthrow and build empires, cause revolutions and wars – until they too grow old and die and are replaced by new ideas. It is impossible to assess the power of ideas and their impact on the course of history. As a matter of fact, world history is the history of ideas – of their birth, development, decline and death. Ideas may not always be sensible but even the most absurd among them, like Hitler's racial ideology, could also be explosive. One doesn't really know how they work. A society may be destroyed or re-built by ideas conceived (or dreamt of) by some lonely, crazy or extraordinary persons, living in some remote corner of the world.

It is well to quote some cases. Charles-V (1500-1558) was King of Spain and Archduke of Austria who inherited the Hapsburg empire, extending across Europe. He was dreaming to extend his empire beyond the Continent to capture Constantinople, Jerusalem and Cairo. And, quite at the time he was close to becoming the *Holy Roman Emperor*, one of his councillors reported to him that a monk was quarrelling with the representatives of the Pope at Wittenberg over the question of papal rights. The mighty Emperor laughed away the idea, but the wandering monk was not to be laughed away. The divided States of Europe adopted Protestantism as their new religion and rebelled against Charles-V, who in sheer disgust, retired to a monastery to die a sad man. He was not 'defeated' by kings or captains in the battlefield but by an idea conceived by a monk, *Martin Luther*,

whose Protestantism became the dominant concept of Christendom.

Again in 1848, the Czar Nicholas-I of Russia was reading through the dispatches sent by his ambassador in London who had included, as a curiosity, the report of a recently published pamphlet, written in a tailor's shop by a German Jew, entitled *The Communist Manifesto*, which demanded a world revolution by the workers for the purpose of abolishing private property. Nicholas laughed at such a nonsense and wondered why England should tolerate impertinence of a *Jewish emigre*. He could not know that seventy years later, his own heirs and successors would be murdered and his empire captured by the disciples of this utopian dreamer, *Karl Marx*. This was the power of ideas.

This century was no different either. Around the globe that grew increasingly smaller, events pile upon events to make this century most intense in human history. Many great ideas - good and bad - happened in our time, greater than any before. The Industrial Revolution produced information age which demolished national borders; more scientific discoveries were made in this century than in the rest of history combined; achievements grew more epic and fame more worldwide than before. Max Planck produced Quantum Theory (atom emits energy in bursts) in 1900; Henry Ford produced car (1908); Wright brothers made gas-powered plane (1903); Einstein wrote General Theory of Relativity (1916); Alexander Fleming discovered penicillin (1928); Du Pont Co developed nylon (1930); Commercial TV was born in 1941; Alan Turing made electronic computer that resulted in an information revolution. Gandhi in loincloth demolished the largest British empire and a prisoner of South Africa, Nelson Mandela, became one of the tallest statesmen of this century. Truly awesome!!

Few would know that between 150 and 160 wars and civil conflicts have raged around the world since 'peace' broke out in 1945. Or that an estimated 7,200,000 soldiers were slaughtered in the process. That is the figure for deaths alone - not for the wounded, tortured, or mutilated. Neither does it include the far larger number of civilians sacrificed. Or those who perished in the aftermath of combat. Ironically, in the World War-I, the number of soldiers killed was only moderately larger: approximately 8,400,000. In terms of

combat deaths, the world has fought almost the equivalent of World War I all over again since 1945. When civilian deaths are added, the total reaches an astronomical 33 to 40 million – again, not counting the wounded, raped, dislocated, diseased, or impoverished. People have shot, stabbed, bombed, gassed, and otherwise murdered one another in Burundi and Bolivia, Cyprus and Sri Lanka, Madagascar and Morocco. There are today nearly 200 members of the United Nations. War has been waged in well over sixty of the member-countries. The Stockholm International Peace Research Institute (SIPRI) counted thirty-one armed conflicts in progress in 1990 alone. In fact, in the 2,340 weeks that passed between 1945 and 1990, the earth enjoyed only three war-free weeks. These and many many more ideas-driven events shaped this century that is coming to a close with great fanfare. The next century will also be wired, networked, global and ideas-based. It will be largely capitalist, a system which is efficient but cruel that can hurt the social fabric. The technology-driven human societies of the next millennium will be affluent in parts – competing and breathless.

Between and among these epic events and earth-shaking ideas, many little noticed events happened that also made enormous difference in the life of the people. Among them is the Sulabh Sanitation Movement which should be judged not by its pan-India (and beyond) spread, but also by the fact that it seeks to help the most defenceless people of society. Among them are scavengers. Human rights was a question born at Nuremberg post-War trial which produced many advocacy groups to defend the rights of the people to stay free from arbitrary arrest, persecution and oppression. But the Human Rights Declaration of 1945 does not take notice of the oppression caused by social inequity and flawed class or caste structure in which one man's (or class of men and women) exploitation by others has become an accepted fact of life. The oppressors and the oppressed both have accepted that. This skewed system cannot produce a war that Nazism, Fascism and Communism did. But in intensity of crime and suffering, it has been no less hurting.

A large number of social movements were launched earlier but they could not go very far. The Arya Samaj, Brahmo Samaj, Bhoodan and other movements also phased out with the passing away of their

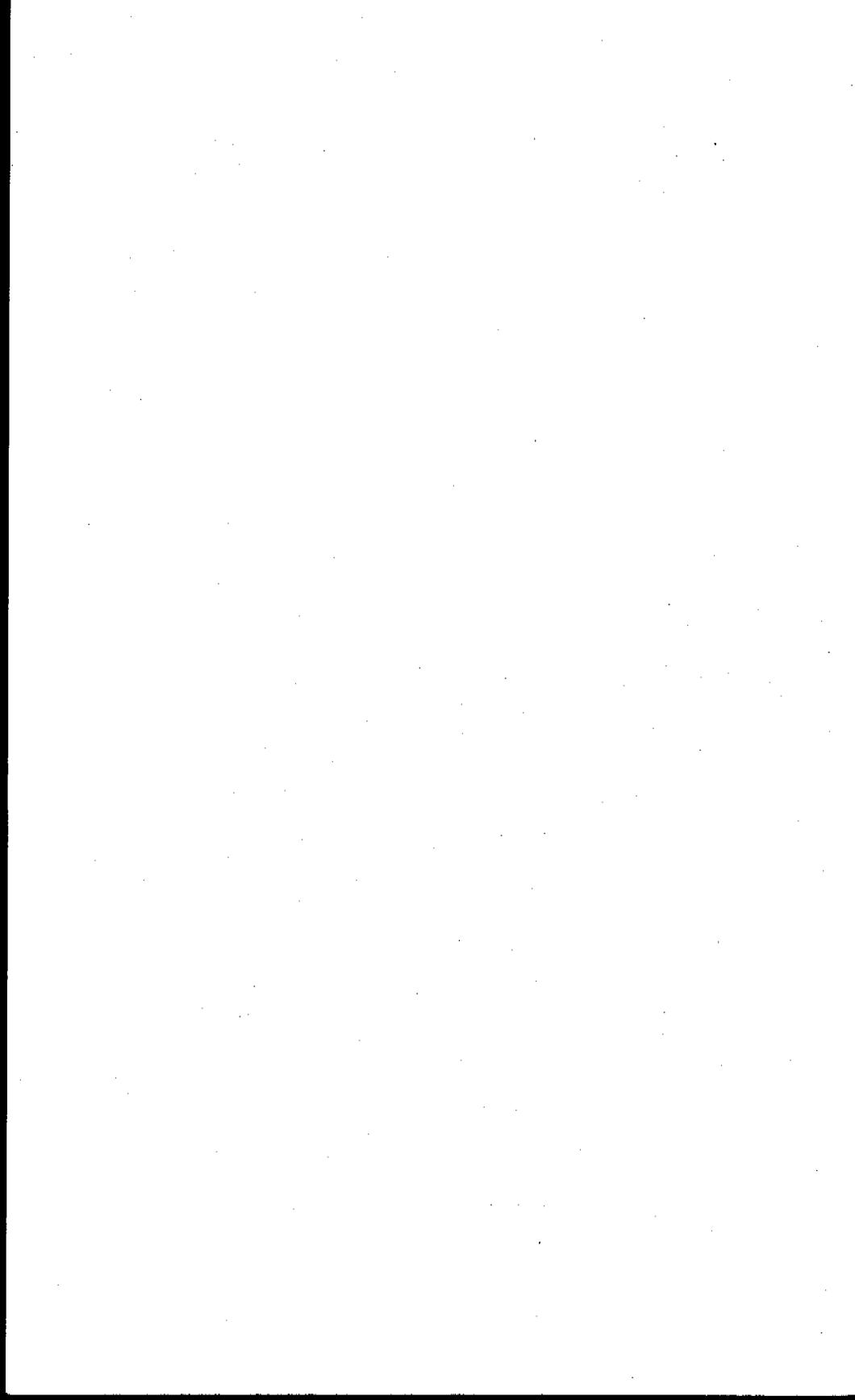
founders. The Gandhian movement had great social content but, finally, it remained political. After the achievement of Independence and the assassination of Gandhiji in 1948, the Congress, which was launched as a social reform party by a Britisher, Mr. A.O. Hume in 1885, became an instrument of power. All these social movements, however, were issues-specific and they could not gain full heights because they were too utopian, too starry-eyed and too quixotic to last forever. Nothing like the Sulabh Sanitation Movement had happened before. It is the first self-sustaining idea-based people's movement of its kind in the world where the concept of social change revolves round as mundane a thing as toilet which has always been considered too profane to discuss in public. Sulabh, for that matter, marks a paradigm shift because it is fundamental, technology-driven, value-based, global in sweep and country-specific in application. Sulabh is the largest human rights movement, outside the UN system. Dr. Bindeshwar Pathak's good work may not bring him sainthood, but this is what all good men and women will like to happen: a clean and healthy society growing with a sense of social accountability and equity. I leave it to scholars to take a closer look later at this great social and moral enterprise after the dust is settled and the battle is won.

When I started doing work for Sulabh in 1986, I thought it would be like any other job – reading, writing, and going home at the end of the day. But it was not to be. I could see a vast humanity suffering in various ways in their ghettos – a situation which I could not imagine adequately from the air-conditioned comforts of the newsroom. And, to live with scavengers and talk to them was a different experience. No less amazing was to meet the Founder of the Movement, Dr. Bindeshwar Pathak, whom I could see working overtime to stop scavenging and save scavengers through a variety of ways and new ideas, even when he could have stayed back home in comforts. The more I sought to discover the "catch" in the Sulabh story, the more elusive it became. Hence, I started writing notes on Sulabh which have finally been compiled, collated, added and added again to become this publication:

The Sulabh Sanitation Movement is one story presented in different forms, putting together all its components culled from the writings much of which by Dr. Pathak himself. Sulabh teams of

experts, volunteers, scholars, scientists and social workers have also written copiously on this social reforms movement, some of which has also been included in this publication. For that matter, this book is eclectic with so many stories woven into a colourful fabric. It could not be different either because Sulabh is a winning idea which is still unfolding itself in all its splendour. And, its parts add up to more than the whole. One does not really know what heights this concept will gain. Hence, I thought I should hurriedly put together what I know about the Sulabh Sanitation Movement, leaving for wiser men and women to improve upon it.

S.P. Singh



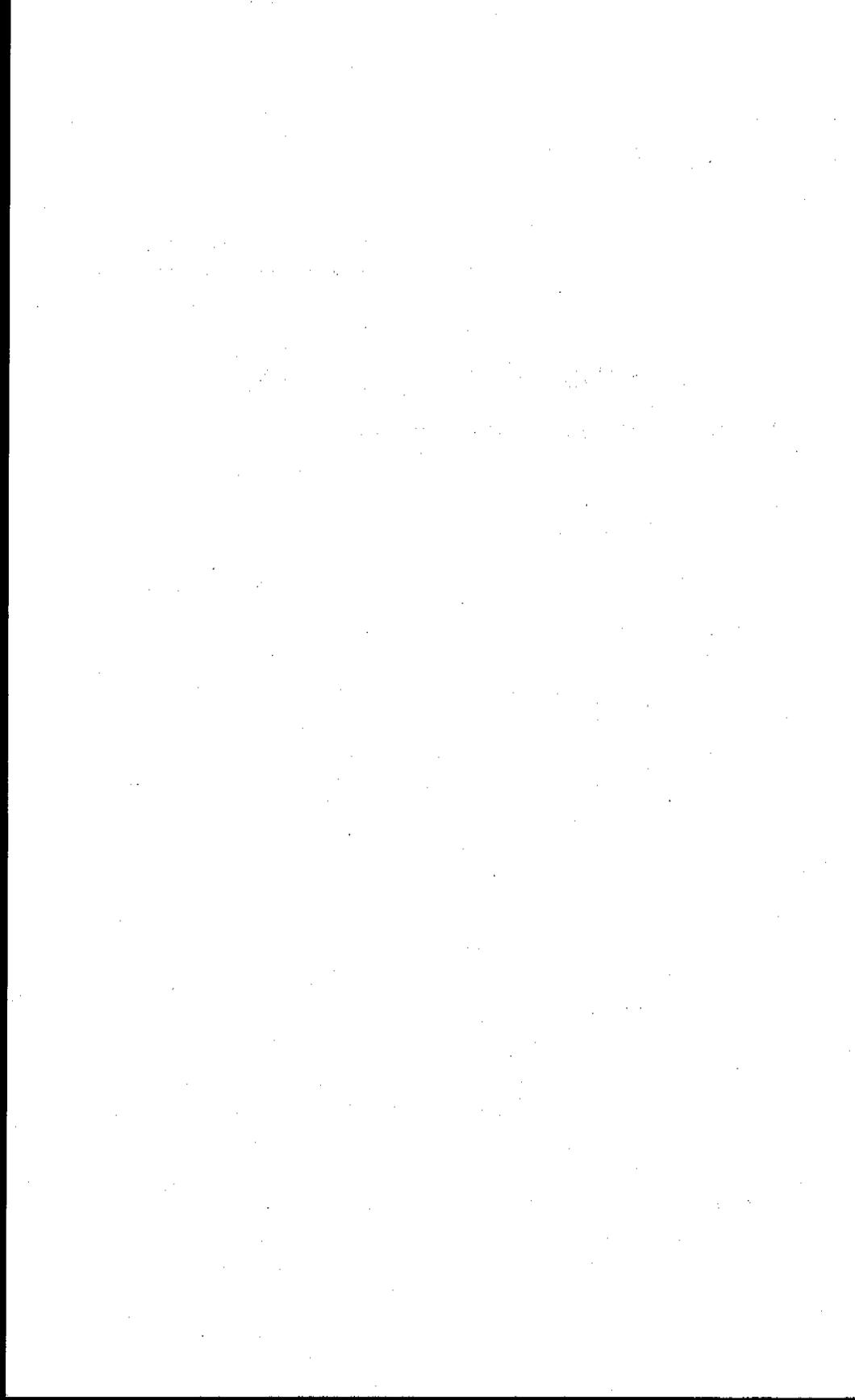
Sulabh in brief

**Knowledge brings with it truth,
honesty, fairness and democracy.**

- Paul Kennedy

A value-based and technology driven social movement

SULABH INTERNATIONAL SOCIAL SERVICE ORGANISATION, the largest nationally and internationally recognised pan-India non-profit voluntary social organisation, has 50,000 volunteers on its rolls who work to promote human rights, environmental sanitation, health and hygiene, non-conventional sources of energy, waste management and social reforms through education, training and campaign. It has developed a scavenging-free two-pit pourflush, safe and hygienic on-site human waste disposal technology; a new concept in maintenance and construction of pay-and-use public toilets, being used by about ten million people every day, and generation of biogas and biofertilizer produced from excreta-based plants. It has set up an English-medium public school in New Delhi and also has a network of centres all over the country to train boys and girls from poor families so that they can compete in open job market. Sulabh, thus, seeks to set up a modern and humane social order based on social justice and equal opportunity. The United Nations Centre for Human Settlements has recognised Sulabh's cost-effective and appropriate sanitation system as a *'Global Urban Best Practice'* at the Habitat-II conference (held at Istanbul, Turkey, in June 1996). The Economic and Social Council of United Nations has granted *Special Consultative Status* to Sulabh in recognition of its outstanding service to people, specially those living on the edge - socially deprived, underprivileged and disenfranchised. ●



Contents

| | |
|---|--------------|
| <i>Message</i> | <i>ix-x</i> |
| <i>Preface</i> | <i>xi-xv</i> |
| <i>Sulabh in brief</i> | <i>xvii</i> |
| 1. Sanitation systems grew with civilisations | 1-18 |
| 2. Origin and growth | 19-30 |
| 3. Concept and comparison | 31-56 |
| 4. A tale of two sanitation movements - Chadwick and Sulabh | 57-67 |
| 5. Areas of major initiative | 68-81 |
| 6. How small steps turned into a giant stride | 82-89 |
| 7. Sulabh Shauchalaya - A benchmark technology that drives Sulabh revolution | 90-101 |
| 8. The technology that Sulabh supersedes | 102-111 |
| 9. No groundwater pollution | 112-122 |
| 10. Case studies of small towns | 123-129 |
| 11. Magnitude of sanitation problem - a status report | 130-153 |
| 12. Sanitation - the unmet challenge | 154-156 |
| 13. Why sanitation fails | 157-167 |
| 14. Habitat and poor sanitation | 168-179 |
| 15. Poor sanitation costs lives | 180-181 |
| 16. Roman did it first | 182-183 |
| 17. Paris: Urban sanitation before the 20th century | 184-185 |
| 18. WHO fact-sheets on water and sanitation | 186-189 |
| 19. WHO update on declining environment | 190-192 |
| 20. Areas of research & development | 193-205 |

| | | |
|-----|---|---------|
| 21. | Dialectics of power – Sulabh networking system | 206-215 |
| 22. | Sulabh leads the growth of civil society in India | 216-226 |
| 23. | Survival of human civilisation turns on ecology | 227-238 |
| 24. | Ecological limit to growth | 239-252 |
| 25. | Media & environmental sanitation | 253-256 |
| 26. | Women are prime movers of Sulabh Sanitation Movement | 257-273 |
| 27. | Human rights – principle and practice | 274-283 |
| 28. | Sulabh promotes human rights – Scavengers who? | 284-292 |
| 29. | The disabled also have human rights to fight for | 293-295 |
| 30. | Of those who worked to improve sanitation since ancient time | 296-315 |
| 31. | A blow-by-blow account of sanitation movements in India since ancient time | 316-325 |
| 32. | History of evolution of toilets | 326-349 |
| 33. | For want of toilets, battles were lost | 350-353 |
| 34. | Mars mania grips 'toiletless' world | 354-355 |
| 35. | When plague ravaged Europe | 356-361 |
| 36. | History of plague in India | 362-365 |
| 37. | Dr. Bindeshwar Pathak - A Profile | 366-408 |

All great civilisations had developed toilet systems.

Sanitation systems grew along with civilisations

Civilisation literally means *living in city*. The word is derived from the Latin for city, *civitas*. The origin of the idea of a city was probably that of a citadel, a defensible stronghold into which people could retreat when threatened by invaders. Such a place might well be a steep, rocky hill, such as the Acropolis at Athens. The most suitable sites for settlements were beside watercourses, providing water both for drinking and a means of communication. The beginnings of civilisation lay in the valleys of the Euphrates - Tigris, the Indus and the Nile. For, irrigation, flood control and exploitation of the fertile alluvial soil could be maintained only by an elaborate community organisation. Hence, cities grew. The centre of activity in a Greek *polis*, (city state), was the *agora* (marketplace). With an increase in population and wealth, the irregular layout of the *agora* of the newly planned towns of Hellenistic times (mid-4th century) began to take a definite shape, expressing a new order in city life. We have to know the growth of major towns and cities in the world to be able to trace the development of various sanitation technologies which have now assumed an universal design in the sewerage system.

The late Hellenistic phase merged gradually with the Roman period. A Greco-Roman example, *Pompeii*, near the Bay of Naples (Italy) shows the *forum* (Roman version of the Greek *agora*) and civic spaces composed more symmetrically than was usual in Greek town planning. The Roman town layout had its roots in military encampments or *castra* (all towns in England with names ending in "chester" were at one time Roman camps). At an early stage, the Roman land commissioners evolved a system of subdividing towns into lots, based on two axial roads intersecting at right angles. The *cardo* (north-south) was often used for processions; the *decumanus* (east-west) was developed for commercial activities.

Early cities were military camps called *fustats* which were

built either in the vicinity of pre-Islamic towns, or completely isolated from the rest of the non-Muslim population. The fully developed Islamic cities evolved round mosque and *madrassa* (place of learning) which were also the religious and political centres of community. The market place was the focus of commercial and social life. The urban pattern was based on a controlled networking of roads and buildings. The growth of commerce and trade was the chief factor in the evolution of medieval towns. Regular trade routes developed between production centres and markets. Financiers and bankers remained in the town while merchants travelled about places. The mercantile basis of urban society and its economy helped free town-dwellers from the constraints of rural culture.

NEW GROWTH TREND

One of the most important Western merchant cities was Venice, created by a group of refugees from Malamocco on the Adriatic coast in the early 5th century. Salt pans on the small islands of lagoons were a lucrative export items which were exchanged for wheat with the inhabitants of neighbouring areas. By the 8th century, the groups of islands were



A relic that reminds of lost Roman glory.
Italy is also the land of Renaissance

thickly populated. Venetian trade expanded from the shores of the Adriatic Sea to Constantinople. Venetian ships traded wheat and wine from Italy, timber from Dalmatia and salt from lagoons for Byzantine fabrics and Asian spices. By the 10th century, treaties of commerce had given the Venetians a privileged status in the markets of Islam, with access to all the luxuries of the Orient. Venetian buildings and the irregular narrow footpaths of the city show a strong affinity with Byzantine and Moorish forms.

From the beginning, the shallow waters of the lagoons took the place of stone walls and fortifications. Venice was divided into six *sestieri* (neighbourhoods), one for each of the six guilds of the city. Each neighbourhood had its own local square with fountains, a school and a church. The Grand Canal, lined with large palaces, was closely attached to the local networks of neighbourhoods. The principal open space, *Piazza San Marco*, evolved from market place to political and social centre while local trade moved outward to the *sestieri*. The central open space became an important feature of many Italian towns. The Campo of Siena, laid out in the 14th century, is adaptable to many kinds of gathering and festival, notably the Palio or horse race through the streets of the town. The broad, fan-shaped Campo is surrounded by tightly packed buildings, with access by way of a maze of narrow streets.

RENAISSANCE PLANS

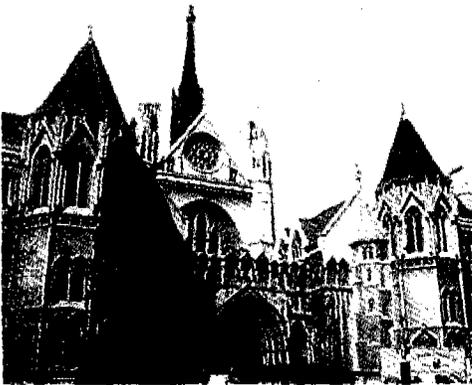
The elements of classical civilisation adopted by *Renaissance Humanism* changed the approach to design a more formal one. The discovery of the principles of perspective in the 15th century altered the conception of space, so that every element had to be related to the static viewpoint of the observer. The new type of street, with its imposing proportions and formal landscape, was often imposed on existing medieval forms. The hexagonal central piazza (market place) acts as an observation post from which the streets are seen in perspective. In Sir Christopher Wren's scheme for rebuilding London after the *Great Fire of 1666*, the streets, rather than the buildings, dominated the scene. Villas and their gardens were also designed in a single scheme.

The pattern of paths found in large landscapes, such as Versailles, was based on the same techniques as had been suggested for the layout of new towns. Sanitation did not emerge as a component of house planning. With the colonisation of the *New World*, the selection of sites for settlements became a major task of exploration. As European settlers entered the Caribbean Islands, Mexico and Central and South America in increasing numbers, Philip II of Spain in 1573 enacted the *Laws of the Indies*, which established uniform standards and procedures for planning towns and their regulations, including toilets. America's first planning legislation detailed the selection of a suitable site, the location of buildings, and the distribution of living areas. The

Laws were certainly among the most important documents in the history of urban development, and influenced the layout of many North American cities.

IMPACT OF URBAN GROWTH ON HEALTH & SANITATION

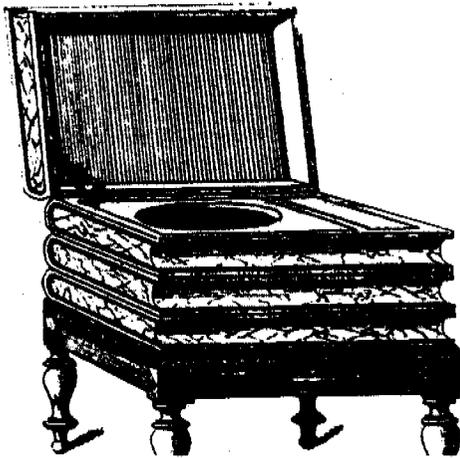
Health, like the weather or fortune, is variously defined. It may be thought of as the extent of an individual's continuing physical, emotional, mental and social ability to cope with his environment. The vague meaning of the word health can be traced all the way to its Anglo-Saxon root, which means hale, sound, whole. The experience of feeling healthy has always consisted in being able to function well, physically and mentally, and to express the full range of one's potentialities. The preamble of the charter of the World Health Organisation attempts to convey this utopian ideal in the following words: "*Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.*"



Ancient structures in London still exist with all modern facilities

Health economics is the study of effects of health (or ill health) and sanitation on the economy. Health economists attempt to measure economic effects of health services like hospital, sanitation, environment, etc. Sanitation services are normally rendered by government (central, regional, or local). It is justified by economists on the ground that the benefits are expected to accrue to society as a

whole and that these social benefits are greater than the benefits that go to individuals. Hence, community should pay for civic facilities, including toilets and bath. Similar arguments are used to support the case for collective provisions to contain diseases, including those caused by open defecation. The benefits from the treatment of a person suffering from diseases is not confined to individuals but extends to all. The special problem of financing sanitation service stems from the growing belief that people ought to live in good environment, regardless of their ability to pay. The



Commode disguised as stool with
books - French

preamble to the Constitution of the World Health Organisation states, "The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being." Many countries have provided for this right by legislation.

Many societies have responded to the problem of *medical indigence* by the provision of services on a charitable basis. In Europe and America, hospitals and

dispensaries were endowed by public subscription or by religious bodies to provide medical services for the poor. The physicians, working part time, in such hospitals rendered free services or received nominal payments. Some such hospitals were set up in the US. It was not until the 1890s that the extensively developed voluntary hospitals for acute disease in England opened beds for paying patients. In other countries, including Sweden and the former Soviet Union, government played a major role in developing hospitals and civic services. The physician has long been considered to have an obligation to society by rendering free medical service to the poor. Sanitation services were never free; it has been paid by the civic authorities who collected taxes to meet civic expenditure. The philosophy that society collectively gains from civic services has always prevailed with minor changes in different countries.

The social and urban changes brought about by the Industrial Revolution were rapid and unprecedented. Cities were founded and doubled in size in a generation, factories, roads, canals were built. Living conditions for the working class were appalling. Every available space was built over, courts and alleys were packed, with no regard for consequences. In some parts of Manchester, England, back-to-back houses permitted each person 3 sq. m. (34 sq. ft.) of living space, with no provision for clean water or sanitation. The *Public Health Act of 1875* set minimum standards for the width of streets and the construction, ventilation and sanitation, creating

a monotony of streets and houses still seen in urban planning. Some industrialists tried to provide better living conditions for their workers. A pioneering scheme in England was Titus Salt's model village of Saltaire, outside Bradford (1853). Other examples include the Krupp Works colony of Schederhof, Essen in Germany (1872-3), and Pullman city, Illinois, US (1893). The Garden Cities of Tomorrow (1898) by Ebenezer Howard offered a "healthy natural and economic combination of town and country life" that formed the basis of many later planning techniques. The growth of public and private transportation contributed to the expansion of suburbs. At the turn of the 20th century, more than 1 million people lived on the outskirts of New York. By 1928, 21 million motor vehicles were registered in the US. Other countries, where land was at a premium, developed policies for urban populations to new towns. Sir Patrick Abererombie's 1944 plan for London proposed rehousing 500,000 people. But, there were no provisions of toilets.

NEW CITIES – NEW CHALLENGES



Cloaca Maxima was Rome's first major sewerage system

The years after World War II saw a period of renewed urban development. Brazil built a new capital, *Brasilia*, planned by Lucio Costa and designed by Oscar Niemeyer. Tokyo, London and New York have achieved the status of "world cities", becoming centres of political, financial and commercial activities. The trend increasingly is for cities to become sprawling areas. While the developed world is preoccupied with increasing urban

amenities, cities such as Bogota, Bombay and Cairo are facing a different set of priorities. In Cairo some 150,000 migrants have to be accommodated annually and nearly all the poor live in



Faith healing in Middle Ages

substandard, illegally constructed housing. An additional 2 million dwellings will be required at spreading populations away from the congested centres. Urban growth is such that neighbouring metropolitan cities are approaching each other along major transport arteries to form a megapolis, as evidenced along both coasts of the US. The *Channel Tunnel* is linking Paris, Amsterdam and the Ruhr valley. Indeed, planning activity now extends beyond national boundaries, requiring coordination and urban

management on a vast scale. At the same time there are increasing pressures to retain the identities of individual cities through careful policies of conservation and rehabilitation.

The growth of cities demonstrate the qualities and failings inherent in the process of urbanisation. The consequence of development from the early beginnings of commercial organisation and the emergence of culture in Athens and Rome, to the rapid growth of metropolitan cities such as London, Paris, New York, Hong Kong and Tokyo, Washington D.C., laid out as a capital for a new and powerful nation, conveys the dynamic force of city development, from a clear site to a powerful government centre through the process of urban design. Other cities such as Prague, Florence and Jerusalem have resisted the full impact of dramatic change in their centres and have retained the traditional qualities of human scale. Others still, such as Mexico City, Istanbul and Moscow, have a glorious past but are now coping with unprecedented urban problems. Such cities have scarce resources to deal with the needs of modern development. Relatively new cities, such as Sydney and San Francisco have taken advantage of good locations, contributing to the quality of life for their multinational citizens. And, in these cities sanitation system is most modern.

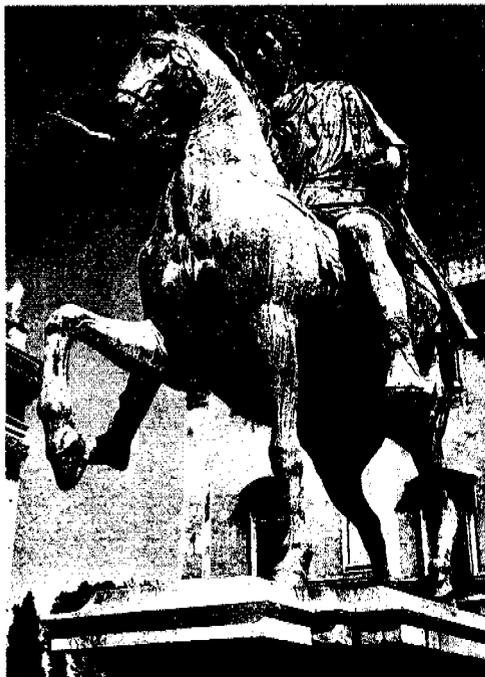
SANITATION IN OLDEN TIMES

Principles of health, hygiene and sanitation were developed by many pre-literate peoples. Presumably, whenever these matters were deemed to be of sufficient social concern, they received the coercive sanction of law, as well as the informal sanctions of custom or religion. The preservation of peace and order, conservation of manpower, sanitation and a desire to prevent offences that may provoke the wrath of gods against the community have been among the many objectives that were included in public health and safety laws. In Indian books of religion, it is described how far away from the habitat should people defecate into a hole which they should fill up after use. They have been the forerunners of what is termed the police power of the modern state.

As a matter of fact the history of health, sanitation and safety laws has been determined in large measure by the influences of religion and by political and economic forces. The public concern with the health problems of community life, the control of diseases, and improvement of environmental and sanitary conditions, such as the provision of food and water, medical care, and sewerage facilities, may be found in varying degrees in ancient, and modern societies also. Religious and health objectives were inextricably intermingled; for example, in dietary laws, the rules of hygiene and precautions against contagion have been specified in Indian books of religion and *Old Testament*, so prohibitions against consanguineous marriages and so forth. In the Western world, there was a close relationship between church and state until the Reformation and, for centuries, virtually all literate men were clerics which meant that most scientific knowledge was in their hands and, hence, subject to religious control.

The emphasis of the early church, priests and pundits upon spiritual matters and the belief that disease and death are the wages of sin long stood as major obstacles to a positive programme for public health, sanitation and social reform. On the other hand, the church and its religious orders did establish and maintain institutions for travellers, the sick, and widows. In India, temples had been the places for homeless, sick and the poor. Edicts on personal and social behaviours emanated from priests. It is only after the Industrial Revolution that cleanliness has been officially promoted and the control of priests loosened.

The Middle Ages (500 to 1500) saw a decline from the



Julius Ceasar was among the many Roman emperors who promoted sanitation to set a trend in sanitation manifest even today

standards of hygiene and sanitation of classical Rome. Although the world is greatly indebted to the Greeks for principles of personal hygiene and to the Romans for the development of public sanitation, there are records of elaborate sanitation schemes in even more ancient times. Ruins in the Indus Valley and Harrappa reveal that building codes were in effect and that sanitation engineering was far advanced as early as 4000 BC. Egyptian ruins dating from the Middle Kingdom (2100-1700 BC) include bathroom facilities and sewerage systems, as do those of the *Incas* in the New World. In addition to the formulation of principles of hygiene, the Greeks were responsible for the first attempt to show a relationship between environment and disease. The book in the Hippocratic collection served for over 2,000 years as the basic text on epidemiology and helped to sustain the *miasmatic* (contaminating-atmosphere) theory of disease until, the use of the microscope led to the discovery of microbes and the beginning of bacteriology.

The Romans saw a relation between swamps and malaria, devised crude respirators to protect workers from dust in the 2nd century and instituted a public medical service, built sewerage system and public baths, and engineered 14 great aqueducts. *And, when Nero burnt Rome, aqueducts survived.* They also built the first hospital and codified the health laws. Officials were appointed to maintain the banks of the Tiber, to guard the aqueducts against pollution, to inspect and maintain sewers, to destroy impure foodstuffs, to check weights and measures and to regulate public baths, brothels, and burial grounds. Justinian I set up quarantine posts and required certificates of health for

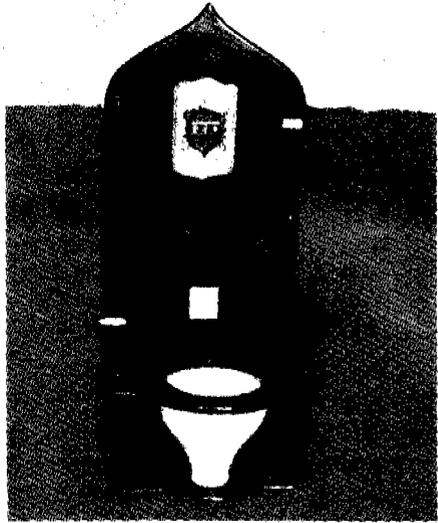
admission when one of the worst plagues in history broke out to Byzantium in 532.

After the disintegration of the Roman Empire there was a general decline in urban culture and with it began the abandonment of public-health measures. Byzantium (Eastern Roman Empire) became the cultural and medical centre of Europe and from there *Greco-Roman* medical knowledge spread to the Arab world, while in the West health problems were still dealt with largely in terms of magic and religion. During medieval times large monasteries had proper water supplies and heating and ventilation facilities but smaller buildings did not have any. And most medieval cities had a chronic problem in trying to provide sufficient supplies of non-polluted water and in protecting the public from disease.

During the Middle Ages, in England the *Common Law* concept of public nuisance provided a means for relief against some flagrant cases of pollution of water supply. Both in England and on the Continent, ordinances and statutes were enacted to outlaw some of the most prevalent threats to public health.

For example, Doua (France) in 1271, Augsburg (Germany) in 1453 and Rome (1468) forbade tanners to wash animal skins on the banks of streams, dyers to pour dye residue therein and the public from washing clothes in a river that served as a source of water supply. Early in the 15th century, several German

cities forbade the construction of hoppers facing the street. In 1185, the streets of Paris were paved to help keep the city clean. London had ordinances (1309) dealing with the disposal of sewage and excreta, and Milan from the 14th century had statutes, regulating cesspools and sewers. Most of these ordinances and laws, however, were only sporadically enforced and tended to become dead letters. The health measures that received the most conscientious enforcement during the Middle Ages were those



A replica of the throne of King Louis XII who defecated while giving audience to his subjects but dined alone



Police hunt for "nuisance-makers" - a sketch

pertaining to sale of adulterated or contaminated food and those providing for quarantine in the case of epidemics. Municipal authorities in many places policed the marketplace to protect purchasers of food. Inspection was practised and detailed regulations were enforced. For example Augsburg (Germany) in 1276 ordered, meat that was not freshly slaughtered to be sold at a special stand and the Florentines forbade the sale on Monday of the meat that had been on sale the previous Saturday.

Although epidemics were regarded by many as punishment for man's sin, the transmissibility of certain diseases was well-known during the Middle Ages. The historian *Thucydides* had vividly portrayed an epidemic during the second year of the *Peloponnesian War*. Between the plague during the reign of the *Emperor Justinian* (AD 543) and the Black Death (1348), there were a large number of plagues, involving such diseases as leprosy, bubonic plague, smallpox, diphtheria, measles, influenza, sweating sickness, and lesser diseases. The medieval urban dweller lived in constant fear of epidemics and when leprosy reached serious proportions in the 13th and 14th centuries, quarantine laws were rigidly enforced. At the beginning of the 13th century, in France alone there were about 2,000 leprosariums, and in all of Europe the number probably exceeded 19,000, although many sick persons were admitted who did not have leprosy. This was also the period when sanitation was awfully bad.

The third Roman Catholic *Lateran Council* (1179) made rules to govern the commitment of lepers. The experience with lepers was carried over when the Black Death (bubonic plague) killed thousands of workers in the 14th century. Persons, suspected of having the disease were required to report to local authorities who examined them; if the patients were found to have the plague, they were isolated, as were all those who came into contact with them; food and necessities were provided; the dead with their

personal effects were buried outside the city and the place where they had died was fumigated. Venice, the chief port for trade with the Orient, is credited with originating the pattern of quarantine procedure that was in effect during the Middle Ages, and other seaports also established observation posts and isolation hospitals. In England (12th to the 15th century) more than 720 hospitals were established, 217 of which were for lepers. At the beginning of the 14th century, Paris had about 40 hospitals and an equal number of leper houses. During the latter part of the Middle Ages, cities and guilds took an active part in founding and maintaining hospitals. Most of these diseases were caused by bad sanitation but it was not so realised.

By the close of the Middle Ages, medicine and public health had fallen under the local governmental control. Regulations protecting the water supply from pollution were supplemented by provisions dealing with street cleaning, garbage disposal, and the like, all of which collectively might be called *sanitary codes*. Physicians and surgeons were required to follow rigid codes and set fee schedules. In addition, writings on nutrition began to appear, and public bathhouses were licensed. The attempt to deal with public health problems on a municipal basis was far from successful. Inland cities were all but defenceless against diseases. In the larger cities, administration of particular ordinances was delegated to various boards, commissions, and officials - a situation that resulted in setting up a string of sanitary committees.

The Industrial Revolution occasioned a big increase in urban population, and slum conditions became acute in many manufacturing areas. The first English attempt at slum clearance was made in London in the 1760s, when many timbered buildings were pulled down and replaced by brick structures. Streets were paved, drained and lighted. In addition to diseases and slum conditions, the urban population faced poverty and unemployment. The Elizabethan *Poor Laws* imposed on the individual parish the duty to provide relief, including medical relief for the poor. By the beginning of the 19th century in England and on the Continent, the relationship between poverty, disease, physical environment, and crime had become apparent and the view that such conditions were neither inevitable nor irremediable was gaining ground. To the Rationalists of the Age of Reason, a scientific approach to social problems would provide the answers. Industrialists, such as Sir Robert Peel and Robert Owen, and physicians such as Sir John Simon and Thomas Southwood Smith, joined the social-

reform movement under the leadership of Jeremy Bentham and Edwin Chadwick. Royal commissions investigated and reported, studies were made, statistics were compiled and in the beginning of 1830s, social legislation was enacted.

A reformer, Edwin Chadwick, who was convinced that people *were poor because they were sick*, was a prominent figure in both the commissions that reported on the *Poor Laws* in 1834 and on public health in 1844 and 1845. As a secretary of the poor-law commission, he wrote the famous report: *An Inquiry Into the Sanitary Conditions of the Labouring Population of the Great Britain*, which was published in 1842. These reports eventually were embodied in legislation and established national supervision of health, safety, sanitation and social problems. The *Factory Act of 1833* was the immediate forerunner of modern industrial legislation, and the *Liverpool Sanitary Act of 1846* provided for health officers and borough engineers for that city. The *Nuisances Removal and Diseases Prevention Act* and the *Baths and Washhouses Act*, passed in the same year, were preludes to the *Public Health Act of 1848*. The first general housing acts were passed under the sponsorship of Lord Shaftesbury in 1851.

Since almost all mega cities grew along watercourses, the disposal of city waste (including human excreta) was not much of a problem. Most of these ancient cities had underground drainage systems to carry filth into water areas. Since cities were largely built on raised ground, the flow of waste into pipe was automatic. The history of sanitation is at least 5,000 years old. At *Mohanjo-Daro* in the Indus River Valley (now in Pakistan), archaeologists have uncovered a public bath (nearly 1,000 sq m) in area, dating from about 3,000 BC. Even the private houses had their own bathrooms, fitted with terracotta pipes encased in brickwork. Sewerage system, drains and water supply were well developed among the ancient Cretans, Egyptians and Incas. The ancient Greeks were first to recognise sanitation as an aid to healthy living and they organised public health services accordingly.

Roman did not follow any particular rules of city planning. The terrain of Seven Hills on which Rome was built was not an easy site to develop in systematic way. Moreover, there was little control in accommodating an ever increasing population. Two basic needs had to be met: a growing number of inhabitants had to be housed and adequate public services such as water and sanitation had to be provided. The Romans solved their civil engineering

problems with typical panache. One of their most important inventions was a superior concrete made from pozzolana, a sandy mineral mixed with lime. Most of their buildings, however, were of brick. In their grand buildings, these materials were faced with stone. The concrete dome of the Pantheon, built in the first century AD is 45 m (almost 150 ft) in diameter - unequalled until the building of St Peter's in the same city 15 centuries later.

ROMAN TOILETS AND BATH

There were two principal types of housing: the domus a group of rooms around a court yard and the insula, an apartment block. Surveys made in the 4th century AD show, that there were almost 1,800 domus-type houses and some 46,600 insulae scattered about in almost every part of the city, well-to-do families living next to poor people in cramped apartments. The nobility also had luxurious villas outside the walls. The swampy ground in the Tiber valley was drained, streams were covered over and channels dug. The first main sewer, the *Cloaca Maxima*, was constructed as early as 578 BC and was vaulted over in 184 BC. The Cloaca Maxima was Rome's first major sewer, built 2,500 years ago. Parts of it are still in use.

The Tiber supplied water until the volume of sewage discharged in the river made it undrinkable. A vast system of elevated aqueducts was built to bring clean water into the city from the surrounding hills. These had to be made extremely tall to serve the highest parts of the hilly city. A total of 505 km (316 miles) was eventually built, carrying 900,000 eu m (200 million gallon) of water daily. During the 2nd century AD the population of Rome reached 1.2 million. Records show that by the 3rd century there were 247 reservoirs, with 11 major thermae (large public baths and toilets), more than 900 other public baths and toilets and over 1,200 public fountains. Permission to build a new private bath and toilets was restricted to those who could arrange an adequate water supply. Water from the aqueducts was metered through narrow nozzles with an official seal to prevent tampering.

With the construction of Cloaca Maxima, completed under the Etruscan dynasty of the Tarquins, the last kings of Rome, the swampy valley which lay between the Campidoglio, the Palatine and the slopes of the Esquiline Hill was drained and reclaimed and became the meeting place of the inhabitants who lived on the

surrounding hills. From that moment, the small valley became the *square* (the *forum*), the political, religious and commercial fulcrum of Rome: the Forum Romanum.

Processions, trials, triumphal ceremonies, political meetings and elections took place here, and in fact it was the nerve centre of Republican Rome. But it was given its monumental appearance, for the most part, by Caesar, Augustus and Tiberius. It is difficult for someone, looking at the ruins for the first time today, to realise its importance: nevertheless, in this square, among what are now the ruins of basilicas and temples, honorary columns and triumphal arches, men with names like Silla, Cato, Cicero, Caesar, Augustus, Tiberius and many others discussed and decided the destiny of Rome. In this square, the great adventure of the Romans, the adventure of our own civilisation, had its beginnings.

An old Roman proverb defining an ignorant man said: "He doesn't know how to read or to swim." One of the highest expressions of the might and civilisation of Rome lay in the construction of its numerous baths. From their earliest times, the Romans had private baths in their houses and villas, and at Rome there was a public swimming pool, which gave its name to the 12th District and where the Romans learned to swim.

Leaving aside the minor baths, such as the Decian and Suran baths and those of Maecenas, the Imperial baths in chronological order were those of Marcus Visanius Agrippa, Nero, Titus, Domitian and Trajan. The Baths of Trajan marked a new point in the development of the design of thermal baths because of their disposition with a central complex of buildings and an enclosure around the perimeter, and the addition of gardens and "*exedrae*" (open meeting-places), so that they became the model for all the others which followed. These included the baths of Commodus (185 A.D.) of Caracalla (217 A.D.), of Diocletian – the largest (303 A.D.) – and finally those of Constantine (326 A.D.)

In the beginning of the 4th century A.D. there were 11 public baths, 926 private baths and about 2000 fountains. The huge quantity of water necessary to supply them was furnished by no less than 14 aqueducts. To form an idea of what the baths were like, the baths of which such imposing ruins remains today, we must examine the Baths of Caracalla which give us an almost complete overall view at least of the central body of this important structure. The public places were embellished with magnificent temples and public buildings. In AD 64, a fire destroyed large

parts of Rome which allowed Emperor Nero to redevelop the city centre in a more spacious and elegant style. Over the centuries the city walls were rebuilt seven times. Romans today are remembered not only for their empire but also for their sanitation facilities, parts of which are still in use while the Roman empire is lost to history.

Although Parisians set up a sewerage system by the 1400s, still only one Paris house in 20 was linked to it until the late 1800s. One of the great problems exercising the minds of the authorities, who governed the medieval towns, was their impregnability. These towns were virtually walled fortresses, making it difficult for unwanted people and material to get in. The town planners of the day made it equally difficult for things – including effluents of all kinds – to get out. Townsfolk and animals shared the land enclosed by the walls and towers and littered the unpaved roads with filth and garbage. The cleanest places in those crowded centres were monasteries and markets. The monks built their settlements to well thought-out plans with efficient latrines, ventilation and water supplies.

The essential convenience of modern living, *water closet* (WC), was invented in 1460 by an Elizabethan courtier, *Sir John Harrington*. Banished from court for a while by the outraged monarch for translating and circulating among the ladies a racy vulgar story by the Italian poet Ariosto, Harrington retired to his home near *Bath*. There he worked on a design for a flush WC and installed the contrivance in his own home. Having won his way back into Elizabeth's court, Harrington fitted a royal flush WC into the queen's palace at Richmond, Surrey. Unfortunately, he wrote a book about his device, *Metamorphosis of Ajax* (the title is a pun on the privy). The book appeared in 1596, and its unworthy humour led the incensed Queen Elizabeth to banish Harrington from her court again.

However, an improved model of Harrington's WC, incorporating a stink trap, was patented by a London watchmaker, *Alexander Cumming*, in 1775. Further improvements were made by a London cabinet maker and inventor, *Joseph Bramah*, in 1778. These early WCs were connected straight to cesspits and, even after the invention of stink traps, the smell from them must have been pretty powerful. With the invention of the modern sewer system in Hamburg in the 1840s, (with arrangements for flushing the pipes with river water) the general health of people

and sanitation improved. The finest of the 19th century sanitation engineers was *Sir Joseph Bazalgette* who, in the 1850s, equipped London with an efficient system of sewers for which he invented automatic flood doors and new pipe sections that allowed a speedier flow of effluents. The chamber pot was a clear improvement. In Victorian times, it became a veritable *object of art*. In 1929, an American electrician, *Elbert Stall-worth*, patented the first electric chamber pot for use on chilly nights. In a rubber and asbestos seat, which ran round the upper edge, were embedded metal bands enclosing resistance wires between the mica strips. In spite of good work done in the field of urban sanitation in advanced countries, the diffusion of these facilities did not cross their boundaries. In poor countries, the system of excreta disposal remained primitive and unhygienic as ever before.

EARLY LEGISLATION

In Europe there were not many examples of social health and sanitation legislation before the 19th century. In order to check the high rate of infant mortality, the British Parliament passed a series of acts which, in an act of 1751, gave control of licensing to magistrates; and perhaps the first example of social insurance was an act of 1757, "for the relief of coal-heavers working upon the river Thames," that required the employer to deduct sums from employees' wages for a fund from which benefits would be paid in case of sickness, invalidity, old age or death. Because of its abuse by employers, however, this early insurance plan was abolished in 1770; only to be revived in 1792, when a similar act was passed providing for trustees to manage the fund. *The Health and Morals of Apprentices Act*, sponsored by Sir Robert Peel, was enacted in 1802 to improve the conditions of child labour in the cotton mills. Although this legislation was largely ineffective, it did establish the government's interest in industrial conditions and led to agitation for child-labour laws in other industries and countries.

Movements similar to that which brought about the rise of social legislation in England gained momentum in Germany and France. Johann Peter Frank, German pioneer in public health, ambitiously undertook to systematise all existing knowledge on the subject and to devise detailed code of hygiene for enactment. Frank, because of his broad scholarship, was one of the first to urge international regulation of health problems and creation of

a national health authority to coordinate matters within the country. However, no such act was passed in the developing countries where industrialisation came a century later than in Europe. But when it did, the Third World cities were swamped with people, fleeing villages. This migration to cities far exceeded in number than the one which was witnessed in the 19th century Europe when a series of bills were passed to manage city life. Migration almost totally destroyed sanitation services. The city sewage system could not face pressure nor was there enough water in rivers, on which the sewerage system was based, to carry away effluents. The growing slums and the consequent diseases caused, among others, by open defecation had made the situation alarming.

This alarming situation produced the Sulabh Sanitation Movement just as insanitation of the industrial Europe unleashed a series of initiative, including the Chadwick movement, to clean up places. However, the industrialising Europe of the last century, and the almost the similar situation in India now, are different in more ways than one. For instance, never in Europe the population pressure on resources, including land and water, was so intense as it is in India now. So the sewerage system suited ideally to the West. In India, however, it does not. There is neither enough water to carry effluent nor enough urban land for open defecation except along rail tracks or in public parks. Hence, the birth of the Sulabh on-site human waste disposal technology, which, apart from other advantages, will also leave water and land clean and usable. In this context the Sulabh sanitation technology of on-site human excreta disposal system should be studied. And, for this reason, the Sulabh Sanitation Movement becomes a global movement to address civic problems of health and hygiene, the environment and sanitation. But, however dramatic the events, everyday life goes on - sometimes troubled, sometimes quiet - because we are not the *last man of history*, *a la* Francis Fukuyama.

With these facts and assumptions, begin the story of the Sulabh Sanitation Movement as yet another link in the unfolding of human drama - very interesting and very futuristic at that. ●

When human minds are stirred by new ideas, society cannot remain the same.

- Raja Rammohan Roy

Origin and Growth

Some ages are defined by war and conflict; other by industrial growth and yet another by baby boom. And, some ages are, however, defined by their epidemics. In 1347, rats and fleas, stirred up by Tartar traders cutting caravan routes through Central Asia, brought bubonic plague to Sicily. In the space of two years, Black Death, which spread from China, killed up to 30 million people in Europe in the 14th century. It is estimated that between one-third and one-half of British population was affected by it in 1340-48. In 1520 Cortes army carried smallpox in Mexico wiping out half the native population. In 1918, a virulent strain of flu swept through troops in trenches of France. By the time it was over, 21 million men and women had died - more than those killed in the World War I.

The post-Independence India had many achievements to its credit but many social asymmetries, distortions and injustices still persist that have undermined our claim to be a civilized society. Fifty years down the road Indians' poverty and human deprivation is hard to accept. We have around 10 per cent of our people living twice as many poor people today as there were in 1947, twice as many illiterate, hungry and marginalised people barely existing and excluded from the mainstream of economy. Our children get less protein and fewer calories than their grandparents did at the same age. India has 135 million people who have no access to basic health facilities, 226 million who have no access to safe drinking water; over 100 billion who lack basic sanitation facilities. India also has the distinction of having the largest illiterate population in the world (UNDP Report).

Fifty years of promises, fifty years of borrowed ideas, fifty years of growth hijacked by powerful groups, fifty years of widening disparities, fifty years of increasing inequalities. All these have led to social and political unrest, increased crime and corruption and the disintegration of the social fabric. The skewed growth has caused disparity in society.

One such social disparity is the continuance of the system of manually cleaning and carrying human excreta. And, those who do

it – *scavengers* – are the poorest among the poor and untouchables among the untouchables. They are hated even by those whose excreta they clean and carry physically. Scavengers live far away from village areas in huts along with pigs and other animals – starving, boycotted, disadvantaged and disenfranchised. Against social injustices, much less hurting than this, many revolutions were caused. If it did not happen in India, it was because of the *Sulabh Sanitation Movement* which is a major attempt at social reform – more important than any launched after Rammohan Roy.

It was not as momentous as the fall of the apple in Newton's courtyard, nor as fortuitous as the sight of a dead man that turned Prince Gautam into Buddha who enlightened the world. It was an ordinary case of a jobless wandering educated youth in search of a job in Patna. The rural upbringing combined with the piety of a Brahmin family produced a passion for ideals which refused to die even in the worst days of joblessness.

It was quite about the time (1969) when Dr. Bindeshwar Pathak got a job in the Gandhi Centenary Celebrations Committee as Pracharak (extension work in-charge) which involved extensive tour of Bihar villages. Besides deep studies in Gandhian idealism of compassion and humanism, the job also exposed him to the problems of the



A scavenger basti in Bihar where Dr. Pathak did extensive research and study of their problems

people, specially the poor, who were target groups to serve. However, people did not show much enthusiasm towards Gandhian ideals which, it seemed, were reduced to rituals, specially in the birth centenary years of the Father of the Nation. Very clearly, people wanted pragmatic programmes to solve their problems and pressure continued to mount following the collapse of the old feudal order without yielding its place to a new one.

Soon after, he was transferred to the Balmiki Mukti Cell of the Gandhi Centenary Celebrations Committee. And, it was here

that a storm started brewing in his mind on seeing the pathetic conditions of scavengers who carried human excreta on the head, generation after generation, without protest and with total resignation. The horror of their lives, sufferings and their untold miseries continued to haunt him during the Gandhi Centenary period (1969-1970) when Dr. Pathak was exposed to the depth of human degradation, the



**IF YOU HAVE TEARS, SHED THEM NOW:
Fifty years of freedom and the inhuman
practice of physically cleaning human excreta
still continues. And, that too without
national repentance and remorse**

like of which never happened to him when he had no money to buy food. Many questions arose in his mind. Has the system failed? Is our religion as bad as to reduce a large section of people to this state of living? How is Gandhism relevant to them today? These and many other questions pained him by far more than his personal problems which were also many.

Dr. Pathak had seen scavengers sulk between half-dark lanes to collect excreta. The anguish on their faces, the fear and fright brought to his mind the images of Nazi death camps. But, it was an occasional sight which left no mark on his mind until he joined the Balmiki-Mukti Cell in Patna where it was his regular job to be constantly in touch with scavengers and try to mitigate their sufferings.

During this period, the Bihar Government directed all its local bodies to get the manually-cleaned bucket latrines converted into hand-flush latrines and connect them either to sewer-lines or leach pits by way of tribute to Mahatma Gandhi who sought to abolish scavenging, but failed. To encourage people to do it, the State Government sanctioned loans and grants. The work of propagation, demonstration, training engineers, junior engineers, sanitary inspectors, masons, etc. was entrusted to the Bihar State Gandhi Centenary Committee which was a very important body presided over by the then Governor. The then Chief Minister was the Chairman of its Executive Committee.

The Committee continued the toilet conversion programme with the grants it received from the State Government. But there was no visible impact on the situation. In that situation, Dr. Pathak suggested to the Mukti Cell to undertake the toilets conversion programme itself, but he was opposed and was told that the cell was set up to propagate the Gandhian ideals and not to act it out. He saw contradictions in the argument and resigned from the cell. This was the parting of the ways with the official machinery.

As an outcome of the commitment to give practical shape to the ideas of Gandhi, the Sulabh Sanitation Movement was launched in March 1970 in Patna, Bihar, India, by the action sociologist, Dr. Bindeshwar Pathak, who combined in himself the traits of an engineer, academician, planner and social activist – all blended into a happy harmony to produce a multi-faceted dynamic personality daring to become a leading social reformer of our time. To begin with, the first meeting was held in a hut and was attended by only seven persons, *the pioneers*, who laid out the broad outline of policies, and philosophy of the mission. However, they could never foresee that the small one-time effort at social service will become a pan-India movement, now set to cross the national boundaries.

Nobody could know, not even the Pilgrim Fathers, as it were, that a trickle will become a torrent to engulf the sedate



FOR WHOM THE BELL TOLLS: Scavenger couple
Chunilal and Kamalia.

and traditional Indian society, and that the Sulabh Sanitation Movement will become a phenomenon with close to 35,000 social volunteers working round-the-clock to promote its objectives. Who knows what the future holds for

us. Gandhiji only wanted a seat in an all-White railway compartment in South Africa and he was thrown out of compartment at the Pietermaritzburg railway station (now named after Gandhi). And, the British lost the Indian empire. Napoleon just asked 24 francs from his girlfriend, Disrae, to buy uniforms and with that he went to Paris from Corsica and captured the entire Europe. Lincoln's life's dream was to travel from his log cabin in Kentucky to walk along river Potomac in Washington where he finally lived and died as President of the United States. Newton was a shy indoor man, but when he decided to sit out in his apple orchard, the world was never the same again. These events are governed by the *Laws of Unintended Consequences*.

The Sulabh pan-India sanitation movement had a small beginning when it started as a trickle in Arrah district of Bihar to become a mighty movement, enclosing within its fold the entire area between Kashmir and Kanyakumari. Falling over the brims, it has also

crossed national boundaries to go over to the South-East Asia, Africa, and Latin America where Sulabh methodology and technology have been recommended for adoption by U.N. agencies, including UNDP, UNICEF, WHO and World



A view of world's biggest public toilet complex constructed by Sulabh near Mumbai

Bank to be finally declared as the *Best Global Practice* at Habitat-II conference at Istanbul, June, 1996, in recognition of which the Sulabh International Social Service Organisation was given *Special Consultative Status* with the Economic and Social Council of the United Nations. The Sulabh International Social Service Organisation is a self-sustaining attempt to render social service without having to depend on grants and loans. It does not get any aid or assistance from any national or international agency because

it asks for none. It generates its own resources to meet its commitments and promote the ideals of the movement by setting up its own delivery system and working out its own methods.

The Sulabh Sanitation Movement, of which the Sulabh International Social Service Organisation is the executive wing, was launched to restore human rights and dignity to half a million scavengers and abolish the cruel practice of manually cleaning and carrying human excreta. No human rights violation is greater than this.

During Gandhiji's lifetime, and even after that, many attempts were made by different organisations to solve the problems of scavenging and environmental cleanliness but no tangible results were achieved. Dr. Pathak conceived the idea of relieving scavengers from the centuries-old inhuman cruel practice of carrying human waste as headload in 1968 while he was working for the Bihar State Gandhi Centenary Celebration Committee, constituted to celebrate the birth centenary of the Father of the Nation Mahatma Gandhi. Dr. Pathak was entrusted with the task of studying the problem of the poor, specially scavengers. Dr. Pathak travelled all over the country and lived in the colonies of scavengers where he realised the magnitude of their problems and he was so deeply moved by their miseries that he made restoration of human rights and dignity the sole mission of his life.

The Sulabh Sanitation Movement aims at restoring human rights and dignity to scavengers, their social integration, and poverty alleviation on one hand and prevention of environmental pollution and promotion of ecology, health and hygiene, on the other. During these years, Sulabh succeeded in liberating more than 35,000 scavengers from the demeaning practice of physical cleaning and carrying human waste, rehabilitating them in other professions, setting up about one million scavenging-free pour-flush toilets with bathing facilities, now being used by over 10 million people daily, working all over the country, employing 50,000 strong dynamic force of engineers, scientists, social scientists and sanitation experts to become the largest social service organisation in India and abroad. In fact, there is a rapid deterioration of ecological balance all over the world. Population explosion, urbanisation and industrialisation of towns and villages, destruction of forests, soil erosion and an ever-increasing number of motor vehicles are the main causes of this imbalance. Moreover, in Third World countries, like India, another major cause of environmental pollution is the absence of a hygienic and safe

human waste disposal system.

Out of 5.5 billion people living on the planet earth, about 3 billion are not having access to safe and hygienic sanitation facilities. In India alone, out of 950 million people more than 700 million are either



Late Bharat Ratna Mr. J.R.D. Tata in a Sulabh toilet, Mumbai

using dry latrines, manually cleaned by scavengers, or they use the surrounding environment for open-air defecation. Due to non-availability of toilets, specially in rural areas, women cannot defecate in privacy with dignity. They go for open defecation either before sunrise or after sunset, which is not always safe for them. In India, nearly half a million children die each year of the diseases like dysentery, hookworm or cholera and of all the diseases diarrhoea claims the highest number of lives in the country. This staggering mortality rate arises due to lack of safe human waste disposal system. Therefore, sanitary engineers, social scientists, planners and administrators all over the world were feverishly searching for an affordable, safe, scavenging-free and hygienic system of human waste disposal which could be adopted on a mass scale.

In India, out of about 4,800 towns only 300 are sewer-based and that too partially. The cost of construction and maintenance of sewerage is prohibitive in a densely populated country like India. In addition, the septic tanks have found favour with only 20 per cent of the urban population. The vent pipes constitute a danger of foul odour and air pollution. Moreover, cleaning the tanks periodically renders the need of scavengers imperative.

THE ADVANTAGES

On the basis of available material and research done in India and abroad, Dr. Pathak modified and developed a low-cost sanitation

technology of two-pit pourflush toilet and named it as Sulabh Shauchalaya. It requires no manual handling of human waste. It is a pourflush watersealed latrine with two leach pits. It has a specially designed pan with a steep slope, a trap and a water seal. The space of about two sq. metres would suffice for its construction. The water-seal prevents foul gases from leaking out of the pit. This economy toilet requires only two litres of water for flushing instead of 10-15 ltrs needed in the conventional system. Thus, the enormous quantity of water, which is a scarce commodity, is



The human excreta-based biogas is also used for cooking

saved. The biggest advantage of the Sulabh toilet system is the fact that it does not require services of scavengers and it also saves the environment from pollution. It is the safest low-cost on-site human waste disposal system. The Sulabh technology has been found to be a viable alternative to sewerage and septic tank systems. This

technology has been

recommended by the UNDP, World Bank, UNICEF, WHO, HABITAT and other agencies for adoption in South-East Asia, Africa and Latin America. Queries are received from all over the world on the technical know-how involved.

Moreover, this technology has served two major purposes in India. Firstly, it has found ways to stop the open-air defecation, which is a common practice in India, and secondly it has been able to pave the way for ending the sub-human and unhygienic practice of manual handling of human waste which is also a great human rights question. The technique of construction of Sulabh low-cost sanitation toilets is simple enough and even an ordinary mason can construct it easily. The pans and traps may be of ceramic, fibre glass, PVC, HDPE, cement or mosaic. Various models of Sulabh toilets have been designed to suit users of different economic level both for rural and urban areas. The leach pits can be rectangular, circular or square in shape depending upon the space availability. The cost

of these toilets ranges between Rs. 600 (or US \$ 20) to Rs. 5000 (or US \$ 170). Nearly one million dry latrines have been converted into Sulabh toilets the Sulabh.

ZERO SUBSIDY SANITATION REGIME

In 1974, Dr. Pathak introduced the system of operating and maintaining "*Pay-and-Use*" community toilets with bathing, washing and urinal facilities with round the clock attendant's service and availability of water and electricity. Soap powder is supplied to users for washing hands. Users have to pay a nominal charge; the children, disabled persons and those who cannot afford to pay are not charged. Use of urinal is free. It is an unique example of community participation and zero subsidy. These toilet complexes are used by a large floating population. Slum and pavement dwellers, rickshaw pullers, physically handicapped, the weaker sections of society, commuters and the tourists are benefited by these facilities. Medical services of qualified doctors are also provided at some complexes. The Sulabh toilet complexes have, therefore, been accepted by the people and the authorities for their cleanliness and good management.

After establishing neat and clean toilet complexes and liberating scavengers, Sulabh has set up a number of vocational training institutes throughout the country where liberated scavengers, their sons and daughters and the other weaker sections of society are given training in various vocations like computer technology, typing and shorthand, electrical trade, woodcraft, leathercraft, diesel and petrol engineering, cutting and tailoring, cane furniture making, masonry work, motor driving, etc. The purpose of providing them this training is to give them new means of livelihood, alleviate poverty and bring them into the mainstream of society.

Sulabh has set up an English-medium School in Delhi for children of the poor. Half the number of children are from scavenger families and the rest from others. This homogeneous composition ensures that there is no discrimination. Free education is imparted to the underprivileged children. They are provided free textbooks, school uniforms, mid-day meals and bus services. The children are also provided with excellent playground facilities inside the school premises for their overall growth. The schooling is vocation based from IV standard onwards, with training facilities in

typewriting, computer handling and office management, so that employment may not become a problem later.

ATTITUDINAL CHANGE

Dr. Pathak is continuing his relentless crusade for liberating and rehabilitating scavengers and other weaker sections of society, but the stigma of untouchability remains deep-rooted. A programme for removal of this social curse has been initiated. In 1988, Dr. Pathak, the Founder of Sulabh Sanitation Movement, led 100 scavengers alongwith Vedic Brahmins to the famous Nathdwara temple in Rajasthan. In the temple, everybody performed *puja* and took '*prasad*' and meals together. Similarly, on the birth anniversary of great social reformer, Dr. B.R. Ambedkar, a seminar and community lunch was organised in the premises of Sulabh International Social Service Organisation, Delhi, where people of all castes and creeds exchanged views and took meals together. On October 2, 1990 Sulabh organised a massive rally starting from a scavengers colony in New Delhi, and alongwith scavengers and others. Everybody took a vow at the national memorial of Mahatma Gandhi to abolish scavenging by the turn of the century.

In 1993, Sulabh embarked on a noble programme of social upgradation and integration of four hundred thousand scavenger families. Under this programme, Dr. Pathak made an open appeal to the elite of society to have social interaction with at least one such family to enable them to lead a dignified life as equals in the society. So far 5,000 scavenger families have been socially upgraded and brought in the mainstream of the society. Similar programmes are envisaged in a phased manner throughout the country for the removal of untouchability and restoration of human rights and dignity to those who have been deprived of these for generations.

The Sulabh International Social Service Organisation has developed use of biogas produced by recycling the human waste at community toilet complexes. It is an unique experiment in the use of low-cost non-conventional sources of energy. The bio-gas thus produced is utilized for different purposes such as cooking, lighting mantle lamps, heating water, warming bodies in the cold climate and generating electricity. This organisation has also developed bio-fertilizer from human waste. Through a simple process; it is converted into odourless granules which can be used to enhance the productivity of the soil. Sulabh volunteers go to different rural and urban areas and

try to inculcate a sense of sanitary awareness among the masses, popularising the use of non-conventional sources of energy like smokeless stoves, biogas plants, solar energy, etc. This relieves villagers and housewives of the trouble of bringing firewood for cooking purposes, smoke in the kitchen and also helps to curb deforestation, thereby preserving the natural resources and the environment. School children are periodically taken round Sulabh complexes along with teachers to create sanitation awareness.

A NEW APPROACH TO GROWTH

Sulabh has developed an innovative approach for integrated rural development and poverty alleviation. It has initiated a massive programme to train two rural youths from each rural local body to function as change agents. These agents are trained in multi-disciplinary developmental activities, such as construction of Sulabh toilets, repair and maintenance of hand pumps, construction of smokeless stoves, primary health care services, social forestry, etc. so that they may earn their living by remaining in villages. These trained persons work as catalytic agents to serve as a link between the government and the community. This programme has generated employment for rural youths. So far nearly 35,000 youths have been trained in water supply, sanitation and other allied works and provided employment. Thus, about two hundred thousand persons have been elevated above the poverty-line. The uniqueness of Sulabh lies in the fact that a sense of discipline, duty and dedication to work and respect towards all the human beings is inculcated in all its workers by way of compulsory morning prayers in all the branches of the organisation throughout the country. After the prayer meetings, the workers are encouraged to implement the various developmental programmes to the best of their abilities.

For the benefit of the masses, Sulabh International Social Service Organisation has published literature on the Sulabh Sanitation Movement in all the 15 major languages of the country. Dr. Pathak has himself written a number of books prominent among them are:

- *Road to Freedom;*
- *A Study of Directed Change;*
- *A Simple Idea that Worked; and*
- *Eradication of Scavenging and Environmental Sanitation in India.*

Dr. Pathak also gives personal attention to the problems of the masses. He periodically holds meetings with senior workers of his organisation, involving discussions on various policies for the upliftment of the poor and downtrodden. He takes keen interest in developmental activities and visits various sites to monitor personally the implementation of different schemes under the Sulabh Sanitation Movement.

Sulabh International has laid special emphasis on technical research and development. Techno-economic issues relating to low-cost sanitation and biotechnology are studied to make them more cost effective and efficient. Pollution aspects of on-site sanitation system and the preventive measures are also studied. Investigations are going on for optimum utilisation to recycle the other wastes such as aquatic and terrestrial weeds, agricultural wastes, certain organic industrial wastes, etc. for producing bio-energy. Many R&D projects have been taken up in collaboration with various national, and international agencies. Sulabh has also a tie-up with the British Council to train teachers on environmental and sanitation programmes. And the teachers will finally transfer this knowledge to students to ensure sanitation and environmental protection. The good work of Sulabh has have drawn worldwide attention. Bharat Ratna late Mr. J.R.D. Tata was so impressed with the activities of this organisation that he not only himself sponsored a new Sulabh toilet complex in Mumbai, but proudly inaugurated the same.

Sulabh activities are permanently recorded in various citations and media reports, both at home and abroad. Many eminent persons from all over the world have visited its various activity centres and recorded their appreciation. Dr. Pathak has been invited by different countries to seek his guidance on low-cost sanitation. What started as a small voluntary group of five persons has snowballed into a mighty movement with more than 35,000 persons working round the clock all over India to promote human rights, environmental sanitation, personal and community hygiene, healthcare and to establish a new social order by alleviating poverty and abolishing glaring inequality. And, in so doing the Sulabh Sanitation Movement is well set to build a society based on equality and fraternity. ●

Ideas move the mountain.

- Newton

Concept and Comparison

Revolutions are like boulders hurled into ponds. Ripples radiate for centuries. They are the events that change things dramatically while movement is a process that brings about changes in people's life over a long period. For instance, the French Revolution was an event and industrialisation was a process. The unintended consequence of the French Revolution was Napoleon whose most important result (as France learned in 1871, 1914 and again in 1940) was the "invention" of Germany which destroyed Napoleon's France twice in less than 20 years. Napoleon's was the Revolution on horseback. He could never know where the *"limits of the possible"* ended and the *"limits of the impossible"* began. This he learnt at great price after the defeat at Waterloo and through the corpses and orphans left after retreat from Moscow. But, Napoleon's sense of "limitless possibilities" unleashed great energy in science, art and literature. Freud, Edison, Marconi, Pasteur, Ford and many others later are the products of "limitless concept" of Napoleon who himself became its victim, to be captured and exiled to St. Helena where he died (1821) as a prisoner of his own dreams.

For that matter, history's great turning points are seen throughout its course as fitting into a framework of continuous change, some of which can be appreciated long after they have taken place when we suddenly discover that we have lost the old world. Movement is not a sudden flight into limitless skies or a quick dash to the target. It is like a marathon where you have to put in place a process of continuous improvement to finally consummate into a giant step. Or, a series of giant steps. Sulabh is a movement in this respect and not an event.

To be true, Bihar has been a land of great movements. It has been a land of great leaders, emperors, social reformers, saints and seers. Lord Mahavira, Chandragupta Maurya, Samrat Ashoka, Guru Govind Singh, Dr. Rajendra Prasad, and Arya Bhatt were born in Bihar. Lord Gautam Buddha attained *Nirvana* in Bihar, which has also been the place where many religious, social and agrarian

movements started. Mahatma Gandhi launched the first civil disobedience movement from Champaran (Bihar). Earlier in Middle Ages, and in the last century, there had been other movements in the country, including Jainism, Brahma Samaj and Arya Samaj. All these were protest movements launched to change the social order. The Sulabh Sanitation Movement is also a protest movement, working to make people think differently. The place of the genesis of the Sulabh Sanitation Movement has its atmospheric advantage, much of which is reflected in the purity of its thought and philosophy, so also in a well-defined features of the social change that it seeks to bring about.

In this century, many social movements were launched and many more died stillborn. In 1951-52, for instance, there was a battle-cry; *tiller of the land is the owner of the land*. And that upset the age-old concept of rights over land. The impact of this change on society was heard all over the country, the loudest in the Telengana region of Andhra Pradesh where the dispossessed peasants rose in revolt. The army was called in to control the situation. The forcible seizure of land and property became the source of violence. The Naxalite movement, and its many political wings, were the manifestations. But, the problem was not solved; not even law could do that. Hence, Vinoba Bhave, a disciple of Gandhiji, said that if the law could not solve the problems nor violence, people's participation was the only way out. And, he launched the Bhoodan Movement.

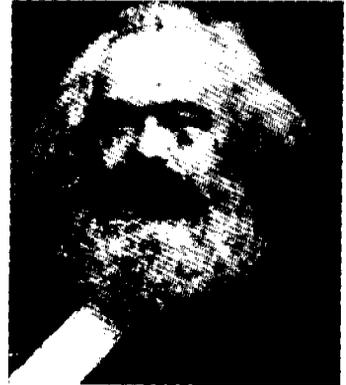


Swami Vivekanand
Pioneer of Indian
Renaissance

The Bhoodan Movement was itself a product of the Gandhi's *Sarvodaya* (uplift of all) movement launched in the early thirties. Within *Sarvodaya*, was yet another movement, *Antodaya*, uplift of the poorest among the poor. Quite at a time when the Bhoodan Movement was in full swing, there was yet another revolt, called Berkeley Movement. (Berkeley is one of the seven campuses of California University in the US) where students rose in revolt, not demanding job or food; they had both. They wanted a share in power. This movement spread all over Europe, resulting in a change in power structure and revision of age-limit on voting.

Most social movements in India in earlier

times were focussed on one issue: Brahmo Samaj (sati), Arya Samaj (religious reform), Ramkrishna and Vivekanand (spiritual revival), Tilak (*swaraj*), Lajpat Rai (*swadeshi*), Arbindo (Indian nationalism), Tagore (Indian culture and swadeshi-internationalism), Abu Taleb (western education), Azad (Indian nationalism), C.R. Das (non-cooperation), Jinnah (Pakistan), Iqbal (Modern Islam) and M.N. Roy stood for radical humanism. When Gandhiji came to India, he sought only to promote the original objectives of the Congress by working for social reforms for which the British civil servant Allan Octavian Hume set up this organisation



"The philosophers have only interpreted the world differently: the point is how to change it."

- Karl Marx

in 1885. But, later it developed into a political movement. In the midst of political turmoil and violence, Gandhiji stuck to the social contents of the Congress revolution and launched many reforms, including abolishing scavenging, but could not go very far. Gandhiji was assassinated within six months after Independence and his plans for social reforms were lost in political humdrums.

Every thought system is a response to a situation. In fact, every new idea is a product of its own time and place; it cannot be seen apart from the world it seeks to interpret. And, the world changes, so do ideas. Karl Marx reacted to the cruelty of the Industrial Age; John Maynard Keynes found a response to the Depression of the thirties; Nehru was the product of the liberal thought system and Gandhi represented the post-colonial age after the end of the World War-II in 1945. In the early forties, nobody could teach at Harvard without being a Kenysian and in the late sixties, no Kenysian was allowed to enter Harvard. Aristotle and Chanakya were contemporaries; while Aristotle talked about the economics of politics in European context, Chanakya talked about ethics of economics in his *Arthsastra* in Indian context. Both the ideas were response to differing situations. The Sulabh Sanitation Movement cannot be an exception.

Dr. Bindeshwar Pathak explains the Sulabh concept in sociological terms. He says in the beginning there was chaos in the world; everybody was killing everybody. The strongest among

them survived. This was also the time when people roamed about in groups, united as they were by the common desire for sex, loot or sheer survival. People migrated to wherever they could get these. However, these people were not savage. One of the *Vedas*, *Yajurveda*, was written by the Aryans somewhere in Mesopotamia (Iraq) and Afghanistan where people today are killing each other to seize power. The *Vedas*, Dr. Pathak says, are not the books of religion; they are records of profound human thoughts on mysteries of nature. One of the *Vedas* asks: Why the sun shines! Or, what is this world, - air, forests, and skies! To read them is like reading Stephen Hawking who also asked similar questions to become the greatest physicist of the world after Newton.

SULABH IS ALSO AN ANTYODAYA MOVEMENT WITH A DIFFERENCE

Acharya Vinoba Bhave was born in an obscure Maharashtra village in 1895 where, being a Brahmin, he was taught to live an ascetic and spiritual life. At the age of ten, he took the pledge of celibacy and remained unmarried all his life. After his education at Banaras Hindu University, he became the follower of Gandhiji and went to jail many times for *satyagraha*. He worked at his *ashram* with so much devotion - scavenging, spinning and cooking - that Gandhiji changed his name from *Vinayak* to *Vinoba* and chose him the first Satyagrahi in 1940. Which meant that he was the spiritual successor to the Father of the Nation.

Acharya Vinoba's approach to *antyyodaya* was based on *change of heart and mind*. He wanted princes to give away their jewellery and excess land to the poor. The violence against land-owners in Telengana and later in Naxalbari village of West Bengal in 1956, led to his formulation of *bhoodan* and *gramdan* programmes which he described as "*looting with love*". However, he was disappointed with his own programmes because he had got



"Sati is murder."
Raja Rammohan Roy

the largest area of land in Bihar and Orissa where violence was most extensive. "I accept defeat. I got lakhs of acres in *bhoodan* and hundreds of village in *gramdan* but I see disorder in Bihar and shooting in Orissa." The political development in 1974 led to serious difference between Vinoba and Jayaprakash Narayan, his disciple, who finally separated to set up the *Sarva Sewa Sangh* in July 1974 and the majority of Vinoba followers joined JP. And, thus ended the Vinoba movement without hail and farewell.

Acharya Vinoba was a saint and, hence, too good for this world. But that was certainly not enough to bring about *antyodaya* or *sarvodaya* which he sought to achieve by establishing a new spiritual order. And, failed. Vinobaji spoke of *sarvodaya* - a term used by Gandhiji in 1904 as the title of his Hindi translation of Ruskin's *Unto the Last* - as the highest form of socialism. He did not believe in the rise of the few or of the many or even in the greatest good of the greatest number; he believed in the good of one and all - high and low. "The rich have fallen and the poor have not risen either; hence, both need to be uplifted through *sarvodaya* plans." (When we read Vinoba's thoughts today and see people fighting for reservation, quota and special treatment, we begin to realise the distance we have travelled since the great Indian *rishi* starved himself to death in sheer remorse.)

Sulabh is also a *antyodaya* movement - upliftment of the poorest among poor but with a difference. Unlike Vinoba Bhave, Dr. Bindeshwar Pathak has identified the poorest among poor - scavengers - and sought to re-build their future through a well-developed scientific package of practices - liberation, education, rehabilitation and social rehabilitation - and a universally recognised technology which is a critical lever to the entire movement. He believes that once the poorest among poor is brought above the poverty-line, it will have the ripple effect and *antyodaya* will finally lead to *sarvodaya* (upliftment of all) and, thus, a new society will emerge. Vinoba's approach was moral and his influence on the minds and hearts of Indians became manifest when thousands and thousands of acres of land was given to him in *bhoodan* to be distributed among the landless. His movement lent a moral overtone in the best traditions of Indian *rishis* of ancient times which set in the national remorse over social inequity. Vinoba believed that poverty in India was a moral question and it should be solved by making an appeal to the conscience of the nation, asking people to give away their jewels and excess land.

Without denying the moral basis of society, Dr. Bindeshwar Pathak says that poverty in India is a structural problem; it is also a problem of technology, education (specially women's education), population control, protecting ecology, social and religion asymmetry like untouchability and caste system. The growth of a nation is the sum total of its cultural preferences, values, habits, historical experiences, education and economy. The attempt to end poverty should take into account these co-efficients. The spiritual approach alone will not end poverty without application of modern methods based on science. In view of that, he developed an all-inclusive package (*Sulabh Model of Development*) of principles and practices to create a prosperous society with the focus on *antyodaya*.

Gandhian ideals inspired the Sulabh Founder to work for abolishing scavenging which he sought to do when he was with the Gandhi Centenary Committee in Patna in 1968. Dr. Pathak adopted, adapted and innovated the Gandhian programmes to make them first class fighting instruments in the battle to end social evils, including untouchability. After Gandhism, Sulabh is the only movement in India which is all-inclusive, technology-based and modern, at once combining in itself the virtues of the past with a glorious vision of the future - basing itself on the central theme of *antyodaya*.

BRAHMO SAMAJ

Raja Rammohan Roy (1774-1883) launched *Brahmo Samaj* after he had seen the burning alive of the widow of his brother, Jagamohan, on April 12, 1812. The Brahmo Samaj advocated monotheistic religion based on *Upanishads* and educational and social reforms on the Western line. The turning point in Dr. Bindeshwar Pathak's life also came when he was forced to drink cow urine and dung for touching a scavenger. This incident deeply stirred the young mind and he was never the same again. He studied books, scriptures and discussed with Brahmins after he grew up to finally conclude, like Rammohon Roy, that untouchability had no religious sanction. Dr. Pathak wrote books, a series of articles, position papers and edited a magazine, *Sulabh India*, to demolish the concept of untouchability. Rammohan Roy also did that; he wrote many papers, important among them was *Brief Remarks Regarding Modern Encroachment on the Ancient Rights of Females According to Hindoo Law of Inheritance*



India, a crowded sub-continent

and edited a magazine, *Sambad Kundali*. Dr. Pathak, like Roy, pleads for the learning of English language to be able to have access to the vast reservoir of knowledge, including that of science and technology. Roy sought and got the help of the Government (*William Bentick*) in legislating and enforcing anti-*Sati* law. Dr. Pathak also persuaded the Government to make laws, abolishing scavenging and persuaded the Rajiv Gandhi Government to include it in the 20-Point Programme. Both the social reformers preferred education, social reforms and persuasion to legislation and coercion. Ironically, these two events happened almost a century apart but, amazingly, on identical lines because the sensitive minds of two leading social reformers were deeply stirred by the cruelty of the system - one working against widows and another against scavengers. Never since Raja Rammohan Roy has one man attempted and achieved so much for the poor and the disinherited as Dr. Bindeshwar Pathak.

Sulabh Founder says that civil society does not arise out of the logic of advanced industrialisation. On the contrary, the US, Germany, and Japan became leading industrial powers because they had healthy endowment of *social capital* and spontaneous growth of civil society. People, as a matter of fact, work harder when they know that they are creating a new social order rather

than earning more money for shareholders. This is the central belief of the Sulabh Movement. So was of Brahma Samaj. After agriculture was 'invented', human civilisations began shaping up along big rivers, like Tigris, Euphrates, Nile and Indus. These were highly developed civilisations which, as indicated by excavations, had many modern systems, like city planning and drainage. But since there was nothing like nation-states, norms, ethics and beliefs were developed to keep the flock together. First, it was religion, then came tribal fealty and the caste system. These and many other practices, which are major sources of social distortions today, once held societies together.

The caste system was also an economic arrangement; carpenter, blacksmith, warriors, and teachers provided basic services to make the unit (village) economically viable. The caste system also provided an iron-clad social framework which averted disintegration of the group at the time when the people were conquered and social structure came under great pressure. Education, art, music theatre, agricultural skill, medicine, etc. - all these and more also developed outside institutions which have become the rolling mills to produce the so-called experts today. Father trained the son to become dancer, actor, musician, teacher, killer and king. There were hardly institutions like school, training centres or *madarsas* until much, much later. Even today, '*Gharanas*' have produced best musicians, best carpenters are trained at home. All these still grow outside institutions which have destroyed local skills in the name of expertise.

The caste system is a major fault-line in Indian social structure. It is now being used to exploit the poor who do not own land and their skills have been destroyed by the growth of urban institutional and industrial framework where most developments take place to the exclusion of home-grown skills and the dispossessed people, mostly in villages. The change has become worse with the rapid communication system that has ushered in what is now called globalisation. The underprivileged people today do not have access to information, training and education. Hence, the knowledge gap, wealth gap and education



Charles Robert Darwin
= a paradigm shift

gap have widened. Globalisation, as a matter of fact, has created very explosive situations in the developing countries where the rich-poor divide has deepened. Hence, Dr. Pathak argues that it is the time to demolish profession-based caste system which has ceased to be useful to society.

Dr. Pathak, a sociologist, says that social preferences are born out of historical, economic and cultural values which themselves are malleable and changing. Social verities, like inter-group (caste) relationships, economic inequity, and administrative prejudices cannot hold good for all time to come, specially now when physical realities are also seen as 'relative' to various physical factors. And they are changing today as always before. For instance, after Newton, it was believed that there was nothing left in the world to discover. When J.J. Thomas separated electron from atom, this belief toppled and scientists said that end of the world was nigh after use of atomic energy. Stephen Hawking also said in 1980 that world would vanish after explosion which gave it birth 15 billion years ago. Francis Fukuyama (*Trust: The Social Virtues and the Creation of Prosperity*) sees an end to history because of fearsome atomic weapons.

Economist Hazel Henderson believes that economic expansion will, one day, destroy the resource base and the world would cease to exist. While these speculations continued, Lee Smolin, an American scientist, threw a bombshell by opening out a new stream of thought and said that genetic code gave birth to the universe and not evolution as Darwin says. Newton and other scientists sought to explain the mysteries of nature in terms of physics. But none of the claims by scientists, or fears by sociologists and economists came true because as Einstein has said: "*The travel to the new frontiers of knowledge has just begun.*"

"When cosmic truths are not absolute, how can one explain social behaviour and arrangements with finality. Or as ordained by divinity. A society which does not renew and updates its perception, values and beliefs, tends to become obsolete and may fall a victim to the *burden of the past*", says the Sulabh Founder, calling the social orthodoxy as the major source of poverty, illiteracy, backwardness and inter-group conflict. The untouchability, of which scavengers are the worst victims, has to be eradicated from root to ensure survival and growth of Indian society which is a rich legatee of glorious traditions flowing from the Vedas. Dr. Pathak argues while de-mystifying flawed traditions and customs.

WHILE ROME BURNED

Untouchability in India has a historical parallel. Of all the reasons for the collapse of the Soviet system in 1989, the most intractable was the ethnic differences. The Soviet state formed one of the world's most heterogeneous multinational empires. Constitutionally, this was organised in a federation of 15 nominally independent republics, each homeland of a major national group, but in these, there were many ethnic sub-groups with their own lifestyle, culture, social practices and even religion. To be precise, there were 53 ethnically-defined units in the former Soviet Union - major groups among them were Udmerts, Ossetians, Buryats, Karakalpaks, Belorussians, Uzbeks, Ingust, Kazaks and Don Cossacks, Volga German etc. Every republic contained ethnic minorities, including Russians, Tartois, Bashkirs and 30 other nationalities. The critical fact was not the rich tapestry of languages and cultures but the fact that all the ethnic groups were fighting among themselves. However, the difference of race and language was held under check by the Soviet police state, but when the society opened out under *perestroika* and *glasnost* launched by Mikhail Gorbachev, the system caved in and Soviet society disintegrated. Racial tension and ethnic clashes were the sole reasons for the decay of the Soviet Union which was the most powerful country next only to the US.

The Soviet Union population of 228 million people in 1989 had the most comprehensive free education system; 100 million people were studying at schools, colleges and training centres; and it had enormous landmass of 22.4 million square km, or one sixth of the land surface of the globe. Its arable land was equal to the US and Canada combined. Before its collapse, it was the biggest producer of iron, nickel, lead, oil, and natural gas and the third largest producer of coal. It was the world's leading producer of silver, copper, and zinc. The former USSR had 58 per cent of the world's coal deposit; 58.7 per cent of its oil, 41 per cent of iron ore, 25 per cent of timberland; 88 per cent of its manganese, 54 per cent of its potassium salts, and nearly one-third of world's phosphates. (*Source* - Paul Kennedy's book - *Diplomacy*). And, its people were so powerful that they almost single-handedly captured half of Europe after World War-II. And, if the US had not intervened in Berlin (the city was divided in four zones), the Soviet soldiers would have captured the entire Europe. But the system collapsed

largely because of internal contradictions which surfaced after the control of the Soviet police loosened and the people acquired the right to vote and establish their ethnic identities.

India is not as large in landmass (4.1 million sq. km. or only one-fifth of the USSR's). India is divided into 25 linguistic states (against 15 in the USSR), with innumerable ethnic and cultural groups. If one considers the diversity of the North-East, the figures will be mind-boggling. There are 15 major languages in India (there were only 10 in the Hapsburg empire which disintegrated into many Balkan states) and many dialects. If all the castes, sub-castes as mentioned in the Mandal Commission reports are added to those given in the ST/SC lists in the Constitution, they will add up to many times more than was found in the former Soviet Union which caused the decay of the largest power bloc in the world.

But, of all the dividing factors in India, the caste system (untouchability) is most damaging to its social cohesiveness. The other kinds of social injustices, like slavery, economic discriminations and bonded labour, are inclusive and happen within the society's framework while untouchability is exclusive and causes social alienation. And, such excluded and alienated people in India are about 200 million (or the present total population of Russia). Hence, says Dr. Pathak, untouchability (of which scavengers are the worst victims) and the caste system will have to be abolished to avert social disintegration and economic collapse because these social evils cause social segregation, which can destroy any system.

With all its colonial experiences, even Britishers could not realise that once the multinational empire was transformed into a commonwealth of different (sometimes hostile) castes, creeds, and cultures, the results would be more dramatic and far-reaching than could be foreseen. And, because of the existence of ethnic minorities, independence has caused convulsion after the collapse of the Soviet system as it did earlier in India after partition in 1947. However, we seem to be unaware of the fact that untouchability will cause implosion which Indian society cannot stand - no one ever could, not even the Soviet Union which dissolved like a bad Marxian dream. Nor do we take sufficient care to see that this evil system is ended, assuming that once anti-untouchability laws are passed, problems will vanish. And, we merrily go about our daily work, ignoring the caste time-bomb which is ticking fast. Nero also did that while Rome burned.

SOCIAL ENGINEERING

Dr. Pathak says that in order to abolish scavenging, social engineering is necessary to be able to bring about a change in attitude and values. A great society cannot be created by the Government by taking up huge development programmes (like Five-Year Plans) but by a series of small steps taken by ordinary men and women and it is they that add up to make a difference in the situation. Liberal political and economic institutions depend on a healthy growth of civil society which is a complex network of intermediate institutions, including NGOs, media, etc.

The fact is that all human beings seek to have his or her dignity recognised. This desire is the chief motivating force of all human activities. In earlier times, the desire for recognition was manifest in battles fought by kings and emperors to establish primacy in human affairs. In modern times, this struggle has shifted to economic activities when people earn more money than is necessary for their upkeep. And, get social recognition. Or, there cannot be any other explanation as to why so many people earn so much money needlessly, wasting natural resources, creating chaos, and destabilising social equilibrium!! To be true, economic activities beyond the subsistence level are frequently undertaken for the sake of social recognition rather than meeting rational needs. Work status (huge office, lots of chairs, huge cars, etc.) and money are the sources of identity, status and dignity; be it creating a media empire, becoming chairman of an institution or being promoted as chief scavenger - the impulse is the same. No man or woman, however great or saintly, is ever known to have ceased to love social recognition marked by flattery, show of wealth, power and status. Everyone is in the game of getting socially recognised as thinker, good social worker or criminal, feared by good people.

Sulabh team work results in a synergy when the combined power of a group working together is greater than the total power achieved when each of them is working separately. However, Dr. Pathak says that there is no harm in recognising good work of individuals. Social recognition prompts good work; for this reason, scholars, social workers, professionals, etc. are honoured by the state and institutions. Praise, as a matter of fact, is an incentive to good work. For instance, in India scavengers who do the critical work like cleaning places are declared untouchables. No wonder our cities and towns are dirty. But, in the West, scavengers take

food in McDonald's with top men and women of society. Phillip Mitchell of Easebourne village, near Midhurst (West Sussex), had been MBE (Member of British Empire) in the British Prime Minister's first "classless" Honour List of 1995. No wonder, British towns and cities are clean and well-kept. This being a historical truth, Sulabh has taken up social upgradation programmes for scavengers - besides their liberation, education and rehabilitation - to give recognition to their critical services. The *Sulabh International Centre for Action Sociology* has been set up to promote this programme through education, "social adoptions," community meals and in many other ways in an attempt to give dignity, recognition and social status to scavengers by bringing them into the mainstream of community life.

SHARED VALUES

The Sulabh Founder quotes James Coleman while talking about *social capital* which, defined simply, means working together for common purposes in groups and organisations. This concept is based on the assumption that the success of a nation, group or a company is less because of land, labour and capital and more because of skill, knowledge and commitment. This is a situation of "shared values". Or, trust. Francis Fukuyama has divided societies into *high-trust and low-trust societies* and says that the US, Japan and Germany are among "high-trust" societies although they are apologists of rugged individualism. And, India, China, South Korea, France, and Italy are the "low-trust" societies. The level of trust in a society is determined by cultural preferences, historical experiences, religious beliefs, educational level and economy. Fukuyama's view is, however, hotly contested by many scholars who say that the rise in violent crime, civil litigation, breakdown in family structure and social unrest in the US cannot be the defining features of a high-trust society.

This may or may not be true but man's social behaviour cannot be explained in terms of ready models. Economists say that man is driven by self-interest and, thus, he is only a "utility maximiser". On this basic assumptions, the entire capitalist system, beginning from Adam Smith, is built. But, economists cannot explain why people die to save the honour of the national flag, a piece of cloth! The bloody civil war in America (1863) was fought to save the "conscience of the nation". Caesar launched a "thousand ships" in

the Mediterranean at the sight of Cleopatra's nose. First World War was fought to save democracy and the second one was fought to destroy a concept, Fascism. And many generations of men and women perished, fighting for those undefined ideas – honour and conscience. These certainly had nothing to do with "*utility maximisation*". Dr. Pathak rejects the neo-classical assumption that individuals always seek to find the cost-benefit relations in all their decisions. People do not always judge things in terms of economic gain. He says that civil society does not arise out of the logic of advanced industrialisation. People, as a matter of fact, work harder when they know that they are creating a new social order rather than earning more money for shareholders. No war in history was fought to balance budget. This is the central belief of the Sulabh Movement.

As a sociologist, Dr. Pathak says that the human behaviour is too complex to define in economic terms alone. But the endeavour of groups of men and women, who share common values, provides a cutting edge in the competition, specially when the objective is the promotion of social good. Once sociologists were asked to find out why Toyoto Motor Company of Japan was having an edge over Ford that led the US industrial production for three generations. Both the companies are equal in respect of investment, skill, knowledge, management, business spread, infrastructure, etc. Why then Toyoto was winning the race!! Sociologists finally discovered *a cord* and, thereby, hanged the story of superiority of Toyoto over Ford.

In Toyoto Motor Company, any worker in the factory could just pull the *cord* and that will bring to halt the entire assembly line. And, the top man of the factory will come running to that worker to find out his problems – about job, salary, health, education of children or any personal and professional problems. And he will solve the problems on the spot. On the contrary, Ford was governed by labour laws and there was no personal touch in man management. No wonder, Ford workers just did the time-bound work and went home, caring least about factory production. *The cradle-to-grave service* condition makes Japanese workers stakeholders in the company for which they are ready to carry any burden and make any sacrifice. In the US, (or any other country, including India) owners and workers are often perpetually locked in hostility. Hence, production is costly, inefficient and products uncompetitive in price. The *master-slave* mentality governs the industrial relations in India and other developing countries and

that is one reason - and very important one at that - for losing in global competition.

To be true, social workers cannot be terrorised into doing great deeds. Those inside the group believe that their good decisions and planning are responsible for success. This mentality leads to hubris which, in Shakespearean words, precedes the fall. The overweening arrogance also leads to "organisational inertia". Hence, the Sulabh network management system has marked a "*paradigm change*" from monolithic structure (with a man on the top and the whole lot of minions below) to a widely spread-out network that builds an organisation, flexible enough to utilise the knowledge and skill of social workers who come from different cultural, educational and family backgrounds to work for a cause, the full implications of which they may not have understood yet. Sulabh has, thus, developed a *supportive culture* that is open to questioning from below and is tolerant of failure.

Quite a piece with the Japanese pattern, Dr. Pathak has made social workers stake-holders in Sulabh's moral enterprise and has allowed their limitless access (*fateful cord*) to him for any difficulty - job, health, family problems, education, housing, etc. Sulabh provides the "*until-death-do-us-part*" arrangement in a high-trust regime in which workers are made partners in progress, marching together to seek new frontiers, crying - "*faraway hills are the greenest*". This civil society dispensation is also a source of Sulabh's success, besides lofty ideology, firm leadership, strong infrastructure and a viable technology, that provides the cutting edge to the system which is among the largest in the world.

REALISM IS THE WORD

At the conceptual level, the Sulabh Sanitation Movement is considerably influenced by Realism, a philosophical concept developed in Europe in the first half of the 19th century. Realism grew to become an anti-Romantic movement in Germany with its emphasis on the common man. (For Sulabh, it is the scavenger.) Realism is often compared in journalism with accurate and dispassionate reporting of events; a philosophy with its capability of mechanically re-producing visual appearance with extreme accuracy. Or, it is Auguste Comte's positivist philosophy of society with a bare study of facts and situations to find solutions to problems, instead of hunting for the quality person. Realism,

developed in Germany, made Germans a realist and positivist people. Realism turns away from melodramatic picturesqueness and presents reality after close observation. Realism is also a product of the desire to be honest with things and events. The social realism is reflected in hard and direct approach to problems and issues.

Romanticism was developed in France. The Romantic French writers gave fiery slogans which produced the French Revolution in 1789, but since no solution was built in the approach, Napoleon, a dictator, seized the throne. So, it was a transfer of power from the Bourbons to Napoleon; or, from the devil into the deep sea. It was a case of French Romanticism running wild. It was not the case with Germans who organised and expanded their empire to become a formidable force from a tiny Prussia where Bismarck, (Otto Eduard Leopold 1815-98), the son of a land-owning farmer, conjured and united all the German-speaking territories in the neighbouring States. When Bismarck, a hard-boiled realist, was born, Napoleon a French romanticist, was fighting his last battle at Waterloo, near Brussels in Belgium. And the French lost in their romantic adventure while German emerged as a superpower in Europe.

Sulabh is a combination of both the movements in their best traditions; in that it accepts state of things as they exist while finding normative solutions to the problems of the poor. It also accepts as facts the social constraints like casteism, religious taboos and attitudinal problems and works to abolish them without causing violence to the existing social structure, or, without waiting for ideal conditions to be created before intervention. It accepts people and society with all their weaknesses and strength and try to deal with them realistically. The Sulabh Movement marks a departure from the traditional thinking, making everything relative to time and space (*a la Einstein*) by pleading for a return to the basics. "All good things of life are simple and free. When we artificially create demands, problems arise. What we see today - conflict, crisis, competition and social division - are our own creation. And, if like the Biblical apple, we eat it, human race will perish", says Dr. Pathak philosophically.

INDIAN RENAISSANCE

Sulabh represents the Indian Renaissance (re-birth) which was witnessed in the 15th century Europe, immediately following the

Middle Ages that was the intervening period between the downfall of the classical world of Rome and Greece and the coming in of Italian Renaissance which demonstrated many things, including adventure and enlightenment.

The term *la renaissance* was first used by French Writer E.J. Delecluze, to describe the impact made by the "dead" Hellenic civilisation on Western Christendom, namely Northern and Central Italy, in the late medieval period. In general term, it was used to describe the impact of good old values and traditions on civilisation. In Sulabh context, *renaissance* is used by the Dr. Pathak to highlight the need for the revival of old Vedic values which never allowed discriminations in *Aryavarta*, including the caste system and untouchability. The Sulabh *renaissance* also rejects the concept of purity of blood, culture and religion. Dr. Pathak quotes Arnold J. Toynbee to say that claiming racial, religious and blood purity is false. Toynbee says: "The whole human race is a continuing story of different peoples, ideas, cultures traditions, etc. mixing, separating and mixing again (dialectical) to produce the *unity of species*".

In simpler terms Dr. Pathak says: "Our food does not cease to be Indian because we use chilly which is brought to India by the Portuguese, or potato which Britishers brought with them; nor does our morning brew, the celebrated tea, becomes exotic because this herb was discovered by a Chinese saint to keep himself awake during meditation. So, to talk of exclusive national feature is untenable, although there are identifiable ethnic features. Dr. Pathak also rejects the Huntington's (Samuel P.) theory of clash of civilisations." These clashes are the problem of poverty and not of ancestry, language, religion or customs. The clashes, quoted by Huntington, are largely taking place in poor countries which also have social problems of discrimination, social inequality and exploitation. The US is a socially and racially divided society, but there is no cultural clash, as defined by Huntington, nor in Europe which is also a racially divided continent. Gauls, Teutons, Anglo-Saxons, Franks, Goths, Lombards, and Slavs live there in harmony. Excepting the Balkans, a poor region of fighting people, conflicts in Europe were never the clashes of civilisations; rather, in the *Continent of Destiny*, all conflicts since the 100-Year-War took place over building empires. There was no cultural clash as defined by Huntington", says Dr. Pathak.

It was during the Renaissance period that Copernicus toppled Ptolemy's theory (Clandius Ptolemaeus 2nd century AD), who said

the earth was fixed and the sun was moving. It was the Classical Age. During Renaissance, Copernicus (Nicolaus 1473-1543, a Pole) rejected it and said that the earth spinned and not the sun. Copernicus survived the "heresy" but his follower Giordano Bruno (c 1548-1600, an Italian) was burnt alive at the stake in Rome for his "heretical" belief in the Copernican system of astronomy. Ironically, these intolerant periods witnessed great progress in science and art.

Renaissance also demonstrated humanism. It stressed unity and compatibility of truth found in all philosophical and theological systems. It emphasised dignity of man. In Medieval times, life was taken to be penance, to be treated as the noblest and the highest form of human activity. In Renaissance, the humanists looked to the struggle of creation and attempted to exert mastery over nature through science. The Renaissance humanists also looked forward to the re-birth of the lost human spirit and wisdom. The effort during Renaissance was to help man break free from prejudices imposed by religious orthodoxy, to inspire inquiry and criticism and explore new possibilities of human thoughts and action. But nothing like Renaissance happened in India. The Sulabh Sanitation Movement is its nearest approximation because the sources of its sustenance are common knowledge, science, tolerance, spirit of inquiry and criticism, toppling old beliefs and creating a brave new world without violence and bloodshed. Sulabh seeks to achieve these through intensive campaigning, education and experiments.

Every great event has its geographical epicentre. The American Revolution (1776) had Independence Hall in Philadelphia, the French Revolution (1789) started from the State prison house of *Place de la Bastille*; the Revolution of 1848 was sparked off in the Luxembourg Palace where President Louis Blanc examined Communist Manifesto, launched by Karl Marx and Friedrich Engels in London a year before. This movement toppled Emperor Louis Philippe of France, Prince Metternich of Austria and almost totally destroyed the feudal system and *ancient regime* in Europe, paving the way for liberalism of the 20th century. Strangely enough, the Communist Movement was launched in the shop of a German tailor, Wilhelm Weitling, who set up a *Society of the Just*, later re-named by Marx as the Communist League. In the tradition of great events starting from small places, the Sulabh Sanitation Movement also began from a dusty, time-beaten town of Arrah in Bihar where the first two-pit pourflush toilet was set up to later become a great movement.

India is the sixth largest country in the world, spread over an area of 4.2 million sq.km., enclosing within its fold close to a billion people to become the second most populous country next only to China. The cultural, linguistic, (15 major languages), geographical and ethnic diversities have made it the most colourful tapestry woven together over 5,000 years of its history marked by migration, assimilation, conflict and fusion. Karl Marx has said in his *Das Capital*: "It is amazing how a country, invaded so many times in its long history and under the control of alien rulers for hundreds of years, could maintain its identity. It is all because of the richness of its culture which is rooted in villages that did not change with the change in rulers and dictators." It is also because of this diversity that all religions, born in India, talked of universal brotherhood and unity of human species; they did not address to any particular group or race. It may be Buddhism, Jainism or any other religion. Hinduism, for that purpose, is not a religion; it is a pan-India culture which represents the entire mosaic of this colourful assembly of religions and races. Max Muller, who was first to translate the *Vedas* into German language, said: "The more I try to unravel the mystery of India, the deeper it becomes." So amazing is the country, so wonderful its people and their culture.

Working with these historical legacies and within cultural parameters, India has made progress, specially after 1947, in the fields of science, technology, defence capability and food production. It was a case of "begging bowl" turning into "bread basket"; a weak and famished nation flying into space and producing the finest computer chips to better the best in the world. To say there is, however, not to suggest that we have solved all problems; far from it. Regional imbalances, illiteracy, poverty and structural distortions continue to afflict people. Sanitation and social discrimination, specially untouchability, are damaging the social cohesiveness. Sulabh has also taken up these issues, besides producing energy from non-conventional sources, health, human resource development and technical research and training.

AN AREA OF DARKNESS

Sulabh also seeks to prevent environmental pollution. The rapid deterioration of ecological balance, population explosion, urbanisation, industrialisation, destruction of forests, soil erosion

and an ever-increasing number of motor vehicles are the main causes of this imbalance. In the Third World countries, including India, another major cause of environmental pollution is the absence of a hygienic and safe human waste disposal system.

The sanitation scenario of the country at the time of the birth of this movement was appalling. V.S. Naipaul, the British novelist, in his famous book, *An Area of Darkness*, has made elaborate references to the practice of open defecation, the unsightly nakedness and humiliation, specially of women who squat along roads, railway lines and in public places to present a sickening spectacle of a decaying society. The Sulabh Sanitation Movement was a response to this situation.

Sanitation in other countries, specially in the last century when the Industrial Revolution was taking place in the West, has been entirely a civic problem. But, in India, it involved social discrimination also. More than 10 million households in urban and rural areas of the country have bucket latrines, cleaned by a section of people called, *scavengers*, who had the status of untouchables before Independence. It is amazing that the people who kept houses and cities clean were made to suffer a variety of indignities unheard of since the days of slavery in Rome. These scavengers were made to live outside the village and forced to wear bells around the neck to announce their coming, or stamp the ground to keep the people away from their shadow. They were not allowed to wear slippers, nor could they eat fresh food; only stale left-over crumbs collected from houses were eaten by them. Scavengers could not use vehicles; they walked long distances in scant clothes. They always lived in small stinking huts along with pigs where fire would ravage in the summer. In which case they would live under the tree. Nothing like this was heard in any civilised society. After Independence, things have changed for scavengers and they are made equal before the law, but they continue to be unequal in education, living conditions and in many other ways. About 700,000 of them still physically clean and carry human excreta only to suffer social degradation which their forefathers did before Independence.

THE OTHER LINKAGES

Sanitation has many linkages with health, or they are complementary with each other. Hence, Sulabh has taken up

massive health programmes that include primary healthcare, population control, prevention of disease, like AIDS, through awareness programmes and other preventive and curative measures. The Sulabh toilet complexes have been developed into multi-purpose centres of community service which provide facilities like bathing, washing clothes, safe drinking water, first-aid service and telephone. These toilet blocks also work as centres to organise training and other community programmes among slum-dwellers. Sulabh has a wide access to community because about ten million people use Sulabh toilet facilities everyday.

Sulabh is an organised, well-structured institutional arrangement to abolish scavenging, restore human rights to scavengers and create a new sanitation order. It has a viable, nationally and internationally recognised technology and methodology to achieve its objectives. Technology has always been a lever of change. The wheels, spinning-jenny and computer chips, among many others, changed lifestyle, perception and social structures of the time more than any thought system did before. Technology ushered in the Industrial Revolution, demolished Communist empire, changed global relations, destroyed geographical boundaries and war strategies to produce a new global information society wherein what is happening at one end affects the people living at the other end of the world. Hence, when Dr. Pathak thought of launching a movement to abolish open-air defecation and scavenging, he developed an indigenous, culturally acceptable low-cost sanitation technology, first. Sulabh also seeks to abolish this inhuman and cruel practice forever by use of this scavenging-free technology. Sulabh aims at providing toilet in each house and public toilets and bath facilities for the floating population in cities and other places of congregation. It seeks to free scavengers from this subhuman practice and resettle them in other professions after training. And, give quality education to their sons and daughters so that they can compete for jobs in open market and live a good life, fully acceptable and respected by joining the mainstream of society.

The social intervention by action sociologists produces change which finds manifestation in Sulabh strategies that combine the process of helping and learning through social action. Sulabh represents conscious efforts to induce systemic change leading to the uplift of the poor. Its technology puts a premium on

smallness and self-sufficiency. In fact its simplicity and smallness make it appropriate to meet the local needs. The technology is appropriate against economic and social background. Its relevance goes beyond the boundaries of states and regions. The Sulabh technology of excreta disposal, therefore, represents a choice between modern growth and traditional stagnation. Borrowed concepts and imported methodology can hardly be a substitute for appropriate technology. Sulabh also represents an investment in man. The change that is being witnessed in the field of sanitation and upliftment of the downtrodden has not been forced from above. Dr. Pathak provides alternatives, leaving the target group to make the right choice. The initiative for adoption comes from within.

REPLICABLE PARADIGM

To be true, Sulabh is a concept which envisages a change in social dispensation and human relationships. Sir James Chadwick (1891-1974) was a lawyer by profession who wrote a comprehensive report in London (*The Great Sanitation Report*) that highlighted the grim sanitation situation in England. His report produced a great impact on the sanitation situation in the latter half of the last century. The Sulabh Sanitation Movement has gone beyond sanitation; it has a strong conceptual underpinning encompassing social and cultural revolutions for transforming the social structure of India. The shift in the universally replicable paradigm from scavenging-based sanitation to scavenging-free two-pit affordable system of sanitation is a revolution, because it is sharp transition from one paradigm to another supported by a new technology. For instance, pastoral civilisation ended with the invention of the wheel, a technology developed by Assyrians, and the Industrial Revolution began with the invention of spinning-jenny. Modern civilisation is marked by computer chips (cyberage). History will suggest that the road to social revolution is extraordinarily arduous and there has always been a technology behind it. Einstein says: "Science and technology, not tears and rhetorics, will change society and abolish poverty."

The Sulabh Sanitation Movement is dialectic (thesis, anti-thesis and synthesis) in nature. Marx said that under his famous *dialectical materialism* political and historical events happen due to conflict of social forces caused by man's material needs. The

practice of scavenging in India is a product of thousands of years of history and it continued because of many social contradictions (untouchability, caste system, etc.) and this cruel system expanded to meet the man's "material" needs to clean toilets in city centres. Marx sought to correct social distortions by abolishing Capitalism and "*expropriating the expropriators*" while social reformers sought to achieve this through education, campaign, law and persuasion. Quite a piece with this hallowed tradition, Sulabh reforms proceeded in practical and achievable ways, step by step, wrapped up in an attractive package comprising technology, liberation of scavengers, their training and education, rehabilitation and, finally, their social upgradation when the last among scavengers will join the mainstream of social and national life.

The Sulabh Sanitation Movement is all-inclusive; it has attracted enduring groups of adherents, away from competing practices. And, it was sufficiently open-ended also to include social and legal reforms, population control, education, and many other related issues for the re-defined groups of Sulabh practitioners who seek to solve problems. The change in the previous pattern of "*non-solution*" to another pattern of finding "*solution-based*" social reform is called *Sulabh paradigm* which is an accepted model that can be replicated. In English grammar, for instance, the verbs "*go, went, gone*" are paradigms because they can be reproduced in a variety of ways, conjugating a large number of other words and phrases. In this standard application, the paradigms function by permitting the replication of examples. Sulabh has paradigms because it (Sulabh model) can be replicated in the fields of sanitation, environment protection, healthcare, education, human excreta-based biogas production and so forth. A paradigm can be related to different conditions in different societies facing the same problems like sanitation, healthcare, etc. Sulabh is also called a revolution in the field of sanitation because it clearly marks a departure from the current practices, combining in itself more than cleaning toilets and streets.

The transformation of paradigms in physical and social sciences and their successive transition from one paradigm to another by revolution (or movement) is the normal development in all mature sciences. For instance, today's textbooks of physics tell us that light is photon (i.e. quantum-mechanical entities) that exhibit some characteristics of waves and some characteristics of particles. This was the concept developed by Planck. But,

Einstein later said that light is transverse (acting in cross-wise direction) wave motion and it bends, a theory on which he got Nobel Prize. The dilemma of light did not end there. Instead, there had been a number of other competing replicable paradigms. One group took light to be particles emanating from material bodies; for another, it was the modification of the medium that intervened between the body and the eye; still another explained light in terms of an interaction of medium and emanation from the eye.

It is, thus, evident that even in physical sciences where the factor like the speed of light is constant, there is a variety of opinions, one being as good as the other. And, even when the factor is constant, paradigm can be a guide only to a limited extent or in a specific time-frame. But in social sciences, human behaviour is the basis and it is not a constant factor. Therefore, the inference drawn from the changing human behaviour is variable. For instance, historians say extreme poverty causes revolutions. But almost all Bastille, including the French, were caused not in poor societies. Poverty stuns and benumbs the poor; only half-met demands and social disparity cause social upsets. Economists says poor societies cannot save, but in India, a poor society, the saving rate is among the highest in the world.

NOT BY REASON ALONE

George Bernard Shaw once observed that progress depends on the unreasonable man. "The reasonable man adapts himself to the world while the unreasonable man persists in trying to adapt the world to himself." Therefore, for any change the world must look to unreasonable man (or woman). Dr. Pathak quite fits the bill; for he persisted in changing society and its attitude towards the dispossessed and the poor. For his *unreasonableness*, he had to run the gauntlet; his parents punished him for touching a scavenger and society condemned him as a Brahmin becoming scavenger. His unreasonableness has finally succeeded. However, change will be best absorbed if it comes slowly, says Dr. Pathak. For instance, a frog put in the cold water will not stir or agitate if the water is heated up slowly and gradually. And it will not agitate again when it is finally boiled dead in the hot water. Slow and gradual changes (heating up) gives time for the people

to absorb change without agitation. Hence, Sulabh is more a movement than revolution, working to bring about a gradual change in the system without causing damage (boiling) to its structure as Naxalite movement sought to do.

In the beginning, Sulabh Sanitation Movement was started by social workers but, later distinguished persons from different disciplines joined it, including engineers, scientists, academic, architects, planners, administrators, doctors and others. Over a time, it became a self-reliant and sustainable agenda for growth. Sulabh has its own philosophy and ethos which stand for eternal verities like respect for all cultures, religions and mutuality of interests of all mankind. This effort has been acclaimed by the State and Central Governments and various national and international agencies, including HUDCO, WHO and UNICEF, UNDP, HABITAT. The World Bank has accepted the principles advanced by Dr. Pathak. UNDP has also evaluated its technology and methodology, prepared a manual and passed it on to the countries of South-East Asia, Latin America and Africa for adoption. Sulabh has a strong scientific background and data processing facilities which produce replicable models. It has research (social and technical) facilities for training, demonstration and human resource development. Apart from these, there are blueprints for implementation, maintenance and follow-up action. It plays a crucial role in institution building. Use of non-conventional sources of energy is the need of the hour with the fast depleting fossil fuels of the world. Sulabh has also made progress in R&D in the fields of bio-energy and bio-fertilizer from human waste.

Twenty-eight years is not much of a time in the historical continuum to sit back and take a stock of the developments. Thucydides, a Greek philosopher and historian, says in his magnum opus, *The Peloponnesian War*, that events should not be judged earlier than 100 years after their occurrence. This time-gap is necessary to give a perspective to be able to judge men and events objectively. However, Thucydides did not respect his own guidelines and wrote the history of time. It may be too early to write the Sulabh story but half-told history of experiences will provide material for future historians to write about this great movement. For, in perspective, it may seem that the really influential people in the past 100 years were not Hitler or Churchill, Stalin or Gorbachev, but Freud, Marx, Einstein, and others who changed nothing except the way we think. Francis Crick is not a household

name; yet he, with James Watson and Maurice Wilkins, discovered the genetic code, DNA, and so created the science of microbiology on which much of our future may depend. Sulabh has also changed our attitude and the way we think. And, that marks it out from many other movements.

The Sulabh story is, however, still unfolding itself. At 28-year milestone, we simply pause to ponder over its successes and failures and how best it can have a date with destiny. For, Dr. Bindeshwar Pathak has always believed that future is not inevitable. Man can influence it, if we know what we want it to be. His plan is to create a new social order out of the old without a shot being fired, or a man being killed.

The fact is that, India's 120 million "untouchables" are set for a fight to demolish the caste-based structure. Their weapons are education, vote and guns. The Dalits (one-sixth of the population) are also instigating a social revolution to topple the 2,500-year-old *juggernaut* of the Hindu caste system which condemns a man to his caste-determining whether he becomes a doctor or a scavenger. And, in this battle, power is gradually shifting to Dalits. Sulabh favours this change but it should be peaceful and without destroying the basic social structure. "Or else," Dr. Pathak says, "in the bloody social conflict, the ashes of Dalits and non-Dalits will become indistinguishable". ●

Sanitation is good economics.

- Chadwick

A tale of two sanitation movements - Chadwick and Sulabh

India has made considerable progress in the fields of science and technology (including space science), education, healthcare, medicine, food production, etc. Many Government and non government agencies and organisations have been working, most of them away from limelight, to make this progress happen. The leading among them is the Sulabh International Social Service Organisation which is a major institutional initiative to promote environmental cleanliness, human rights, primary education, vocational training, rural development, health and hygiene, and non-conventional sources of energy. And, develop users friendly sanitation technologies to promote these causes.

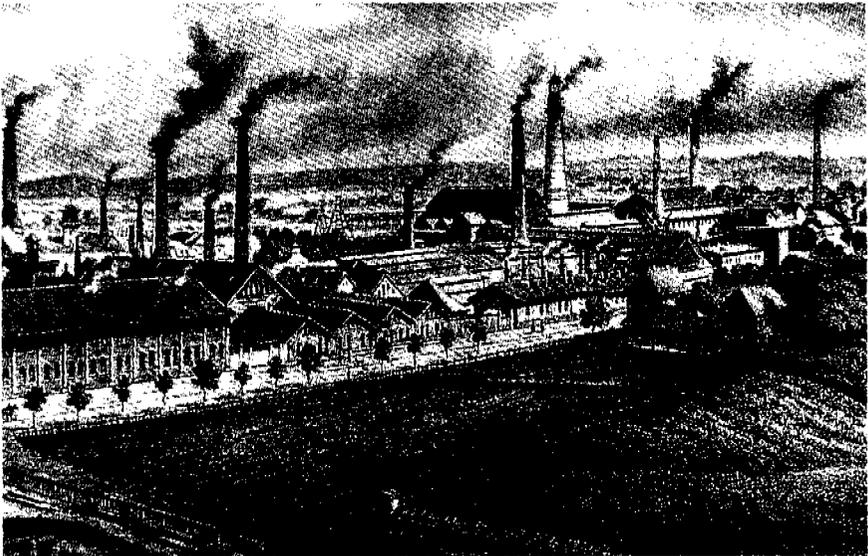
India's image in the world took a beating when plague broke out in Surat in 1994. Poverty is not the sole reason for lack of sanitation and public hygiene. In India, private cleanliness co-exists with public dirt. While people keep the insides of their houses clean, the public areas such as corridors, staircases and surroundings are shockingly dirty. Open nullahs and gutters, uncleaned garbage, with people defecating along the roadside, polluted water sources, and open food-stalls with flies - are common sights in most cities. Overcrowding in ill-ventilated tenements, infested with insects and rodents, is another common feature in cities. No wonder, our population is highly vulnerable to several sanitation-related diseases, ranging from the common cold to pneumonia, tuberculosis, leprosy, typhoid, cholera, jaundice, malaria, *kala azar* and venereal diseases.

A scenario, quite similar to the one described above, existed in the West in the 18th century in wake of the Industrial Revolution when garbage used to be flung out of windows onto the streets! Contaminated drinking water was collected in dirty vessels from common taps. At workplaces, men, women and children worked long hours in unventilated factories. People surrounded by filth, often fell sick. Writers of those times have described how the medieval European habit of not taking bath and not washing

below the belt was responsible for a large number of deaths. The stink on the roads was literally unbearable. In America in the last century, it was impossible to walk through the streets of mid-Western cities without having encounter with pigs and stray cattle. People used to throw excreta out of their windows which farmers would gather at night. Hence, the name, *night-soil*.

A strong public sanitation movement started in England in the mid-nineteenth century with the submission of the sanitation report by Mr. Edwin Chadwick, Secretary to the Poor Law Commission. Mr. Chadwick also discovered close correlation between unhygienic environment and the spread of infectious diseases. The sanitation report prepared by him ushered in the *Great Sanitation Revolution* in the Western world. The report also led to cleaning up of many places, including reservoirs where infectious agents which cause disease (germs and other micro-organisms) as well as insect and animal vectors (mosquitoes, rats, flies, etc.), were thriving and breeding.

Mr. Chadwick, who was convinced that people *were poor because they were sick*, was a prominent figure in both the commission that reported on the *Poor Laws* in 1834 and the commission that reported on public health in 1844 and 1845. As



A view of Birmingham, an English town, where the Industrial Revolution first began, and then, came the Chadwick sanitation movement

secretary of the poor-law commission, he wrote the famous *report: An Inquiry Into the Sanitary Conditions of the Labouring Population of Great Britain*, which was published in 1842. These reports were embodied in legislation and established national supervision of health, safety, sanitation and social problems. The Factory Act of 1833 was the immediate forerunner of modern industrial legislation, and the *Liverpool Sanitary Act of 1846* provided for health officers and borough engineers for that city. The *Nuisances Removal and Diseases Prevention Act* and the *Baths and Washhouses*



In Middle Ages, people used to throw excreta from their houses on the roads below. A sketch

Act, passed the same year, were preludes to the Public Health Act of 1848. The first general housing acts were passed under the sponsorship of Lord Shaftesbury in 1851. With the subsequent introduction of the sewerage system, provision of clean drinking water and safe disposal of garbage, the incidence of infectious diseases decreased dramatically. There is evidence to suggest that Indians also knew the correlation between sanitation and diseases and, hence, set the stringent norms of personal hygiene. It was around 1860 that it became clear that diseases were caused when certain harmful organisms (*pathogens*) entered the body. These organisms were spread by air, food, water, insects, animals and even by people. As they were invisible to the naked eye, they were labelled micro-organisms or *microbes*.

CHADWICK REVOLUTION

Ms. Bakhtaver S. Mahajan, an eminent scientist of the Homi Bhabha Centre for Science Education and the Tata Institute of Fundamental Research, Bombay in her book, *Microbes and Disease*, (Oxford University Press 1996) writes elaborately on the two movements

and says: "The Sulabh movement, launched in the country by Dr. Bindeshwar Pathak in recent years needs special mention. A rough analogy can be drawn between it and the *Great Sanitation Movement* in the 1860s in the West. History reveals that standards of public hygiene deteriorated considerably in the early nineteenth century, specially in England. This was the time when the Industrial Revolution was at its peak and increasing numbers of people were daily crowding into towns and cities for jobs. Entrances of houses and any odd corners were used as lavatories, garbage was found all around, and people rarely bathed. Diseases such as cholera, tuberculosis, and typhoid took many lives.

"By the 1840s, the scene started to change as several public-spirited men which included writers, lawyers and other professionals, examined the living conditions of the poor. Edwin Chadwick, a lawyer, studied this situation in a systematic manner, and ingeniously grasped the strong correlation between a dirty environment and the spread of infectious diseases. (This correlation

was apparently known to Indians also and perhaps can account for many of our strict norms of personal hygiene.) Chadwick became convinced that cities and towns needed to be cleaned up and in 1842 submitted a report, *Sanitary Conditions of the Labouring People of Great Britain* to the Council of London. Among other recommendations, he urged the public construction of simple family houses with a garden and a toilet block away from residential quarters. Public parks were also a prominent feature of his city-plans. But his most radical recommendation was his emphasis on an *underground sewerage system which would collect*



This is how scavenger families live - far and away from city centres

liquid household wastes and discharge it far from residential quarters onto an open municipal ground. This report ushered in the Great Sanitation Revolution in the western world. The Public Health Acts of 1845 and 1875 and The Royal Commission of 1898 initiated civic action in sewage collection and treatment.

"Unwittingly, Chadwick's report led to the elimination or cleaning up of the many places - reservoirs - where disease-causing agents used to breed and thrive, which among others included mosquitoes, rats, flies, animals, and, of course, a whole world of microorganisms. Today we have come a long way from Chadwick's time in the treatment of sewage and other wastes, with these processes becoming highly automated and specialised. The situation is quite dismal on the sanitation front in India. Flush-toilets and underground sewerage systems are taken for granted by many in urban areas. In cities too, sanitation and waste water disposal are often the last facilities to be laid out in the process of city planning. Even today, several suburbs of the city of Mumbai do not have an underground sewerage system! Sewage treatment is often a tardy and incomplete process. In villages and small towns, the situation is worse. Recent attempts of the government to introduce 'shauchalaya' in different districts is making rather slow progress where sanitation is viewed as a convenience, and not as a measure which promotes good health. According to the UNICEF, 'sanitation should not be treated just as an annex to water supply, nor should it be considered only in relation to water supply programmes... the disposal of excreta and household wastes and aspects of personal hygiene such as hand washing, are even more directly related to health status than is water supply'."

TOWARDS A SOCIAL REVOLUTION

Ms. Mahajan traces history of Sulabh and says: "In 1970, Dr. Bindeshwar Pathak, founded the Sulabh Shauchalaya Sansthan, later named Sulabh International Social Service Organisation. The primary objective of this organisation is to prevent environmental pollution by promoting low-cost sanitation facilities. Equally important, this movement has freed lakhs of people from the humiliating scavenging job imposed on them by a cruel societal order. Sulabh is a complete movement, radical in its approach. While trying to solve the problems of sanitation in the country, it also seeks to rehabilitate scavengers and their family members

into the mainstream. This is done by providing them with education and training for several types of jobs. Dr. Pathak has given a fresh impetus to the work initiated by Mahatma Gandhi and Babasaheb Ambedkar. Provision of clean drinking water and sanitation facilities are important for any society. In India these are available to a very small fraction of our population. Absence of sanitary facilities forces people to defecate and urinate in the open and, thus, pollute the soil and air with harmful microorganisms. However, to provide water-borne sewerage or even septic tanks, as is done in some cities, is an expensive and a difficult proposition. The untreated or partially treated sewage is often dumped in the seas and rivers making them highly polluted.



Liberated scavengers take to street sweeping

"In 1970, Dr. Pathak came up with his simple design of Sulabh Shauchalaya (latrines pourflush toilet with twin leach pit). The latrine consists of a squatting plate or a pan with a steep bottom and side slopes and a gas-trap with a 20 mm waterseal. The waterseal checks the escape of foul gases and microbes into the atmosphere from the leach pits. About 1.5 to 2 litres of water is sufficient to flush the excreta into the leach pits through pipes or covered drains. One pit is used at a time and both pits are covered by airtight covers. The gases disperse and the liquid infiltrates into the soil through holes in the pit lining. When one pit is full, excreta is directed to the second pit. In about 18 months, the contents of the filled up pit get digested into manure and are safe for handling. Now, the pit is emptied and can be used again after the second pit is full. Thus the two pits are used alternatively and continuously.

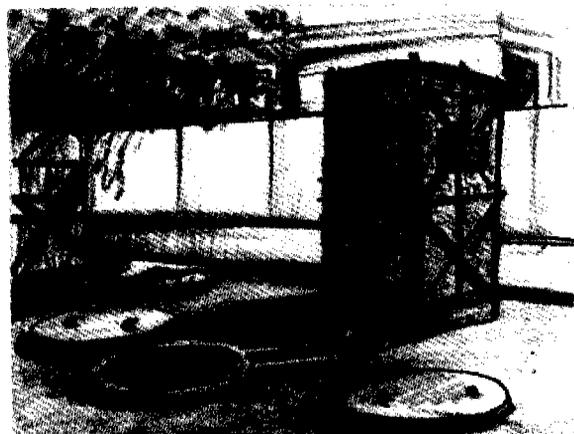
"The advantages of Sulabh Shauchalaya are many: they

are hygienically and technologically appropriate, low-cost and easy to construct with locally available materials; the design and specifications can be modified to suit the needs and the paying capacity of the users; there is no odour or flies or insect breeding; they can be located inside the houses; they can be constructed in different physical, geological and hydrogeological conditions and do not pollute surface or ground water, if proper precautions are taken in construction; their maintenance is simple and does not require the services of a scavenger or large volumes of water; fertiliser is made available; there is high potential for upgradation as it can even be connected to sewers when sewerage is introduced in the area; a low-volume flushing cistern can also be attached and the whole set-up needs very little space. Dr. Pathak has an impressive list of achievements to his credit. Some of these are: evolving a system of rehabilitating, educating and training of scavengers, and their adoption by elite members of the society; entry of scavengers into temples; and setting up of public toilets and baths, and biogas plants for generating energy from human excreta. Recognising his yeoman services, he has been awarded several national and international awards, including the Padma Bhushan, K.P. Goenka Award and the International Saint Francis Prize."

HOW THE TWO DIFFER

Between the Chadwick revolution of 1840 and the Sulabh Movement, started in 1970, there is a gap of 130 years during which significant developments took place in the fields of science and sanitation technology. The problem also grew during this period, specially in the developing countries, where demographic expansion and mass migration to cities posed problems not different from any Mr. Chadwick could envisage in London of only two million people (the present population of London is about 10 million). However, the Sulabh Movement can be compared with the *Great Sanitation Movement* launched in the West in the 1860s to raise the standard of public hygiene which had deteriorated considerably in the early nineteenth century, specially in England where the *Industrial Revolution* was at its peak and the people were leaving villages (read Oliver Goldsmith's *Deserted Village*, 1770) and crowding the city centres for jobs, education and good life. Charles Dickens has vividly described the situation in many of his books. Western cities, specially in London which led the

Industrial Revolution, had become too crowded. The Great Plague of 1664 and Great Fire of 1665 had almost resulted in a new London which continued to be a livable place until the Industrial Revolution again changed the character of the city. It may be recalled that Karl Marx (1818-83) also worked in the dirty and oppressive London during that time when exploitation and filth marked the lives of industrial workers. And, he produced a book (*Das Capital*, 1867) after which the world was never the same again. By 1840, the scene started changing when the public-spirited men, including writers, lawyers, and other professionals, examined the living conditions of the poor. Mr. Chadwick was the acknowledged pioneer in the field.



A low-cost Sulabh toilet model

The difference between the two great sanitation movements is distinct; while the Chadwick revolution was largely limited to awareness campaign with stress on sanitation, the Sulabh Movement talks of a set of human behaviour and change in social dispensation. It also talks of human

rights to basic services, including sanitation, which is linked to the *right to survival*. A large number of children die of sanitation-related diseases and, hence, by denying an access to basic sanitation facilities these children are denied right to survival which is guaranteed under the *Universal Declaration of Human Rights* signed on December 10, 1948. Dr. Bindeshwar Pathak, Founder, Sulabh Movement, promotes partnership and alliance between civil society and the Government. Sanitation is also linked with right to know, right to good health, and clean food. Dr. Pathak says sanitation is a different kind of right, no less important than any written in the Declaration. Sulabh provides a new, indigenous, culturally affordable and appropriate technology to solve sanitation-related problems. The Sulabh Sanitation Movement has a comprehensive programme which includes low-cost

technologies, education campaign and a whole range of people's initiatives to promote cleanliness. Dr. Pathak says sanitation is also a behavioural problem which should be addressed adequately to bring about a new sanitation order in India. The Chadwick report laid stress on the sewerage system because then rivers had enough water to carry untreated city sullage.

Yet another difference between the two movements is that of disparate historical conditions. For all we know, England had never had the problem of open defecation since Norman times. But in India, out of 950 million people, about 750 million defecate in the open - along railway tracks, in open places or in fields, causing filth, and diseases. It is now a proven fact that many diseases can be caused by open defecation which include diarrhoea, dysentery, jaundice, cholera, hepatitis, etc. Also related to sanitation is a human rights question. The dry toilets are still cleaned manually by about half-a-million scavengers who are most depressed and exploited people in India. Ironically, they are hated even by those whose excreta they carry on their head. Unlike the Chadwick movement, the Sulabh Movement addresses both the problems: sanitation and manual scavenging. The Sulabh human waste disposal technology is also a radical departure from the sewerage system which makes the former eminently suitable for use in both individual and cluster houses. This novel sanitation system is a benchmark technology which will keep our habitat centres clean and people healthy. As a matter of fact, Sulabh has given a new turn to the sanitation movement by evolving low-cost pourflush water-seal toilet with two pits for on-site disposal of human waste as a viable alternative to the sewerage system and bucket latrines and, thus, also abolish manual handling of human waste.

PARADIGM SHIFT

The Chadwick revolution indicated a sharp change in the situation by creating awareness and a new approach to the sanitation problem. The Sulabh Movement is a paradigm shift which indicates a radical departure from the conventional sanitation practices. For instance, when Darwin says the man is a result of evolution, it was a paradigm shift from the earlier concept based on the *Book of Genesis* that God wanted man, and man appeared from the blue. The Sulabh technology, methodology, human rights perspective to sanitation and the question of liberation of scavengers

- these and others are entirely different from *one-issue Chadwick revolution* of cleaning up places, killing disease-causing microbes and laying sewerlines. Sulabh works for a change in human behaviour and attitude; technology is one component, (and very critical component at that) of the Sulabh movement which has also a much larger spread, and much greater impact on the sanitation situation and on the life of the people than any revolution had before. Sulabh is a concept, with strong technological underpinning, that seeks to usher in a new social order unlike the Chadwick movement which sought to clean up London city.

On Sulabh initiative, Central and State Governments and civic bodies have changed laws, adopted the pay-and-use community toilets system as a accepted practice, funded Sulabh projects on biogas, training and rehabilitation and toilet conversion and liberation of scavenger. A special clause has been included in the *20-Point Programme*, highlighting the importance of sanitation and abolition of scavenging. On Sulabh persuasion, the former Prime Minister of India, Mr. P.V. Narasimha Rao set the date (1997-end) when scavenging will be abolished. Working vigorously at the national and international levels, Dr. Pathak persuaded Mr. Maurice Strong of Earth Summit to make sanitation a part of *Agenda-21* and separate it from water supply to get adequate funds. At the Water Supply and Collaborative Council meetings at Oslo and Rabat, Dr. Pathak convinced the world community that

sanitation is a co-efficient of economic growth. Sanitation which was a local affair, is now on global agenda.

The Chadwick sanitation revolution was a response to the problems in London, while the Sulabh Movement is a response to the problems in India and also of those developing countries with the similar



The Sulabh Founder receiving the K.P. Goenka Memorial Award from the then Vice-President of India, Mr. R. Venkataraman (1984)

problems of demographic expansion, migration to cities, illiteracy, poverty and the inability of the administration to lay sewer lines to dispose of city waste into rivers after sewage treatment. Today, even in Paris only 40 per cent of city waste is treated and the rest is discharged into river Seine, untreated. No wonder World Bank, UNDP, WHO, UNESCO and other national and international agencies have recommended adoption of the Sulabh low-cost on-site human waste disposal technology and methodology to be adopted in all the developing countries. And, Sulabh technology and methodology has been declared as a *Global Best Practice* at Habitat-II conference in Istanbul in 1996. In recognition of its humanitarian work, Sulabh has been given the *Special Consultative Status with the Economic and Social Council of the United Nations*.

Although the two sanitation movements took place more than a century apart, they have one thing in common – both worked to realise the dream of a clean and happy society where people can live well and grow in happiness and good health. ●

**An ounce of work is better
than tonnes of promises.**

- Chinese proverb

Areas of major initiative

The *Sulabh International Social Service Organisation* is the leading non-profit outfit, working to promote sanitation and prevent environmental pollution which are critical components to a healthy and productive society. The growing population and the consequent strain on shrinking resources have produced slums, violence, houselessness and human miseries which are evident among the people living on the edge. The growing urbanisation has also produced serious shortages of houses, forcing people to live in shanty colonies without toilet facilities. Beginning from a small town in Bihar (a State in India), Sulabh now works virtually all over the country with the help of a large work force of over 35,000 committed volunteers belonging to various disciplines like administrators, financial and management experts, engineers, architects, sociologists, scientists, media persons, etc. It has infrastructure in 22 states and two union territories.

It is now an established fact that most diseases are caused by bad sanitation. People build houses but not toilets, indicating skewed attitudinal and cultural preferences. Official agencies are sinners no less. They also do not give sufficient stress on sanitation, most specially toilet facilities, while building community houses. The snag in sanitation programmes is also technological. The sewerage system is very costly and not sustainable. There is neither enough water in rivers to flush out city effluents, nor enough money to set up sewage treatment plants. Even France has been able to treat only 40 per cent of Paris sewage; the remaining waste flows into the Sein river, untreated.

The Sulabh human waste disposal system is a radical departure from the sewerage system and that makes it eminently suitable for use in both individual and cluster houses. This novel sanitation system is a frontier technology which will keep our habitat centres clean and people healthy. As a matter of fact, the advent of Sulabh International in the field of sanitation in 1970 gave a new turn to the sanitation movement by evolving low-cost

pourflush water-seal toilet with two pits for on-site disposal of human waste as an alternative to bucket latrines, thus also abolishing manual handling of human waste. The organisation has also been able to improve the environmental sanitation and community health and hygiene.

A NEW TECHNOLOGY

The Sulabh toilet system is a cost-effective and most appropriate technology option. It needs much less water (only two litres) than is needed (10 litres) for flushing out the conventional water closets (WC). Thus, it conserves water which is scarce in most developing countries. Sewerage and septic tanks are very expensive which the developing countries cannot afford. The toilets built on Sulabh technology have a large variety of designs to suit different income levels, topographical terrains and local resources. It is economically and socio-culturally acceptable to the people. It is free from foul odour and can be built by indigenously available materials. It is easy to build and easy to maintain. With high potential of upgradation, it can also be connected to sewers easily when introduced in the area. It does not need the services of scavengers – makes available high quality manure and soil conditioner. (See a separate chapter on Sulabh technology page 60)

SELF-SUSTAINABLE SYSTEM

A Sulabh's innovativeness is best demonstrated in the public toilet system operated on the *pay-and-use* basis which is self-sustaining. Along with public toilets, Sulabh provides bathing washing and urinal facilities with separate compartments for men and women. Some more amenities like cloakroom, public telephone, primary healthcare, drinking water, school for children in slums, etc. have also been provided at some places. The charges are nominal; the disabled, children and those who cannot pay are allowed to use the facility free. The authorities, therefore, do not have to provide funds for the maintenance of the public conveniences for a period upto 30 years which is an unique example of community participation. In addition, these toilet complexes have provided dignity and safety by providing facilities for defecation and bathing in privacy, specially for women who are the greatest beneficiaries. Sulabh plays the role of a catalyst between and among government, local authorities and the users of community facilities.

The objectives of Sulabh Sanitation Movement are:

● **To restore human rights and dignity to scavengers**

Liberating of scavengers from unhealthy and subhuman occupation of manual handling of excreta by converting bucket privies into Sulabh Shauchalayas (pourflush toilets with two pits for on-site disposal of human waste), getting rehabilitated the relieved scavengers and their wards in other occupations after training, helping in social upgradation of scavengers and their promotion as equals in society, setting up information and employment exchange centres and helping scavengers in getting employment either in government or non-governmental organisations, opening English-medium schools to provide education among sons and daughters of scavengers along with others and helping scavengers build their houses away from slums so that they can be taken out from the stinking environment.

● **Prevention of environmental pollution**

(a) Sulabh seeks to educate people not to defecate in the open, in lanes, bylanes, parks, streets, by the sides of roads of railway tracks etc. (b) Motivate people to get bucket privies converted into Sulabh Shauchalayas and to have toilet facility in houses. (c) Provide community toilet with bathing, washing, and urinal facilities on the pay-and-use basis in slums, and for pavement dwellers, rickshaw-pullers, floating population and also for those communities in whose houses toilets cannot be constructed due to space constraint. (d) Persuade people to plant at least 5 trees per family and also plant trees around public toilets for the protection of environment. (e) Harness non-conventional energy sources from human waste and save fuel and forests. (f) Procure manure from Sulabh Shauchalayas and use it to raise farm productivity. (g) Promote job-oriented education and primary healthcare. (h) Form groups of people from all walks of life throughout the country and abroad to build public opinion against social evils and for the cause of economically poor and neglected sections of society. (i) Create new employment avenues by training change-agents for integrated rural development. (j) Promote consultancy, research and development in technical and social fields. Promote diffusion of innovations, education, motivation and awareness through mass communication.

Dr. Bindeshwar Pathak studied various designs of toilets

and work done in this field in India and abroad and developed Sulabh Shauchalaya which is the most suitable, affordable and a social-culturally acceptable technology. This toilet design has been widely accepted by the people because it is low-cost; it requires only two litres of water to flush. It does not require the services of scavenger nor does it pollute air; it provides manure on the spot, can be cleaned and easily maintained by house-owners themselves. The two pits work alternately for several years. It can be easily connected to sewer.

The Central and the State governments, various national and international agencies, like UNDP, UNICEF, WHO, World Bank, etc., have accepted Sulabh Shauchalaya as the most appropriate low-cost technological option. They have suggested the adoption of this system in India and other developing countries.

The Government of India has included low-cost sanitation as a vital component in the Integrated Development of Small and Medium Towns (IDSMT) Programme. The Housing and Urban Development Corporation (HUDCO) also gives financial assistance



Above: Scavengers were not allowed to draw water from community wells. Below: Sulabh protested against this practice and set up hand-pumps at many such places

for low-cost sanitation to various categories of beneficiaries. The Ministry of Urban Development, Government of India, provides subsidy to local authorities for conversion of dry or bucket privies into Sulabh Shauchalayas and construction of toilets in houses.

LIBERATION OF SCAVENGERS

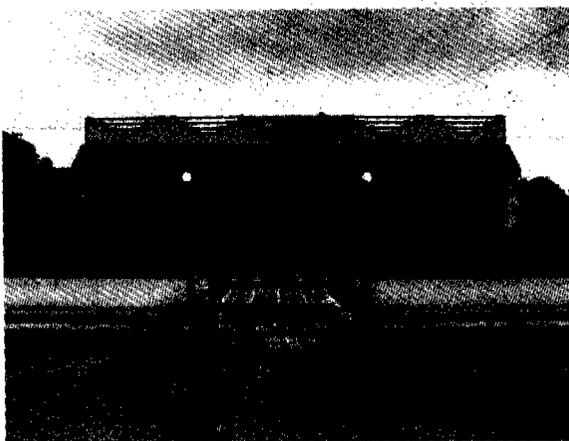
The point 11 in the Government of India's 20-Point Programme of 1986 relates to 'Justice to Scheduled Castes and Scheduled Tribes'. It aims at eradication of scavenging and undertaking special programmes for the rehabilitation of scavengers. Sulabh International Social Service Organisation is fully involved in achieving this objective.

PUBLIC TOILETS AND BATH

The year 1974 may be recalled as a landmark in the history of sanitation when the system of operating and maintaining community toilets with bathing washing and urinal facilities with attendant's service round the clock was initiated on the pay-and-use system with people's participation without any burden on public exchequer or local authorities in Patna.

Sulabh complexes have been welcomed both by the people and the authorities due to their cleanliness and good management.

These have electricity and 24 hours water supply. Soap powder is supplied free to users for washing hands. The complexes have separate enclosures for men and women. The users are charged nominal charges for using toilets and/or baths, but use of urinal facility is free. Children, disabled



A Sulabh community toilet-cum-bath complex
in Surat, Gujarat

persons and those who cannot afford to pay are allowed to use the facility free of charge.

Availability of bathing facility is a boon to the poor. End to open defecation had resulted in improvement of environment, community health and quality of life, thus raising the productivity of the people. The facilities of special toilets, combined with bath having shower facility, cloak-rooms, telephone and primary healthcare aids, have also been provided in some of the Sulabh complexes. For the Royal Government of Bhutan Sulabh International Social Service Organisation has constructed and is operating and maintaining one complex on pay and use basis at Thimphu, Bhutan.

BIOGAS FROM HUMAN EXCRETA

Sulabh International Social Service Organisation is the first to generate biogas from human excreta on a large-scale at public toilets. The Gandhi Maidan at Patna has been lighted by converting biogas generated at Sulabh toilets into electricity by a dual fuel engine. Sulabh is assisting in achieving the objective of the Ministry of Non-conventional Energy Sources (MNES), Government of India, by putting up human excreta based biogas plants all over the country. So far 62 biogas plants have been installed and the biogas is being utilised for lighting the complexes and cooking purposes. The organisation also proposes to utilise biogas to supply warm water for bathing and warming bodies and hands during winters at Sulabh Shauchalaya Complexes.

SULABH INTERNATIONAL CENTRE FOR ACTION SOCIOLOGY (SICAS)

The Sulabh International Centre for Action Sociology (SICAS), set up in 1991, takes up programmes to develop an understanding of social and economic problems of scavengers and evolve new ways to bring them into the national mainstream. In pursuance of these objectives, the following projects are taken up.

TRAINING AND REHABILITATION

Sulabh International Social Service Organisation takes up the

twin operations of liberation of scavengers by conversion of dry/bucket privies and training and rehabilitation of liberated scavengers and their wards. Sulabh organises programmes to train them in various vocations, such as driving, mechanic, tailoring, typing, canework, carpentry, leatherwork, masonry, etc. They are also educated on health, sanitation and personal hygiene. Sulabh established the first training institute exclusively for scavengers at Patna, now shifted to New Delhi. It has established such an institute at Bombay in collaboration with State government and is running it successfully.

SOCIAL UPGRADATION

The liberation of scavengers and their rehabilitation in other professions is not enough; no less important is the upgradation of their social status so that they can be absorbed into the mainstream of social life and untouchability can be abolished. Towards this end, Sulabh has persuaded a large number of eminent persons, judges, politicians, ministers, journalists and eminent lawyers to "*socially adopt*" one scavenger family each and help them get jobs and other benefits permissible under the law. The adopter visits the adoptee (and vice-versa) openly so that they can get the social respectability. This programme is getting a very encouraging response. In October 1988, Dr. Pathak visited the Nathdwara temple in Udaipur (Rajasthan) alongwith 100 sons and daughters of scavengers and some Vedic Brahmins. Earlier, Harijans were not allowed to enter that temple. Dr. Pathak organised Puja and community meals with Harijans, both at Patna and in Delhi. Participation of the so-called high caste people in such functions was an indication that Dr. Pathak succeeded in bringing about a measure of change in society, dominated by orthodox Hindus.

ENGLISH-MEDIUM PUBLIC SCHOOL

Sulabh International Social Service Organisation has opened an English-medium public school for children of scavengers who are given free modern education in a variety of subjects, with thrust on vocational training, including computer and office management. The Sulabh Founder says that education is a great redeemer; it is only through education that the final solution



Schoolchildren, mostly from scavenger families, studying at Sulabh English-medium Public School, New Delhi

can be found to any social problem, especially when it comes to abolishing attitudinal prejudices. The scavengers' children are taught through English-medium so that they can compete as equals in open job market. Hindi is taught as national language along with Sanskrit; the latter being a source of Brahmin dominance in society. Sulabh

plans to set up such schools in all states. In non-Hindi speaking states regional languages will also be taught besides English, Hindi and Sanskrit.

SLUM CHILDREN'S WELFARE PROGRAMME

Slum growth is ubiquitous in most developing countries. Urban areas in India share this problem - with a difference. Most of scheduled castes, including scavengers live in slums. And, children are worst hit. They symbolise social drift. Many among them are close to coming in conflict with law. For them, Sulabh has launched a self-development programme. Its main thrusts are education, personal hygiene and environmental awareness. These activities are held during afternoons. They are brought to the Sulabh school and given training in a variety of job skills.

SLUM HOUSEWIVES LITERACY PROGRAMME

Literacy among women is low and lower still among those living in slums. Keeping this in view, SICAS has started a community-based literacy programme. Drawing upon the community resources as well as its own existing resources, it launched the programme in 1997, in Delhi. Space and a few volunteers were provided by

the community. The Institute provides the services of two Sulabh volunteers and teaching material, including books, stationery, black-board, etc. Not only women and girls learn alphabets but they are also exposed to functional literacy. Frequently they participate in social functions and workshops. A large number of housewives benefit from this programme.

SOCIAL RESEARCH

In order to keep abreast with changing social realities, the Institute has all along attached great importance to social research. For this, SICAS has provided adequate in-house facilities, including word processing, computer for data analysis, etc. It invites outside specialists to do evaluation and research studies. It also collaborates with national and international agencies. Main research areas have been problems of weaker sections of society, social intervention strategies, processes of change and development and the manner in which these percolate to the grass-roots.

The following distinguished persons have generously given donations to promote the social integration programme for the children of depressed classes. Mr. J.C. Patel, Ahmedabad; Mr. Sudeep Mazumdar, New Delhi; Mr. Surendra Mishra, New Delhi; Mr. S. Ganesh, Bangalore; M/s Merrecca A Runnen Little, Netherlands; M/s Chandra Agencies, Chennai; M/s Geejay & Lobal, Chennai; Mr. V. Haidar Ali, Chennai; M/s Om Murunga Timber, Chennai; Mr. A. Kanagonel, Chennai; Mr. Vinayaga, Chennai; Mrs. Vasundhara Raje, New Delhi; M/s Hindustan Petroleum Corp. Ltd., New Delhi; Mr. S. Roy, Calcutta; Mr. Earl Kessler, New Delhi; M/s Moniquel Palleshberg; M/s Arora and Chaudhary Associate, New Delhi; Mr. K.L. Bajaj, New Delhi; Dr. Florian M. Stenberg, New Delhi; M/s Paraswanth Charity Trust, Ahmedabad; The Manager, Ahmedabad; M/s G.Chandra Godavitarne, New Delhi; Mr. Gangadhar Jha, New Delhi; Mr. Prakash K. Bhagwati, Ahmedabad; M/s Joane Erache, New Delhi; M/s Jinanand Trust, Mumbai; Mr. Sidharth M. Goel, New Delhi; Mr. G.S. Roshia, Chandigarh; M/s Jianand Trust, Mumbai; George Menam Perampil, Belgium; Mr. B.G. Jadhav, Mumbai.

GRANTS-ON-AID

1. Grants-in-Aid are being given to many of the courses offered

by Sulabh Vocational Training Centre by the Ministry of Human Resources Development, Government of India.

2. Most training courses offered by Sulabh Vocational Training Centre are recognised by Directorate of Training and Technical Education, Government of National Capital Territory of Delhi.

TRAINING AND EDUCATION

In order to inculcate job skills to implement, operate and maintain various low cost water supply and sanitation schemes and human waste-fed biogas plants, the Sulabh International Institute of Technical Research and Training runs refresher/training courses for those who are working or intend to work in these fields. In the courses due stress is given on the importance and need of software inputs, viz. awareness, health, sanitation, education, personal hygiene, motivation, publicity, etc. which are crucial for the success of social programmes of this nature. Training modules and literature are prepared. Experts in different disciplines available with the Institute as well as invited from outside are engaged for training.

OVER TO VILLAGES

Sulabh has evolved an appropriate strategy of rural development by creating horizontal as well as vertical linkages between the local people and the development agencies via a network of local youth who will be trained as change-agents to promote rural development programme by motivating the rural folk and acting as facilitators between the government agencies as well as voluntary organisations engaged in this campaign of creating model villages.

The Sulabh International Institute of Rural Development (SIIRD) has taken up a village called Teekli, in Gurgaon district of Haryana, with the aim to transform it into a model village. After a series of surveys and meetings with the local people of Teekli, 'health' seemed to be their top priority as per the need-identification. Hence, SIIRD has launched a health survey, wherein the family health record of all the 1006 households has been completed; 3920 persons (85 per cent) have gone through complete medical check-up; a hundred per cent check-up of pregnant women (pre-natal check-up) is done; 70 per cent have procured family-planning services; around 2000 people have been immunized



Awareness and education programmes are being conducted through schools under a project funded by the Ministry of Environment and Forests, (through National River Conservation Directorate) in St. Mary's Inter College, Etawah, UP

through vaccination (including 989 under-five) and a blood-bank of 150 voluntary blood donors has been created so far. Around 300 Sulabh toilets have been set up in this village of 600 houses.

Another area in which SIIRD has contributed significantly is the promotion of environmental sanitation and community health through community action. This has been achieved

through the implementation of a new school training model. This model was put in practice in Andhra Pradesh. It has been received well by Overseas Development Assistance (ODA). Under the Andhra project, SIIRD conducted a series of orientation and intensive training courses at all the six Municipal Corporations of Andhra Pradesh, namely Hyderabad, Vishakhapatnam, Vijaywada, Warangal, Guntur and Kurnool. The total number of those trained during the first phase was 1,000 teachers, 300 students, 200 sanitation workers and 60 public health engineers. For each course and each category of the trainees, the training modules were specially designed, keeping in view the perception level and the interest background of the target groups.

The training modules developed were primarily based on the principles of participatory learning. As such, the emphasis was more on discussions and experience sharing exercise than on the class room teaching. A three-day sanitation and community health exhibition was organised at Guntur, where trained teachers and students exhibited visual aids which they prepared during the training programme.

EDUCATION ON ENVIRONMENT

The Ministry of Environment and Forests (through the National River Conservation Directorate (NRCD) has sponsored the Yamuna cleaning programme through education, awareness and campaign. SIIRD is the implementing agency. Under the project, education on Yamuna cleaning and the environment was started in four Western towns of Mathura, Vrindaban, Agra and Etawah. Under the project, Sulabh has launched the participatory development programme known as "*Better School: Better Living*". The highlight of the project was organising groups of local motivators through the orientation training of 400 teachers. As many as 800 students were trained to work as change-agents who will persuade their family members to participate in the programme of the National River Conservation Programme (NRCP). During the awareness campaigns, campaigners displayed posters, wrote articles for newspapers and staged street shows to educate the people on the dangers of river pollution and importance of clean water use.

NFL's ROLE SIGNIFICANT

National Fertilizers Ltd. - a public sector undertaking of Government of India has sponsored a pilot project on sustainable rural development in tribal area of Bastar district of Madhya Pradesh of which SIIRD is the implementing agency. The project has been developed with the specific purpose of evolving a unique model of Government and NGO partnership in initiating community action based approach of alleviating poverty through employment generation in tribal villages. The emphasis is on total development through awareness, self-help and skill development of the people. The major areas of activities under the project are: sanitation and community health, vocational training to tribal men and women, non-conventional sources of energy, agricultural development and women's literacy and job training.

Sulabh seeks to provide: one toilet to each household; access to safe and clean drinking water to every villager; medical aid to each individual family welfare services to each (eligible) couple;

healthcare to pregnant mothers; immunization, and paving village lanes and roads with bricks; and training village youths in toilet construction, hand-pump installation and maintenance, smokeless chullahs, biogas and adult education. The stress is also on strengthening the cottage industry base by utilising local resources as well as the locally available skill.



Women entrepreneurship being promoted through vocational training under a NFL sponsored project on rural development in tribal district of Bastar, Madhya Pradesh

PEOPLE'S MOVEMENT

Sulabh plays an important part in identifying ways and means of solving common social problems through people's participation on self-sustaining basis. Sulabh has proved that people themselves, and not the Government, can solve the problems on the self-sustaining basis and the NGOs should play the role of a catalyst in making it happen. The major women's problems are lack of education and skewed social structure which is set against them in gender bias, especially in developing countries. Women hold key to the success of sanitation programme; they can bring about lasting changes in the family and society. Sulabh's strategy is to ensure full participation of women in the sanitation programme by discouraging the prejudices flowing from casteism, religious radicalism and untouchability which have also been the sources of backwardness and poverty. Sulabh seeks to combat these by organising the poor in cooperation with others for creating an equitable and just social order.

Community participation has been central to the Sulabh Movement which has laid special emphasis on health education and creating awareness about sanitation and environment. It has set up primary healthcare centres at community toilets. As a result of this, considerable awareness has been created about the

importance of personal hygiene and sanitation. It has helped in bringing about a change in social values and hygiene habits of the urban poor and helped them adopt cleanliness and sanitation as parts of their daily routine. In fact, Sulabh works to turn development process into a people's movement with the people themselves becoming agents of change. Its innovative approach provides sustainable environmental sanitation strategy to change the habits and attitudes of the people. This approach has helped in building the capacity of the community and usher in a new self-sustaining sanitation order in society. Literacy, specially of women, is the major ideological foundation of the Sulabh Movement which is a knowledge and technology-based organisation which seeks to change social norms and preferences by education, campaign, persuasion and pressure.

Sulabh's success should be measured by its knowledge and radical ideas. Knowledge is the perceived value of a society while idea is the response to a problem. When we mix ideas with knowledge, we get capabilities to promote inter-group social relationship across divergent disciplines and perspectives. Norms are "unwritten, unstated, mutual understandings as to what is appropriate behaviour under given sets of conditions". In a society or country, customs are norms. How do norms differ from rules and laws? Authorities enforce laws and social pressure enforces norms. Violation of a law may not result in social disapproval, but violation of norms does. Norms are the community's view of an action or behaviour. Prohibited action can be *mala in se* or *mala prohibita*. *Mala in se* means inherently evil. *Mala prohibita* means they are illegal only because the rules say so.

This is the ideological perspective of Sulabh and for that matter this movement is different from any social movement launched in India so far. ●

**"Small steps by people somewhere,
turn into giant strides everywhere".**

- John F. Kennedy

How small steps turned into a giant stride

When the new Constitution was promulgated at midnight on January 26, 1950, milling crowds gathered all over the country to greet the new republic being set up in a land under British rule for over 200 years. In the midst of festivities, stood a class of frightened people, shrunken in poverty, untouched and hated even by those whose excreta they carry on the head. Scavengers are the defenceless people, perpetually waiting for a redeemer who does not seem to be coming. The Constitution provided protection to groups of castes and classes, but no special mention was made about scavengers whose plight was worse than those of Harijans. Scavengers are untouchables among untouchables, Harijans among Harijans. The extent of their deprivation and degradation are more central to the philosophy constitution than those of Harijans.

This was about the time when the matter was raised all over the country. In Patna, the Gandhiji birth anniversary celebrations committee set up a cell in 1968 and Dr. Bindeshwar Pathak was appointed as its convenor to find a way to abolishing scavenging in India and save scavengers. This was the beginning of Sulabh Movement, a mighty institutional and voluntary effort to uplift the most wronged people whose forefathers lost in battles and were made to carry human excreta on the head. Hence, we have scavengers as a class of people and not a caste. This also marked the beginning of the battle against scavenging. People of all religions – Hindus, Muslim, Sikhs (in north-east) and Christians (in Goa) – are scavengers.

BLOW-BY-BLOW ACCOUNT OF SULABH SANITATION MOVEMENT

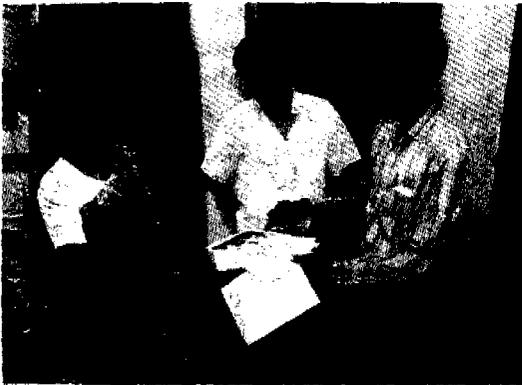
1968 - SULABH TECHNOLOGY: Dr. Bindeshwar joined the liberation of scavengers' cell of the Bihar Gandhi Centenary

Celebration Committee in 1968 when Dr. Pathak was entrusted with the task of finding out an alternative to scavenging. On the basis of the researches done in India and abroad, Dr. Pathak modified and developed a technology of two-pit pourflush toilet (popularly known as Sulabh Shauchalayas). He also succeeded in convincing on the effectiveness of the two-pit pourflush toilet system not only to planners and administrators but even to engineers in India and abroad, being himself a non-engineer and a social scientist. Today, engineers not from India alone but even from the World Bank have accepted that the pourflush toilet system can be an alternative to scavenging, open-air defecation and unhygienic, unsafe systems of human waste disposal like trench and borehole latrines etc. in the developing countries of the world.

1970 - THE ORGANISATION: By the time, Dr. Pathak found the alternative to scavenging, the Bihar Gandhi Centenary Celebration Committee, which Dr. Pathak had joined, was dissolved by the Government of Bihar. This year, he founded a non-profit voluntary social organisation, Sulabh Shauchalaya Sansthan, (now known as Sulabh International Social Service Organisation) to carry out the objectives of Sulabh Movement, i.e. the liberation of scavengers from sub-human practice in India. And this way, the seeds of the Sulabh Movement were sown in the year 1970. To get familiar with the living conditions of scavengers, their habits, social mores, history and their geographical spread, Dr. Pathak visited, lived and dined with them in their bastis.

1970 - PAN-INDIA SPREAD: The mighty mass movement has now spread all over the country with a cadre of about 35000 Sulabh volunteers, working right atop the mountain at Vaishnav Devi, deep down in South and in farthest corners in the east and the west in 18 States and 700 towns with, organisational spread, the like of which has never been set up and managed by any social voluntary organisation so far. Sulabh does not take any aid, or subsidy from internal or external agencies; raises its own resources to run the pan-India system and campaign against social evils and help the weaker sections of society.

1972 - CATALYTIC AGENT: Apart from finding out technology, Dr. Pathak developed a methodology which also spelt out how a non-profit voluntary social organisation could work as a catalytic institution between the Government, local bodies, and the



Sulabh trains women from slums to function as change-agents

beneficiaries. It was felt that the Government alone could not fulfill this important objective of liberating scavengers from sub-human occupation. Since most Indian people are illiterate, house-to-house contact and campaign in local languages for the liberation of scavengers was suggested by him. The methodology was first adopted by the

Government of Bihar and now it has been adopted by the 18 States Government and two Union Territories.

1973 - SCAVENGERS LIBERATION: During the past 25 years, he have brought this programme from micro-level to macro-level. In 1973, he has put up just two Sulabh Shauchalayas for demonstration in the compound of Arrah municipality, a small town of Bihar, and within 19 years Sulabh converted some 600,000 bucket latrines into Sulabh Shauchalayas throughout the country; more than 30,000 scavengers have been liberated and more than 50 towns made scavenging-free. This technology has now been recommended for South-East-Asia, Africa and Latin America and other developing countries like Pakistan, Myanamar, Bangladesh, Sri Lanka, Nepal etc.

1974 - PAY-AND-USE SYSTEM: In 1974 itself, Dr. Pathak gave another concept of maintaining the community toilets and baths on the pay-and-use basis. Before 1974, the public latrines in India were regarded as hell. Nobody was able to find a solution to this problem. Dr. Pathak found one and, on that basis, about 3,000 public toilet complexes are being kept absolutely clean, spick and span in 18 State and two Union Territories in 700 towns, including metropolitan cities of Delhi, Bombay, Calcutta and Madras. Sulabh complexes are used by over six million people a day. These toilets are the cleanest place in the locality and are used largely by the people who have no private toilets of their own, mostly in slums and by the floating population of the towns.

And, such people are quite large in numbers. The Sulabh public toilets are beautifully constructed. The one year Haji Ali, Bombay, is a model complex funded by Indian Tobacco Company. The idea of maintenance of public toilets and baths have attracted the attention of Bharat Ratna J.R.D. Tata who got constructed one such public toilets complex near Metro Cinema in Mumbai under his personal supervision. Sulabh has, thus, saved people from the indignity of open-air defecation in parks, along roads and railway tracks.

1978 - HISTORICAL SEMINAR: Seeing the success of the scavengers, liberation movement in Bihar, the Ministry of Works and Housing, Government of India, in collaboration with WHO and UNICEF, organised a National Seminar at Patna in 1978. This was the first historical National Seminar on conversion of bucket latrines and liberation of scavengers. At this seminar, representatives from the Planning Commission, Ministry of Health, Ministry of Works and Housing, international agencies like WHO, UNICEF, World Bank, and the Secretaries and Chief Engineers of all the State Governments participated. And, the diffusion of the ideas of liberating scavengers and the maintenance of public latrines and baths started from Bihar and now this movement has spread throughout the country.

1980-81 - LEGAL PROTECTION: We persuaded the Ministry of Home Affairs, Government of India, to include liberation of scavengers and their rehabilitation programme on the whole-town approach basis under the scheme "Implementation of PCR Act in 1980-81 and two towns of Bihar, namely Biharsharif and Purnia, were taken up for the first time in India. In 1981-82, three more towns of Bihar, namely Daltonganj, Chaibasa and Madhubani, were taken up. Later, the programme was passed to other States. The State Governments agreed to provide alternative employment to liberated scavengers and, hence, all of them got jobs. No one has become unemployed so far. The Ministry of Welfare, Government of India, later took charge of this programme.

1985 - TRAINING AND REHABILITATION: With the help of the Ministry of Welfare, Government of India; Welfare Department, Government of Bihar and the Bihar State Scheduled Castes Development Corporation, Sulabh started training and rehabilitation programmes for the wards of scavengers in different

trades like short-hand, typing, motor driving, mechanics, masonry work, carpentry, canework, etc. And, by now 3,000 children of scavengers have been trained. On this pattern, two more institutes have been set up in Maharashtra and Delhi. This programme will be extended all over the country.

1985 - TECHNOLOGY EVALUATION: The UNDP (World Bank) after evaluation for the technology of pourflush toilet and methodology of the maintenance of public toilets and baths on the pay-and-use basis developed by Sulabh passed it on to the countries of South-East-Asia, Africa and Latin America for their adoption.

1986 - PCR ACT: The credit goes to Dr. Bindeshwar Pathak for persuading the Ministry of Welfare through the Government of Bihar to provide the facilities, like stipends etc. to the wards of Muslim and Christian scavengers also for training and rehabilitation. Earlier, these were available only for Hindu scavengers. This was a major breakthrough; otherwise the wards of scavengers belonging to Muslim and Christian communities would have been left out and the movement for their liberation and rehabilitation would have suffered a setback.

1988 - SCAVENGERS IN TEMPLE: Dr. Pathak solved the problem of entry into Nathdwara Temple in Udaipur, Rajasthan, for prayers in 1988.

The controversy of entering the temple had taken a serious turn and so many attempts, made by others, failed. The situation became so serious that the then President of India, Mr. R. Venkataraman wanted to lead the Harijans into the temple. Even the political leaders and the State Government officials had to go to temple with police protection. This



The community meal with scavengers and their families is a process of bringing them into the mainstream of social life

attracted my attention and Dr. Pathak with 100 scavengers and orthodox Vedic Maithil Brahmins of Bihar entered, as stated earlier, the Nathdwara Temple, offered prayers and remained inside the temple for more than two hours, reciting bhajans and kirtans. Thereafter, all the scavengers and the whole group took meal together in a local hotel of Nathdwara. This whole programme was performed without police protection.

On return from Nathdwara Temple, Dr. Pathak along with scavengers and Vedic Brahmins were given audience by the then President Mr. R. Venkataraman, the then Vice-President, Dr. Shankar Dayal Sharma and late Prime Minister Mr. Rajiv Gandhi. This act of Dr. Pathak was quite in line of Dr. Ambedkar who led a group of Harijans to draw water from a public tank, Chador Talen at Mahad in Kolaba district in 1927 and led another satyagraha to establish the right of the untouchables to enter the famous temple of Kalaran in Nasik in 1930.

1989 - CASTELESS PUJA: On his return from Nathwara, Dr. Pathak launched a campaign to help the Scheduled Castes offer prayers in temples and performing puja at their homes by Vedic



A great communicator

Brahmins. Also, he started common puja and dinning programme where members of the Scheduled Caste community do fasting, sit on the puja and prepare Prasad. They also prepare food for lunch or dinner. After the puja is over, the prasad and food are distributed by Scheduled Caste

members to all, including to Vedic Brahmins, who also eat with them. This programme which is continuing since then, has got wide acceptance.

1990 - SOCIAL UPGRADATION OF SCAVENGERS: To improve the social status of scavengers in India, Dr. Pathak has launched a movement to socially upgrade them. This is a novel concept. There was a question mark as to whether after liberation, training and education, scavengers and their children will have status in society to be at par with so-called upper caste people in India. To socially upgrade the scavengers' status in society, Dr. Pathak started a social upgradation campaign, called Sulabh Sansar. Under this scheme, one family of high status in society has to make friendship with the scavengers who will ask them to come to have tea, breakfast and dinner in his family. When there is a function in either family, both of them will participate in it. With the association of these people, status of scavengers will go up to be equal to other high-status people. This programme has taken off very well. So far, 5,000 scavenger families have been "adopted" by high status people, including judges, advocates, journalists, ministers and planners. Among them are Union Dy. Commerce Minister, Mr. Salman Khurshid, Planning Commission member Ms. Chitra Naik, the Times of India Editor, Mr. Dilip Padgaonkar.

1992 - AWARENESS CAMPAIGN: In February 1992, Sulabh organised a "National Seminar on Liberation and Rehabilitation of Scavengers" in New Delhi in which vice-chancellors, professors, planners, administrators passed a resolution to make it a people's movement. The seminar was inaugurated by the former President of India Hon'ble Giani Zail Singh. Dr. Pathak regularly takes a series of steps to create social awareness against the unfounded beliefs and prejudices. He organises conferences, seminars, workshops, plays and folk dances. The attempt is to involve a large number of people from all walks of life in order to speed up the pace of the movement.

1992 - "EDUCATE, ORGANISE, AGITATE": On the "educate, organise and agitate" pattern of Baba Ambedkar, Sulabh has set up an English medium school in Delhi for sons and daughters of scavengers wherein education is given in three principal areas: general theoretical education, compulsory vocational education (knowledge of office management, short-hand, typing and computer training), optional vocational education (intensive training in specific vocations) so that they may not have to wait in long queues for employment. This will also enable them to be self-employed or get jobs. The school has half scavengers children and half the number

from other families so that there may not be discriminations. This unique experiment will be extended to other states.

1992 - HOUSING FACILITIES: Sulabh has started his new endeavour to provide housing facilities to scavengers and take them out of the stinking and unhealthy living conditions. A survey of 1000 scavenger families has already been done in Patna and attempt is being made to get land from the Government at nominal price and loan from HUDCO in order to build houses for them. A similar attempt is going to be made in other states. ●

**Give me the place and I will lift
the world. - Archimedes of Syracuse
who invented levers and pulleys.**

Sulabh Shauchalaya – A benchmark technology that drives Sulabh revolution

Until 1750, the level of development all over the world was the same. American-Indians, Indian-Indians, Mexican-Indians, Africans, Figians – all were nomadic, roaming, searching for food and shelter. This was a free world in the real sense of the word. The inequality came with the invention of steam engine which started the *Industrial Revolution* after which the world was never the same again. Conflict, war and pollution accompanied the development and good living. Since then, man has been reshaping the world according to his needs and desires. He has covered the land with roads and rails, traced shipping routes across the oceans, raised cities and factories upon the continents.

Commenting upon the forces that have governed this process, Professor Friedrich Dessauer of Germany has said: "When the archaeologists, who uncover skeletons, are in doubt whether these

are remains of true man or of pre-human forms, the question is settled if they find tools along with the bones – flint knives, arrow heads, or fist-hatchets. For, only true men used tools. What that means is simply this: that man has



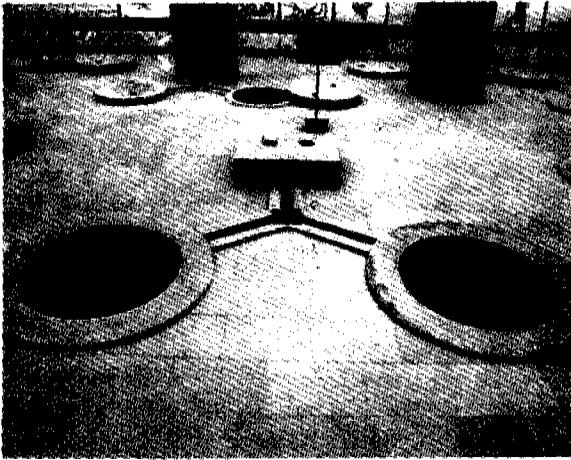
**Discoveries on
Your Doorstep**

been a technician from the moment he first stepped forth upon this earth. Faced with problems in his struggle for existence, he has created tools and conceived processes to protect himself, to improve his lot and to fight nature's adversities. In so doing, he differentiates himself from animals, which must submit to nature because they do not possess the ability to make useful implements. Archaeological finds show that man has constantly been creating new tools through all the hundreds of thousands of years of his history. But the creative process took place in slow stages and with infinite toil.

Originally the purpose of that infinite toil was to make life easier with the aid of implements. Then man built railways, motor cars and aeroplanes in order to move from place to place faster, to *shorten* distances, so to speak. He invented the telephone, radio, television and, finally, *internet*, thereby abolishing distance completely. He has conquered space and time to enter the outer space. His greatest triumph, the fission and fusion of atomic nuclei, has unleashed the energies hidden in the heart of matter - an act that has changed the world. In brief, technology is the *lever of change*.

The Sulabh technology is more so because it has "*swept-away*" the previous technologies, marking a radical departure from the concept and practices of sanitation in India. Technology is the study and conversion of the natural, the built, or the conceptual world, leading to the creation or refinement of socially useful methods, tools, or products. It is the applied use of scientific principles. The early domestication of cattle as draft animals and the development of telescope for astronomical or navigational information or of programmed computer instructions to monitor space flight are the later adaptations of scientific principles. Over the millennia, humans have applied their innate and expanding intelligence to gain control over the natural environment so as to alter the quality of technology used to make war and peace, both.

The toilet concept in India has passed through the Hegelian sequence of thesis, anti-thesis and synthesis. The thesis (a given fact or situation) was the open-air defecation; anti-thesis was the pit toilet (septic latrine system and other pit toilets) and, synthesis, (which is a combination of various innovated designs), is the two-pit Sulabh toilet system which has many features of earlier designs. Thesis (open defecation) was the conventional practice based on belief, religious sanction (that one should not defecate near the



A SOLUTION: The view of a two-pit pourflush Sulabh toilet which is a safe and hygienic way to dispose of human excreta.

habitat) and availability of space. The second phase was digging up pits and defecating into them and so forth; it was a masculine concept because only men could do that in open fields. The third phase (*Sulabh phase*) concept is caring, accessible, emotionally satisfying for its exclusiveness (defecating is a very private human behaviour), humane, acceptable, relaxed,

globally acceptable and culturally appropriate. This is the Hegelian dialectical process.

This historical process of evolution has been witnessed in all fields of technology since swords and shields were invented to fight battles. As a matter of fact, in the second half of this century, nothing new has been invented - the earlier inventions have been innovated, updated and changed to become what they are today. For instance, computer was only an evolution from *Abacus* which Greeks had invented. The Greek word *Abacus* means *the calculating board*; later it was developed into *Napier's bones* by a Scottish mathematician and the inventor of logarithms, John Napier; again it was refined into *Pascal's arithmetic machine* by the French Philosopher Blaise Pascal (1642), and again into Leibniz "Stepped Reckoner" (1671) by Gottfried Wilhelm Leibniz. And, much, much later (1946) into electronic calculator. The modern-day computer had to travel over two centuries to become the most revolutionary technology today. Similarly, locomotives, aeroplane, helicopter, submarine, photocopier, X-ray machines and also as mundane as the lock that we put on our doors have been through the Hegelian process of thesis, anti-thesis and synthesis. They are the end result of a long process. The Sulabh concept has also been through Hegelian dialectics to become a revolutionary technology that has enormously changed the behaviour and lifestyle of man. The Sulabh

technology is seminal because it has introduced a number of new features which were not in the human waste technologies that it has superseded. Coming as it does at the end of Hegelian sequence, *Sulabh Shauchalaya* thus becomes a benchmark technology for further research and reference.

No doubt, the conventional sewerage system is an ideal solution to human waste disposal. It satisfies most public health criteria. But, it requires enormous water for its proper functioning. The capital cost of its construction is also very high - much beyond the economic capability in the present stage of development. The operation and maintenance cost is also beyond the capacity of the poor countries. Although the sewerage system was introduced in India in 1870 and the entire five year plans allocations for sanitation have been spent on sewerage, yet hardly 232 towns and cities (out of 4,689) have been sewered. None of them, however, covers the entire municipal area, leave alone the adjoining suburbs.

Septic tanks, another on-site sanitation system, cost almost two and a half to three times more than that of low-cost pourflush system. It has many other drawbacks. Safe disposal of its effluents poses a problem. Septic tank has to be cleaned after every one or two years. The wet sludge taken out is a health hazard and at times gets mixed up with fresh night-soil. The sludge has, therefore, to be discharged at a safe place. Emptying the septic tank is not easy either. For cleaning the septic tanks and disposal of sludge, scavengers are needed. The traditional quantity of 14 litres of water is needed for flushing. Though the design of septic tank was developed nearly 400 years ago and introduced in India about 150 years ago, yet less than 20 per cent of the houses, even in urban areas, have septic tank latrines. Both sewerage and septic tanks are, therefore, not suitable technologies to solve the problem of insanitation.

These technologies also led to the continuance of a large number of bucket (or dry) privies and the practice of open air defecation all over the country. Considering the vastness of the country with its divergent culture, social customs and attitudes together with variations in climatic, geological and hydrogeological conditions and low-income of the people, designs of latrine should meet the needs of rural and urban population, important among them is the environment which influences thoughts and habits of man.

SULABH SHAUCHALAYA

As stated earlier, sewerage is the ideal solution for the disposal of human waste, but its cost is prohibitive. Septic tank is another alternative, but this is also costly and it has the problems like periodic cleaning and disposal of sludge which is a potential source of mosquito breeding and other health hazards. Pourflush latrine with two pits, popularly known as *Sulabh Shauchalaya*, is an answer to the problem of safe disposal of faeces. *Sulabh Shauchalaya* consists

of a pan with a steep slope 25° to 28° and a trap with 20 mm waterseal needing 1.5 to 2 litres of water for flushing. The pan and trap of conventional design, which are used with flushing cisterns, should not be used in a pourflush latrine with leach pits, as it would need more water for flushing



and the pit may not function properly. The excreta is carried into leach pits through pipes or covered drains; one pit is to be used at a time.

The liquid infiltrates and gases disperse into the soil through the holes in the pit lining. When one pit is full, excreta is diverted to the second pit. In about 18 months rest period, the content of the filled pit get digested and become safe manure for handling. The pit can then be conveniently emptied and is ready to be put back into use after the second pit is full. Thus, the pits can be used alternately and continuously. The sludge of the pit is a good manure for use in horticulture or agriculture. The cost of emptying the pit can be met partially from the cost of manure made available. This technology opens out new possibilities to promote sanitation.

THE ADVANTAGES

The following are the advantages *Sulabh Shauchalayas* have over other technologies:

- hygienically and technically appropriate; socio-culturally acceptable,
- low-cost and easy to construct with locally available materials,
- design and specifications can be modified to suit beneficiary's needs and affordability,
- eliminates mosquito, insect and fly breeding; can be constructed in different physical, geological and hydrogeological conditions; free from health hazards and does not pollute surface or groundwater, if proper precautions and safeguards are taken during construction,
- can be located within the house as it is free from foul smell and fly/mosquito nuisance; can be constructed on upper floors of houses,
- pits are generally designed for three-year desludging interval, but if desired, they can be designed for longer periods or it can be reduced even to two years,
- the maintenance of Sulabh Shauchalayas is easy and simple and it costs very little,
- it needs only 1.5 to 2 litres of water for flushing, while conventional flush toilet needs 13 to 14 litres of water,
- less space than is required for septic tank latrine,
- does not need scavengers for cleaning pits or disposal of sludge; this can be done by the householders himself or by a labourer; makes available rich fertilizer and soil conditioner, and
- it can be easily connected to sewers; a low-volume flushing; cistern could be attached to avoid pour flushing and in Sulabh Shauchalaya vent pipe is not necessary as gases are dispersed into the soil.

NO NEED FOR VENT PIPE

In Sulabh Shauchalaya, vent pipe is not necessary (as in septic tank) as gases disperse into the soil. Vent pipe causes environmental pollution and spreads foul smell in the neighbouring houses where people raise objections. Visually also, it is offensive. In the congested urban areas, these pipes virtually transfer foul smell from one house to another. Hence, this is not suitable at all.

WHY TWO PITS

Single leach pits are appropriate only if they can be desludged

mechanically by a vacuum tanker, since their contents are not pathogen-free. In two-pit system, since one pit is used at a time, the filled up pit can be cleaned manually even by the householder himself because of the long period of digestion which makes it free of foul smell and safe for handling.

In a single pit system, desludging has to be done almost immediately after the pit has been filled to enable its refuse; this involves handling of fresh and indigested excreta which is health hazardous.

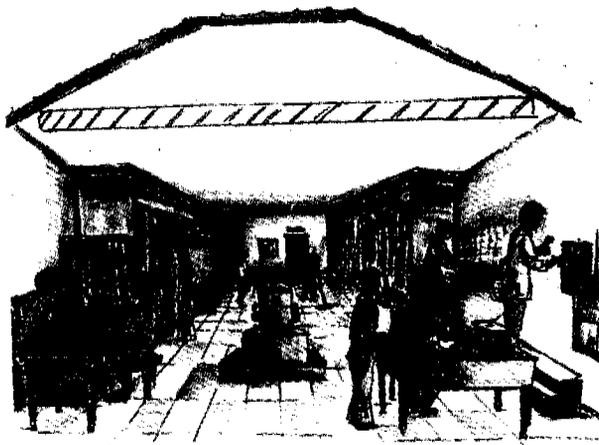
If a deeper and larger single pit is provided, desludging operation will be difficult and there would be more chances of pollution especially where ground water table is high.

FIXING OF PAN AND TRAP

Squatting pan of design specified for pourflush and trap with 20mm waterseal should be used in Sulabh Shauchalaya. The pan can be of ceramic, fibre glass, PVC, mosaic of cement and PVC pans, traps of the same material are used. For mosaic and cement concrete pans, traps are cement concrete. To ensure 20mm waterseal, the trap should be fixed keeping the top of inlet and top curvature of the trap horizontal and then fixing the pan over it, keeping its rim horizontal and flush with the floor.

SHAPE OF PITS

As far as possible, separate circular pits should be constructed as these are structurally more stable and the sludge is dry and safe to handle. Where separate circular pits of standard sizes cannot be constructed due to space constraint,



A Sulabh toilet sketch

pits of smaller diameter (not less than 750mm) be provided, but depth should be increased suitably to provide required storage volume and infiltration surface area. If it is not possible to construct small diameter pits, combined oval, square or rectangular pits divided into two equal compartments by a partition wall be provided. The partition wall should be taken 300mm below the bottom of pit and be plastered on both sides with cement mortar 1:6. The partition wall and pit lining in 300mm width adjoining the partition wall should not have holes. However, the possibility of water from one pit finding its way to the other pit is very much there. Therefore, the desludging of the filled up pit has to be done with care to avoid health hazards.

SPACING BETWEEN TWO PITS

The minimum space between the two pits should be one metre or equal to the depth of pits below the level of incoming pipe or drain, whichever is more. Where it is not possible to maintain this space, provide an impervious barrier like cut off screen or puddled wall between the two pits.

LINING OF PITS

The pits should be lined to avoid collapsing. Lining could be kin brick work, stones, laterite bricks, burnt clay or cement concrete rings. Lining could be done with treated bamboos, wooden logs, tar drums also but the life of such lining is limited.

50mm wide holes should be provided in alternate brick courses by laying bricks 50mm apart. Above the invert of incoming pipes or drains, no holes should be provided. Where the soil is sandy or sand envelope is provided or there are chances of damage by field rats, the width of holes be reduced to 12-15mm.

INTER-CONNECTION BETWEEN TRAP AND PITS

The trap should be connected to leach pits either through 'U' shape covered brick drains or 75mm dia AC or PVC non-pressure pipes. In case pipes are used, a junction chamber (250mm x 560mm internal size) should be constructed at the place from where the pipe is bifurcated to connect the two pits. The pipes or drains should have a minimum gradient of 1:15.

SIZE OF PITS

The sizes of pits where ground water table is always below the bottom of pit, and infiltration rate of soil is $30 \text{ l/m}^2/\text{day}$ and for 3 years sludge storage volume works out as follows:

| No. of Users | Circular Pits | | Combined Rectangular Pit divided by partition wall in two equal compartments. Size of each compartment | | |
|--------------|---------------|----------|---|------------|----------|
| | Diameter mm | Depth mm | Length mm | Breadth mm | Depth mm |
| 5 | 900 | 1000 | 850 | 850 | 900 |
| 10 | 1250 | 1000 | 1100 | 1100 | 1050 |
| 15 | 1400 | 1200 | 1400 | 1400 | 1200 |

The above depths are from the invert of incoming pipes or drains to bottom of pit. These depths are to be increased by 225mm to provide a free space above the invert of pipes/drains.

PITS IN HIGH SUBSOIL, WATER LOGGED AND FLOOD PRONE AREAS

In water logged, flood prone and high subsoil water areas, the pits should be raised so that the invert of pipe or drain is just above the likely water level. The raising of pits will necessitate raising of latrine floor also. Earth should be filled and well compacted all round the pit.

Prevention of pollution of drinking water sources, the pits in fine soils (effective size 0.2mm or less) should be located at a minimum distance of 3 metres from open wells and shallow hand pumps provided ground water table throughout the year is 2 metre or more below the bottom of pit; if water table is higher, the distance should be increased to 10 metres. In coarser soils (effective size more than 0.2m), the same safe distances can be maintained by providing 500mm thick sand envelope of 0.2mm sand all round the pit and sealing the pit bottom by some impervious material like puddled clay, polythene sheet, lean cement concrete or cement stabilised soil.

OPERATION AND MAINTENANCE

Operation and maintenance of *Sulabh Shauchalaya* is very easy and simple:

- Before use, wet the pan by pouring little quantity of water in it.
- After defecation, pour 1.5 to 2 litres of water in the pan for flushing.
- Pour about half litre of water in the pan after urination.
- Wash hands after defecation with ash or soap.
- The pan should be cleaned once a day with a brush or a broom and with soap powder periodically.
- One of the pits is to be used at a time by plugging the mouth of one of the drains or pipes.
- Kitchen, bathroom waste water or rain water should not be allowed to enter the pits.
- Other solid wastes like kitchen waste, rags, cotton, sweepings, etc. should not be thrown in the pan; this will block the latrine.
- To remove choking in the trap, do rodding from the pan and rear side by means of a split bamboo stick.
- When the pit in use is full, the flow should be diverted to second pit and the filled up pit should be desludged after 1.5 to 2 year rest period. The first pit can then be put to reuse, when second pit fills up.

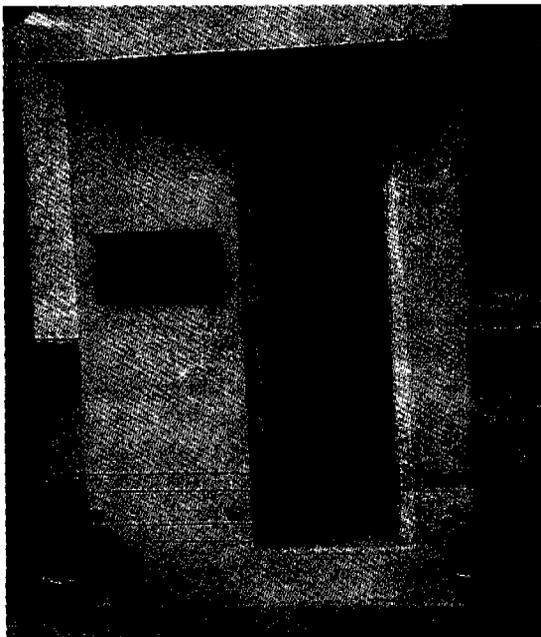


Besides technology, manure from digested sludge taken out from Sulabh toilet pits is widely used to grow crops and vegetables

IMPACT OF TWO-PIT TECHNOLOGY

The Sulabh technology has made enormous impact on the lives of the people, specially those living in slums. Or, those who have no toilet facilities and their number is enormous, maybe half the country's population. Or more. One

evidence of the impact is that the toilet facilities created by Sulabh are now being used by over 10 million (one crore) people everyday, all over the country. And, it is nowhere near the full coverage of the unsewered areas, specially in urban centres. The impact is still more on the minds of the people and decision-makers at the country and world levels, where the importance of low-cost sanitation technology is being realised. Sulabh's technology has been accepted as a "model" at



The modern toilet with English WC, based on Sulabh technology, is widely used in cities

the Habitat conference at Istanbul (June, 1996) and at many other national conferences. The lives of scavengers and the status of sanitation is higher today than at any time before, raising the hope that scavenging may end soon.

Sulabh has so far constructed and converted over 1,000,000 Sulabh household toilets and 3,000 public toilets, now being used by 10 million people every day, which is the total population of London that was the locus of the *Chadwick revolution*. Over 35,000 scavengers have been liberated from the cruel task of manual scavenging and 3,500 wards and family members of the liberated scavengers have been given vocational training and re-settled in other jobs. As many as 240 towns have been made scavenging-free. There has been a dramatic change in the physical environment of the towns where the Sulabh system is in operation. In the towns which have become scavenging-free, all dry (or bucket) household privies have been converted into the new two-pit pourflush Sulabh toilets. The houses which had no latrine too have been provided with sanitary toilets and for those who could not afford or space was a constraint, well-managed community

toilets have been provided. Thus, the dumping of fresh pathogenic night-soil had stopped, leading to the improvement in the physical environment. Sulabh's innovativeness is best demonstrated in the public toilet system operated on the *pay-and-use* basis which is self-sustaining. Along with public toilets, Sulabh provides bathing, washing and urinal facilities with separate compartments for men and women. Some other amenities, like cloakroom, public telephone, primary healthcare, drinking water, school for children in slums, etc., have also been provided at some places. The user-charge is nominal; the disabled, children and those who cannot pay are allowed to use the facilities free. The authorities, therefore, do not have to provide funds for the maintenance of public toilets for a period up to 30 years which is an unique example of community participation. In addition, these toilet blocks have provided dignity and safety by providing facilities for defecation and bathing in privacy, specially for women who are the greatest beneficiaries.

WIDE ACCEPTANCE

Hundreds of thousands *Sulabh Shauchalayas* have been constructed all over India in rural and urban areas so far. Sulabh alone has constructed nearly 10 lakh Shauchalayas in 585 towns in 18 states and one Union Territory. The people have accepted them and are fully satisfied with their performance. The Government of India, State Governments, and various national and international agencies have accepted the design and are advocating and providing financial assistance for construction of these Shauchalayas in India and in other developing countries in South-East Asia, Latin America, Africa etc.

The two-pit pourflush Sulabh technology is home-brewed (*swadeshi*), modern, cost-effective, repeatable in different climatic and geological conditions, culturally compatible, clean and users-friendly, besides being beautifully designed to merge with the best of buildings with as much felicity as with the huts in slums. Its users' range is across the whole spectrum of society - rich, not so rich, poor and not so poor. For that matter, Sulabh technology is at once revolutionary and futuristic - revolutionary because it is original and futuristic because it will take us into the next century, cleaner and healthier than before. ●

**One small step for me and a giant stride
for mankind. - Neil Armstrong who descended
on the moon on July 29, 1969.**

The technologies that Sulabh supersedes

Knowledge is built block by block over millions and millions of years by millions and millions of men and women, as a consequences of whose efforts we are healthier and happier today than before. Einstein conceived of atomic power ($E=MC^2$) in early 1920s which Oppenheimer (1904-67) honed up to finally explode the first atomic bomb in 1945 after which the world was never the same again. All great inventions, technologies and discoveries have evolved and developed over those which were at one time considered good enough to unravel the mystery of nature. Many assumptions, beliefs and scientific truths, once held as absolute, were toppled. Ptolemy (2nd century), like Aristotle, said in his *Ptolemic System* that the earth was fixed and the sun was moving, a theory that Copernicus toppled in 1543. Many Newtonian theories have come unstuck. But, it did not diminish his seminal role in the making of modern world. These scientists are respected no less than those who have repudiated them. The soldiers who fall in the battlefields are as much brave as those who survive. Between the man who invented the wheels and the one who exploded the bomb, men and women have been working to build knowledge by compiling information or discovering new ideas. Reformers, statesmen, writers, composers, inventors, thinkers, kings and killers - all have left their imprints on the sands of time.

The Sulabh technology also did not emerge from nowhere. It is a culmination of a series of technologies invented earlier during a search for knowledge. All previous sanitation technologies were good and effective in their own ways until Sulabh superseded them. And, all of those who developed those technologies were great visionaries. Let us know those great men and their good work which is the rich heritage of the Sulabh Sanitation Movement.

EXPERIMENTS IN WASTE DISPOSAL SYSTEMS

The Sulabh Sanitation Movement is essentially based on Sulabh technology which has been evolved after long experiments. Before

this movement was born, there has been a continuing search for the technology which could abolish scavenging. In earlier times also people made attempts to improve the sanitation system. And, the drainage system and WC (water closet) were evolved which have become symbols of modern civilization. The drainage system has a long story.

Romans, who inherited the Greek ideas on health and disease, established the best defence against filth and pollution. Apart from their many public baths and the water supply systems, the Romans built a gigantic sewer, *Cloaca Maxima*, in the sixth century BC, to drain away the filth of the Forum. It still functions as part of Rome's drainage system. In the AD 300s, there were 150 public toilets in Rome. Pure drinking water was carefully separated from the water intended for washing purposes. London has a complex drainage system built in the 1200s but nobody was allowed to let "offensive waste" pass through it until 1815. Although Parisians could boast of a sewerage system by the 1,400 still only one Paris house in 20 was linked to it by the late 1800s.

One of the great problems exercising the minds of the authorities who governed the medieval towns, was their very impregnability. They were virtually walled fortresses, making it difficult for unwanted people and material to get in. The town planners of the day made it equally difficult for things - including effluents of all kinds - to get out. Townsfolk and animals shared the land enclosed by the walls and towers, and littered the unpaved roads with filth and garbage. The cleanest places in those crowded places were the monasteries and markets. The monks built their settlements on well-thought out plans with efficient latrine system, ventilation and water supplies. As for markets, the medieval health authorities had a horror of rotting food, regarding it as a more likelier source of disease than the effluent. Any waste food and scraps that might decompose were hastily swept from the market area.

The water closet (WC), was invented in 1460, but the first person, as stated earlier, to do anything really practical with the idea seems to have been an Elizabethan courtier, Sir John Harrington. Banished from court for a while by his outraged monarch for translating and circulating among the ladies a racy story by the Italian poet Ariosto, Sir Harrington retired to his home near Bath. Besides translating some more of Ariosto, Sir Harrington worked there on a design for a flush WC and fully installed the contrivance in his own home. Having won his way

back into Elizabeth's good books, Sir Harrington fitted a royal flush WC into the queen's palace at Richmond, Surrey. Unfortunately, he wrote a book about his device, called *The Metamorphosis of Aiaz* - the title is a pun on the old name *jakes* for a privy. The book appeared in 1596, and its earthy humour led the incensed Queen to banish Harrington from the court once again. (See Introduction)

FIRST MAN TO SET UP WC

As stated earlier, an improved model of Harrington's WC, incorporating a stink trap, was patented by a London watchmaker, *Alexander Cumming* in 1775. Further improvements were made by a London cabinet-maker and inventor, *Joseph Bramah*, in 1778. These early WCs were connected straight to cesspits and, even after the invention of stink traps, the smell from them must have been powerful. Not until the invention of the modern sewerage system in Hamburg in the 1840s with arrangements for flushing the pipes regularly into river water, did the health of people sizably improve. The finest of the 19th-century sanitary engineers was *Sir Joseph Bazalgette* who, in the 1850s, equipped London with an efficient system of sewers for which he invented automatic flood doors and new pipe sections that allowed a speedier flow of effluent. The chamber pot, from humble beginnings, offered scope for improvement. In Victorian times, it became a veritable object of art, and even in the 1900s appeared to inventors as a vessel that might be elaborated. In 1929, an American electrician, *Elbert Stallworth*, patented the first electric chamber pot for use in chilly nights. In a rubber and asbestos seat which ran round the upper edge were embedded metal bands enclosing resistance wire between the mica strips.

As late as 1966, many inventors were still taking their thoughts to WC. In that year, a Chicago hairdresser took out a patent for a novel toilet seat which embodied a buttock-stimulator for relieving constipation and for general massage. An electric motor set the two separated halves of the seat moving backwards and forward alternately. Both halves could also vibrate together at high speed. In spite of great progress made in the field of urban sanitation in advance countries, these facilities did not cross their boundaries. In the poor countries, these facilities were simply did not exist. And, the system of excreta disposal remained primitive and unhygienic.

EXCRETA DISPOSAL SYSTEMS TRIED IN INDIA

In early days, there was no such problem. The people used open space, river banks and outskirts of habitats for open defecation. The night-soil, thus, deposited on the surface of the earth converted itself into soil and there was, thus, no need for the disposal of human excreta. But with the concentration of large population in cities, the traditional system broke down and people wanted to have enclosed places inside their houses for defecation. With this, the problem of disposal of human excreta came up. The people developed and adopted different systems of disposing of night-soil and different systems were developed in different parts of the country. Climatic conditions, types of soil, water resources, economic conditions, social and cultural preferences mattered in adopting a particular type of latrine system in a society or country. With the development of modern technology, the toilet designs were modified and improved. At present, different types of toilets are operating in different places. The most commonly known and prevalent toilet systems in India as well as in other parts of the world are sewerage, septic tanks and the two-pit systems of Sulabh Shauchalaya along with the traditional latrine system. But in addition to these types, some other types of toilet systems had also been developed at different places.

TRENCH LATRINE

After coming from South Africa to India, Mahatma Gandhi was concerned about the sub-human practice of scavenging. Whenever a meeting of the All-India Congress Committee was organised, it was an instruction by Mahatma Gandhi that the disposal of night-soil would be done only by Congress volunteers and not by scavengers. In this attempt, a trench latrine was first constructed at *Sevagram*, Wardha Ashram. Trench latrine consisted of a shallow pit, 2' to 3' deep and 3' to 4' wide, either circular, rectangular or square, a wooden plank having a hole in the middle and covered from three sides either by a tin or thatched. In a trench latrines, the users have to put earth or grass leaves after defecation. The site of the trench latrine has to be changed after every six months when it is full. Trench latrine, although better than open defecation, could not, however, serve the purpose. It was very difficult to change its place every six months. Moreover, nor could it prevent

fly-breeding and bad odour. Sometimes, bacteria produced in the night-soil used to float on the surface of the latrine. Therefore, this system could not be adopted by the people.

BORE-HOLE LATRINE

Bore-hole latrine was developed under the joint collaboration of the All India Institute of Health and Hygiene, Calcutta, and the Rockefeller Foundation in pre-Independence days. First, it was installed in Singure, West Bengal. It consisted of a circular hole, usually 40 cm. in diameter, bored vertically into the ground by means of an earth auger to a depth of 6-8 metres. The latrine floor and its superstructure were also provided. This was used in African countries, West Asia, South East Asia, Western Pacific and South America. The greatest difficulty in a bore-hole latrine was the collapse or caving-in of the pit-walls, which was most likely to happen in alluvial soils. It required special equipment for construction and the chance of water pollution was also very high. Fly-breeding is another serious problem in this type of latrine. Due to these reasons, the bore-hole latrine could not be acceptable on a mass scale.

DUG-WELL LATRINE

The dug-well latrine was first introduced in West Bengal in 1949-50. It was about 30" in diameter and 10' to 30' deep in hard soil. The well was lined to prevent caving in of the soil and was brimmed with concrete around its entry point. The squatting plate was placed over the pit for defecation with a superstructure for the privacy of the user. The dug-well latrine is fairly expensive and difficult to construct at places where the water table is high. The function of a dug-well is the same as that of bore-hole. If it penetrates ground water, it carries with it the risk of contamination. Because of these limitations, the dug-well latrine cannot be used in most parts of the country.

ULTA MATKA PRIVY

A large earthenware pot (*matka*) is buried upside down in a pit, at least 0.75 metres below the ground-level to act as linings. The *matka* is about 1.5 metre high; a hole is made to fix a pipe, joining

the WC for discharging the waste. A layer of horse-dung is laid at the bottom in the beginning to accelerate the process of decomposition. Salt water is also flushed once a week to help liquidation of the faecal matter. The maximum leaching takes place from the open end at the bottom and a little from the porous side of the *matka*. The gases produced in the pit are absorbed by the soil. When the *matka* gets filled up, it is kept closed for about two years and the digested material can be used as fertilizer. During this period, another *matka* has to be provided. Although the *matka* privy has been tried in rural areas of Kheda, Gujarat, it has not gained popular acceptance on account of its very temporary nature.

GOPURI SYSTEM

Gopuri is a form of compost latrine provided with two tanks which are constructed over the ground level. Instead of being dug in the ground, a movable seat with pan is fixed on the tank in use. The filled-up tank is covered with dry earth, ashes, leaves and domestic waste materials. Gopuri latrine has a permeable bottom and like other compost latrines, the night-soil is transformed into compost after a period of time. It has a vent-pipe which keeps it reasonably odourless. In this system, fly-breeding can be a problem. The main disadvantage, however, is the location of its receptacles above the ground level which makes it unsuitable for most households in this country.

SOPA SANDAS LATRINE

It is a type of compost latrine which was first introduced in Maharashtra. It consists of (1) RCC or stone slab with cement or mosaic WC pan; (2) steep sloping pipe with a tin flap at the upper end; (3) rectangular pit of 4' x 3' x 3' divided into two parts with partial honey-comb brick lining; (4) Y-pipe to connect both pits and (5) a vent pipe to carry away bad odour from the pit. It has been found that the tin flap prevents bad odour from entering the toilet and also prevents the flies, etc. The flap, however, wears out during use and has to be replaced from time to time. The pit is covered with a sheet of tin when full and eventually the human excreta is transformed into compost. It is shovelled out from the pit after a time and spread in the field to augment the fertility of the soil.

HAGEBU LATRINE

This is also a modified form of pit latrine which is dug up to 3 feet in the first instance with a diameter of 1' 9". The diameter is gradually increased to 4 feet at the base while the depth is extended up to 16' or 17'. A latrine seat is placed over the pit and a suitable superstructure is built. This type of latrine was introduced by the Health Department of the former State of Mysore and is still found in operation in some parts of that area. Here also space is a problem as once the pit is filled, another fresh pit hole has to be dug nearby. The question of its popularity, therefore, did not arise.

BARAPALLI TYPE LATRINE

For the environmental improvement of villages, a pit latrine was developed by Dr. Edwin Abbot in the Barapalli village of Orissa. This type of latrine is 3' to 5' deep with a diameter of 30". About 200 sq.ft. of land is needed for installation of this latrine. A container of tin or an earthen vessel is provided to store water for flushing and also for washing after defecation. A broom is also provided for cleaning the pan.

PRAI TYPES LATRINE

After a number of trials and considerable intensive research spread over a long period, the Planning and Research Action Institute (PRAI), Lucknow, has designed a hand-flush water-seal latrine with a pan and a trap. Two types were developed: a direct type in which the latrine is placed over the pit and the other type in which the latrine is away from the pit and connected with a pipe. One or two jugs of water is usually sufficient to flush the faeces into the pit. When the pit is filled with solid waste, the second pit is made by the side of it, which is connected to the latrine. The content of the first pit may be used as manure after a time. The one-pit system is not very successful as the second pit cannot be constructed immediately after the first gets filled up. Secondly, the cost of the second pit would go up with the passage of time.

VENTILATED IMPROVED PIT (VIP)

This is based on an improved design of the pit latrine developed

in Rhodesia. Aerobic action takes place in the pit through a cycle provided by air-suction through the toilet seat and up the vent pipe which is warmed by the sun and, thereby, draws up the air. It is claimed that the bad odour emanating from the pit is expelled through the vent pipe. As flies cannot enter the pit through the flue pipe, chances of fly-breeding in the pit is reduced. Other deficiencies, however, continue to exist. The latrine cannot be constructed at places where the groundwater table is high. When the pit gets filled, a new latrine has to be constructed. However, the VIP latrine is a considerable improvement over the traditional pit latrine.

VENTILATED IMPROVED DOUBLE PIT LATRINE (VIDP)

The VIDP latrine differs from the VIP in only one respect, viz. that it has two alternate pits. When one is filled up, it should rest at least for one year before it is emptied to ensure pathogen destruction. The operation and maintenance of the VIDP is the same as that of the VIP. Two pits are provided by constructing a separate wall in the VIP pit or by constructing two separate pits. Thus, the necessity of constructing another latrine, once the pit is full, is precluded. As the VIP and VIDP latrines are designed for use without water; they require good maintenance which consists principally of keeping the squatting plate and superstructure clean. Otherwise, there is the risk of fly and other nuisance.

ROEC (RED ODOURLESS EARTH CLOSET)

An alternate design for a VIP latrine is the ROEC. In this latrine the pit is offset and the excrement is introduced into the pit via a chute. A vent pipe is provided as in the VIP latrine. A serious disadvantage of the ROEC, however, is that the chute is easily fouled with the excrement and this may provide a site for fly breeding. The chute is, therefore, to be cleaned regularly with a long handled brush.

RCA LATRINE

An appropriate design of latrine for rural areas has been designed under the RCA project. Considerable work in this direction was done particularly by the Poonamalle Centre, near Madras. A

composite design was prepared which includes good features of earlier designs. The essential parts of this design are: (1) a slab or squatting plate, 3' square and 2' thick. The thickness towards the pan declines up to 1.5" paving the way for water to flow down the slope; (2) a pan, 17" in length, 8" in width, at the rear and 5" at the front. The depth of the pan at the front portion is 3". It slopes down to the rear. A trap with 3" diameter is joined with the pan and its other end is connected with the tank. The recommended depth of water-seal is 3/4"; (3) a tank of pit of 30" diameter of 30" square with a depth of 6' to 9' and (4) a superstructure above the pan and seat. When the first pit is filled, a second one is made nearby and is connected with the latrine. When the second pit is filled, the first is emptied and re-used.

CHEMICAL TOILET

The chemical closet consists of a metal tank containing a solution of caustic soda. A seat with cover is placed over the tank which is ventilated by a flue rising through the house roof. The excreta deposited in the tank is liquid and sterilized by the chemical which also destroys all pathogens. After several months of operation, the spent chemical and liquified matter are drained or removed. This system is quite satisfactory, safe and hygienic. But the cost of construction and maintenance of chemical toilet is prohibitive which is why this system could remained popular only with a very limited size of the population. This system cannot, therefore, be recommended for large-scale adoption.

AQUA PRIVY

The aqua privy consists of a tank filled with water into which plunges a drop pipe hanging from the latrine floor. The excreta and urine fall through the drop pipe into the tank where they undergo anaerobic decomposition as in a septic tank. The digested sludge, which is reduced to about a quarter of the volume of the deposited excreta, accumulates in the tank and has to be removed at intervals. In aqua privy, there is no provision of soak-pit for the discharge of the effluent. This, therefore, is not hygienic. Secondly, whenever the level of water goes down below the drop pipe, the smell comes out of the tank and the entire surrounding is filled with stink. This system could not, therefore, be adopted on a large scale.

VIETNAM TOILET (DOUBLE VAULT LATRINES)

The double vault latrine consists of two receptacles, each with a volume of 300 litres. The receptacles are covered with a squatting slab which has two holes, foot-rests and a channel for urine. Faeces are deposited in one of the receptacles which can be used for about 3 to 6 months by a household of 5-10 persons. Urine is drained away and collected in a jar behind the latrine. The input into the receptacles is, thus, only faeces, ashes and toilet paper. The contents are fairly dry and the decomposition process is basically anaerobic. When the first container is two-thirds full, it is filled with dried powdered earth, ash or paper and then sealed. The other one is used in its place. When the second vault is nearly full, the first one is opened and emptied. The decomposed excrement, now odourless, provides a good fertilizer. This toilet is known as *Vietnam Toilet* also because this system has been used in Vietnam on a large scale. The Vietnamese health authorities claim that after 45 days in a sealed container, all bacteria and pathogens get killed. From the point of view of health, this system should be acceptable, but it cannot be recommended in this country where water is used after ablution. Moreover, it is built entirely above the ground with the two receptacles placed on a solid floor of concrete. The latrine cannot be constructed inside the house and has to be located far away from it. Hence, this type of latrine is not suitable for use on a mass scale in India.

These technologies were in use at various times and places. And, in spite of imperfections, and they were many, they provided bottomlines to find new ways to dispose of faeces. As a matter of fact, the toilet systems grew with civilisations which influenced the environment that largely determines the level of economic productivity, health and lifestyle. And, that is what all technologies sought to promote, including these. ●

**Most conflicts in next century
will be over water. - UNDP**

No groundwater pollution from Sulabh toilets

Adequate supply of safe water and sanitation are vital for sustainable development and to improve the quality of life no less than alleviating poverty. Studies carried out in India and abroad indicate that human excreta is the cause of many enteric diseases such as cholera, dysentery, typhoid, paratyphoid, infectious hepatitis, hookworm, diarrhoea, etc. Over 50 infections can be transferred from a diseased person to a healthy one by various direct or indirect routes from human excreta and it causes nearly 80 per cent sickness. Therefore, appropriate human waste management should be the primary objective of improved sanitation to build a healthy nation and provide a cleaner environment.

The severity of the problem could be judged from the fact that hardly 20 per cent of the urban population has access to flush arrangements connected to sewerage system, 14 per cent have water-based toilets connected to septic tanks, 33 per cent have bucket latrines and the remaining 33 per cent do not have access to any latrine facility. The coverage in rural areas is only 3 per cent. Nearly 89 per cent of the population in India (about 750 million people) either defecate in the open or use bucket/dry privies or use community toilets. Number of bucket privies has been estimated at 7.6 million, of which 5.4 million are in urban areas. The daunting problem of sanitation accompany another serious social problem, that is the problem of manual scavenging which is done by 4,00,000 scavengers belonging to the lowest caste who suffer from inhuman and degrading discrimination because of their profession of physically cleaning and carrying human excreta.

In developed countries, the standard solution for safe disposal of human waste is the water-borne sewerage. Due to severe financial constraints and very high capital as well as operational and maintenance cost, sewerage is not the answer

to solve the problem of human waste disposal in developing countries. Septic tanks too, besides high cost, have many drawbacks and operational problems. In addition, these systems require sufficient quantity of water which is a scarce commodity. With the present economic condition, sanitation facilities cannot be provided to all in the foreseeable future, if we continue with the sewerage system. Therefore, the most appropriate technological option has to be adopted which provides the socio-culturally and environmentally acceptable level of service at economic cost.



Long trek for scarce water

POLLUTION-FREE SULABH TOILET

Sulabh Shauchalaya, developed by Dr. Bindeshwar Pathak, Founder, Sulabh Sanitation Movement, is, as stated as, the most appropriate technological option to serve as an alternative to bucket privies and to stop open air defecation. It is an indigenous technology and the toilet can easily be constructed by local labour and materials. It provides all the health benefits by safe on-site disposal of human excreta, which sewerage provides. It requires only 2 litres of water for flushing, thus conserves water. However, if desired it can be cistern flushed also. It has a high potential of upgradation, can be easily connected to sewers when introduced in the area. It does not need the services of scavengers to clean the pits.

When the programme of conversion of bucket privies into Sulabh Shauchalayas, launched by Dr. Pathak in early 1970s moved apace, people raised doubts about the appropriateness of the technology due to pits likely to cause soil and groundwater pollution. When the issue was referred to the Director, National Environmental Engineering Research Institute, Nagpur, he informed that studies had demonstrated that the extent of pollution flow arising out of the pit privies is very limited and the system can be adopted in most soil conditions with certain precautions. The apprehension of groundwater pollution is a

deterrent factor with many for adoption of Sulabh Shauchalaya for improving the environment and health of the community. The pollution problem has been studied in great detail, both in India and abroad. Studies have also been done by Sulabh near Calcutta with radio isotope tracers in collaboration with All India Institute of Hygiene and Public Health, Calcutta and Bhabha Atomic Research Centre, Bombay. Various studies have proved conclusively that with due precautions, Sulabh Shauchalaya can be safely constructed in almost all geological and hydrogeological conditions.

GENERAL INFERENCES

Soil (unconsolidated) provides a very effective natural treatment system, having the ability to remove faecal micro-organisms and to break down or attenuate many chemical compounds. The unsaturated zone above the permanent water table affords the most important line of defence against the pollution of underlying aquifers. The nature of materials and thickness of this zone are the key factors in determining pollution risk. The key factor in reducing micro-biological pollution of groundwater is the maximisation of effluent detention time. The risk of groundwater pollution will be minimal where more than 2 metres of fine unsaturated soils are present beneath the latrine pits, provided the hydraulic loading does not exceed 50 mm/day. In saturated zone, pollutants move with the groundwater causing a pollution plume to develop from the pollution source. Microbiological pollutants are not normally found beyond the distance travelled by groundwater in around 10 days.

STUDIES AND INVESTIGATIONS

- 1 The studies conducted by Klinger in 1921 concluded that pit latrines, if properly constructed, are unlikely to cause bacterial intestinal infections. There is minimal pollution risk in sandy or clay soil provided the groundwater level did not rise higher than 3-4 metres below ground, i.e. 1.5-2.5 metres beneath the pit bottom.
2. E.L. Caldwell and L.W. Parr conducted studies on pollution travel from a variety of pit latrines during 1930s in the USA.

The conclusions of those studies are summarised below:

- Clogging process was an important defence mechanisms limiting the extent of bacterial penetration. After the on-set of clogging in the soil, the diffusion of organisms was inhibited. After some time bacterial pollution was limited practically to the latrine. However, chemical contamination of the groundwater still occurred, although this was somewhat diminished.
- Groundwater contamination was reduced by providing fine sand (0.1-0.25 mm) envelope around the pit. No faecal coliforms were detected in any of the observation wells 3 metres away.
- In a pit latrine penetrating the water table in a medium fine sand (effective size 0.5-1.0 mm) with groundwater velocity of 0.5 m/day, faecal coliform initially penetrated 3 metres in 3-4 months before the flow from the pit was restricted by clogging.

3. The investigations on risk of pollution of water supplies from pit latrines were carried out by Dr. Dyers and Dr. Bhaskaran of All India Institute of Hygiene and Public Health, Calcutta in Singur (West Bengal) during 1943-45. These studies showed that in medium soil made up of sand 0.2 mm effective size and with a groundwater velocity 0.7-0.8 m (2.5-3.0 ft)/day, bacterial pollution did not flow more than 3 m (10 feet) distance from the latrine. Organic pollution indicated by 5 day BOD flowed to a distance of 1.60 m (5 feet) in a manner similar to bacterial pollution. Chemical pollution flowed further than bacterial pollution and was traced upto 5 m (15 feet) distance before becoming too dilute to be distinguishable



Exchanging ideas and opinions has been Dr. Pathak's practice since early days

in the groundwater. It was also observed that pollution takes place only during the first few months after commissioning of the latrine. When the latrine has been used for some time, the interstices in the soil get clogged and regression of pollution takes place due to effective filtration and bacterial die off.

4. The Report (1949) of the Environmental Hygiene Committee (Government of India), while discussing hygiene of the rural environment, mentioned: "We wish here to state that the risk of pollution of groundwater by borehole and other types of latrines has been somewhat exaggerated under conditions of use in villages, in sandy soil, warry soil or clayey soil, the risk does not extend beyond 25 feet. A radius of 25 feet gives a factor of safety."
5. Subrahmanyam and Dr. Bhaskaran (1950) reviewed the studies carried out in India and the USA and concluded that:
 - It appears that bacterial travel mainly depends on the velocity of groundwater flow.
 - The penetration of bacteria into the saturated zone is the distance covered by the groundwater in 4-7 days, which is the probable survival time for coliform organisms in the anaerobic groundwater environment.
 - The spread of pollution is reduced when a gelatinous membrane is formed on soil particles, as it acts as a physical barrier to bacteria penetration. In this condition the soil becomes a real biological filter comparable to a slow sand filter in water leaching.
 - The safe distance between a borehole latrine or leaching cesspit and a well may be taken to be the distance represented by about 8 days travel of the groundwater.
 - In the study areas in India where the hydraulic gradient is less than 0.01 and the soil is sandy (effective size less than 0.25 mm), the groundwater velocity is unlikely to exceed 0.9 m/day, and a horizontal distance of 7.5 m will provide an ample margin of safety against bacterial pollution.
6. While reviewing the available information on the soil and ground-water pollution arising from the on-site human

excreta disposal systems, WHO publication *Excreta Disposal for Rural Areas and Small Communities* by E.G. Wagner and J.N. Lanoix 1958 mentions that after excreta is deposited on the ground or in pits, the bacteria, unable to move much by themselves, may be transported horizontally and downward into ground by leaching liquids or urine, or by rain water. The travel distance of bacteria varies with several factors, the most important of which is the porosity of the soil. Their horizontal travel through soil is usually less than 90 cm (3ft.)



Most wars in the next century will be over water

and the downward travel less than 3 m (10 ft.) in pits open to heavy rains, and not more than 60 cm (2 ft.) normally in porous soils. Many factors such as slope and level of groundwater and soil permeability affect bacteria removal in groundwater. As a matter of safety, it was suggested to locate the privy or cesspool downhill, or at least on some level piece of land, and to avoid, if possible, placing it directly uphill from a well. Where uphill locations cannot be avoided, a distance of 15 m (50 ft.) will prevent bacterial pollution of the well. The publication has further mentioned that:

- In sandy soil a privy may be located as close as 7.50m (25 feet) from a properly constructed household well, if it is impossible to place it at a greater distance. In the

case of a higher-yielding well not less than 15m (50 ft.) should separate the well from a latrine.

- In homogeneous soils the chance of ground-water pollution is virtually nil, if the pit bottom of the latrine pit is more than 1.50m (5 ft.) above the groundwater table. The same may be said if the bottom of a cesspool is more than 3 m (10 ft.) above the ground.
 - While constructing pits in areas containing fissured rocks or limestone formations, construction must be carried out after careful investigations, since pollution might be carried directly through solution channels and without natural filtration to distant wells and other sources of drinking water supplies.
7. The Indian Council of Medical Research (ICMR) carried out a review on the work done on rural latrines in India during 1966 and observed that:
- The extent of pollution from the pit latrines in clay soil is very limited.
 - In soils, as in the Singur (West Bengal) experimental area made up of sand 0.2 mm effective size and 3 ft./day velocity of groundwater flow, bacterial pollution did not travel beyond 10 ft. from the latrine.
 - Pollution flow from latrine pits takes place only during the first few months. When the latrine has been in use for sometime, the interfaces of the soil get filled up, resulting regression of pollution.

INTERNATIONAL AND NATIONAL EFFORTS

1. The National Seminar on Conversion of Bucket Privies into Pour-Flush Waterseal Latrines organised by the Government of India, WHO and UNICEF at Patna in May, 1978 concluded that the extent of pollution flow arising out of the pit privies is very limited. On-site sanitation systems could be adopted in most soil conditions provided certain precautions are taken in locating the pits.
2. International Reference Centre for Waste Disposal (IRCWD), WHO and UNDP/World Bank Project on Low Cost Sanitation brought out a report (IRCWD Report No. 0/82) after reviewing the available literature on the risk of groundwater pollution by on-site sanitation. Besides

reiterating the important conclusions, the report suggested following measures for restricting microbial groundwater pollution:

- minimising latrine hydraulic loading by increasing the soakway area and excluding additions of any household waste water,
 - maximising the thickness of the unsaturated zone available for purification by constructing raised latrine, and
 - including longer saturated flow time by deepening (with grouting) of water supply borehole solid lining tubes, wherever feasible.
3. The Technology Advisory Group (TAG-India) of the UNDP/World Bank Project on Low-Cost Water Supply and Sanitation carried out studies on likely pollution risk of groundwater sources from on-site sanitation systems in 1980-81. The TAG in the Master Plan and Feasibility Report on Low-Cost Sanitation provided guidelines for the implementation of on-site sanitation programme with minimum risk of pollution of groundwater and water supply distribution system. Based upon the studies carried out in India, the USA and elsewhere, the TAG reiterated that in alluvial soil (with predominance of soil mixed with clay and fine sand) where the pits are located in the unsaturated zone, the risk of bacterial pollution is minimal provided the pit bottom is at least 2 m above the maximum ground level and the hydraulic loading in the pits does not exceed 50 mm/day; where the pit extends in the saturated zone, the pollution travel depends mainly on the velocity of groundwater. In alluvial soil, the distance of pollution travel is equivalent to about 10 days travel of groundwater. With the continued usage of the pit, clogging of soil around the pit takes place resulting in regression of pollution plume which ultimately stabilizes at about 1 m distance. It was also reported that very little field work had so far been done regarding travel of viral pollution of groundwater. However, it was indicated that viral pollution is reduced, if adequate interposing soil layer exists and hydraulic loading is limited to 50 mm/day.
 4. *Manual on the Design, Construction and Maintenance of Pour-Flush Water Seal Latrines in India (1984)* (TAG Technical Note No. 10) brought out by UNDP/World Bank Project has given

guidelines and prescribed safe distances for locating leach pits in various geological and hydrogeological situations to minimise possible risk of pollution of groundwater and distribution mains for siting leach pits.

5. The Committee of Experts constituted by the Government of India, UNICEF/UNDP Project on Rural Sanitation with the World Bank as executing agency, after reviewing the research and studies carried out by various institutions and organisations like AIH&PH, IRCWD, UNDP-World Bank in India and abroad, in the field of on-site sanitation, formulated design criteria for pour-flush water-seal latrines for the rural communities in India. The design criteria, which included details of pollution aspects, suggested guidelines for locating leach pits and prescribed precautions to check pollution of drinking water sources and water supply mains.

**6. The Indian Standard Code of Practice:
Bureau of Indian Standards**

Indian Code of Practice for Sanitation with Leaching Pits for Rural Communities (IS: 12314-1987) has prescribed safe distances and precautions to be taken in various geological and hydrogeological situations to guard against risk of pollution of drinking water sources and water supply mains from on-site sanitation. These are:

- (A) Safe distance from drinking water sources
 - i) In unsaturated soil conditions, that is, where the distance between the bottom of the pit and the maximum ground-water level throughout the year is 2m and more:
 - a) The pits can be located at a minimum distance of 3m from the drinking water sources such as tubewells and dugwells, if the effective size (ES) of the soil is 0.2mm or less; and
 - b) For coarser soils (with ES more than 0.2 mm), the same distance can be maintained if the pit is sealed off by an impervious material, such as puddle clay or plastic sheet, and a 500 mm thick envelope of fine sand of 0.2 mm effective size is provided all round the pit.
 - ii) In wet pit or saturated soil conditions, that is, where the distance between the bottom of the pit and the maximum ground-water level during any part of the year is less than 2 m:

- a) The pits can be located at a minimum distance of 10 m from the drinking water sources, such as tubewells and dugwells if the ES of the soil is 0.2 mm or less; and
 - b) For coarser soils (with ES more than 0.2mm), minimum distance of 10 m should be maintained if the pit is sealed off by an impervious material, such as puddle clay or plastic sheet, and a 500 mm thick envelope of fine sand of 0.2 mm effective size is provided all around the pit.
- iii) In both the above cases (i) (b) and (ii) (b):
- a) The sand envelope should be taken at least up to two metre above the highest maximum water level to see that no water stagnates on top of the sand filling.
 - b) Where the bottom of the pit is submerged below the maximum ground-water level:
 - i) The top of the pits should be raised above the ground level, if necessary, so that the inlet pipe into the pit is at least 0.75m above the maximum groundwater level;
 - ii) The sand envelope is taken upto 0.3 m above the top of the inlet and confined suitably to exclude any surface drainage including rain water directly entering the sand envelope;
 - iii) In mound type latrines, one metre high earth filling should be provided for at least 0.25 metre beyond the sand envelope to drain away surface water; and
 - iv) The honey-comb brick lining in the pit should be substituted should have cement mortar.

(B) Safe distance from water supply mains:

Lateral distance between the leaching pit and the water main should be at least 3m provided the water table does not rise during any part of the year above the pit bottom and the inlet or pipe or drain to the leach pit is below the level of water main. If the water table rises above the bottom of the pit, the safe lateral distance should be kept as 8m. If this cannot be achieved, the pipes should be completely encased to a length of at least 3m on either side of the pit.

When the pits are located either under the foot-path or under the road, or the water supply main is within a distance of three metre from the pits, the invert of the

inlet should be kept at least one metre below the existing water mains. This would ensure that the liquid level in the pits does not reach the level of the water main. The water pipe should not cut across the pit but where this is unavoidable, the water pipe should be completely encased for a length of 3 m on either side of pit including the portion across the pit to prevent infiltration or exfiltration. No joint of water main should be permitted in the pit.

TECHNICAL GUIDELINES

The Ministry of Urban Development, Government of India and Regional Water and Sanitation Group -- South Asia -- UNDP/ World Bank Water and Sanitation programme brought out *Technical Guidelines on Twin-Pit Pour-Flush Latrines* in 1992. These guidelines have been prepared in a very systematic and objective manner for ready reference by field staff on design, construction and maintenance of pour flush latrines under the massive programme of liberation of scavengers launched by the Government of India. The guidelines prescribed there in for pollution safeguards are the same as given in the Manual (TAG Technical Note No. 10), and as suggested by the Committee of Experts constituted to frame design criteria for rural sanitation and the Indian Standard Code of Practice. These indicate that the Sulabh technology prevents groundwater pollution. ●

From the errors of others,
a wise man corrects his own.
- Publilius Syrus

Case studies in small towns

A technology which has survived and served the people for long years is not without advantages. And, the one to replace it may have many faults. Sulabh scientists have made location specific studies of the sanitation. A situation report.

The physical features that affect the suitability of the septic tanks are restricted space for drainage fields and high-water service levels. Another main disadvantage is a reasonably high degree of users' attention, as the septic tanks have to be inspected periodically to ensure that neither scum particulates nor suspended solids are flushed with the effluent. Septic tanks and leaching fields are among the most expensive forms of households water disposal. Capital, operation and maintenance costs exceed even the cost of conventional sewers and sewage treatment.

The main advantage of the septic system is its flexibility and adaptability to a wide variety of individual households water disposal requirements. They may be suitable for effluent disposal. But the cost of septic tank installation, as well as its periodical desludging make it unaffordable for the poor. The excessive area required for infiltration field also limits its application to urban areas.

The septic latrine system is also expensive if the entire process and the maintenance and cleaning of the septic tank are taken into account. Moreover, the cleaning of the septic tank means the disposal of night-soil deposited in the tank for a long period. It is obvious that this operation involves carrying the night-soil from the tanks to some other places and, consequently, scavengers are needed for cleaning and carrying of human excreta. The operation is also costly and scavenging is not abolished because the need for their services remains. Hence, from the point of view of liberation of scavengers as well as cost, the septic tank system is not an acceptable alternative to be adopted on a mass scale. As regards the sewerage system, it has the merit of liberating scavengers

because scavenging is not involved in it. This system has been partially adopted in some towns. The high cost involved in the sewerage system does not permit the Government to cover all towns. Hence, the system is not successfully operating in the country.

In Bihar, like the other States, the sewerage system has not been found successful by and large and even today more than two lakh service latrines exist in the State. In order to present a comprehensive picture of the status of the existing sewerage system in Bihar, a town-wise study was conducted by Sulabh. For this purpose, a questionnaire was prepared and filled up by competent authorities in five Bihar towns, namely Patna, Jamshedpur, Ranchi, Bokaro Steel City and Barauni.

In all, eight sewerage plants were investigated - two each in Jamshedpur, Ranchi and Barauni - and one each in Patna and Bokaro Steel City. The sewerage system was first introduced in the central east part of Patna during 1936-39. The sewers laid by the Public Health Engineering Department led to Saidpur where 4 sewage treatment plants of 04 mgd. capacity were also constructed and commissioned in 1937. Subsequently, the sewerage system was extended to the neighbouring areas and the treatment plant was also augmented from time to time and completed in two phases - phase I in 1946 and phase II in 1972 at Saidpur. Both the old and new treatment plants employed the activated sludge process. The present capacity of this integrated plant is 6.2 mgd., which is serving a population of about one lakh. The cost of the plant was about Rs. 1.2 crore.

A small sewage treatment plant employing the biofilterate process was installed in 1951 at Beur. This was designed to treat the septic tank effluents from the whole of old eastern Patna, mainly the Gardani Bagh



Out of 4,800 city centres, only about 300 are sewerred. And, that too partially

area. However, it became ineffective very soon due to poor maintenance. With the increase in population and the resultant increase in sewage generation, the plant could not sustain the excess load beyond its capacity. As such, the surrounding area was water-logged with the untreated effluent. To ward off public health hazards and to restore environmental sanitation, a new treatment plant was installed again at Beur in 1968-70. The treated effluent was supposed to be discharged into the serpentine nullah and, ultimately, into the Ganges.

On the whole, the existing state of Patna sewerage system is extremely unsatisfactory. Hardly 11.5 per cent of the population of the city (1,00,000 out of 8,70,940) is served by the sewer network. The sewage is discharged into the river either by direct pumping or through open channels, nullah and road-side drains, exposing people to health hazards. The level of treatment to ensure the maintenance of chemical and bacteriological standards of the treated effluent is inadequate because of the poor operation of the plant. The maintenance of sewer-lines is far from satisfactory. Due to absence of pumping stations at certain points, some drains do not function properly. In sum, the whole system is in disarray. A total amount of only Rs. 1.0 only is being spent by the Corporation annually on the maintenance of conveyance, collection and treatment of sewage which comes to Re. 1 per capita.

JAMSHEDPUR

In the plateau region, Jamshedpur has two domestic or industrial sewerage systems with secondary treatment for a part of the town. Out of 7,16,450 people only 1,29,000 (18 per cent) have been provided with this facility. The first plant at Jamshedpur was installed in TISCO township in 1944 to serve a population of 94,000 at a cost of Rs. 5 crore at the then prevailing price index. The system was designed to treat 4 mgd. of sewage. It is surprising that the TISCO sewage treatment plant, which was set up 50 years ago, is still having the same capacity of 4 mgd. The population of TISCO township has risen to 4.1 lakh and the total quantity of daily water supply is 25 mgd. On the basis of this, about 20 million gallons of sewage is likely to be generated each day, out of which only one-fifth is treated and the rest is discharged into the river untreated. Additional treatment facilities are, thus, to be provided for 16 mgd. of waste water to serve a population of 4.1 lakh for proper sanitation in the town. The sewerage system of

TISCO is being maintained properly. For operation and maintenance of the total sewerage system, a sum of Rs. 36.3 lakh is being spent annually, i.e. Rs. 38.6 per capita.

TELCO CASE

The second treatment plant at Jamshedpur was set up by TELCO in 1965. The size of the plant is comparatively small to cater to the needs of the TELCO township, having a population of 35,000. Treatment facilities have been provided for 2.7 mgd. of waste water collected through sewerage. The cost of this activated sludge plant is Rs. 200 lakh at the 1983-84 price level, i.e. Rs. 571.4 per capita. The supply is 4 mgd. on an average, as revealed by the questionnaire; which means that 67.5 per cent of the water supply generated is waste water.

The maintenance of sewage treatment plant is quite satisfactory, although the cost of maintenance in this case is also quite high. TELCO is spending Rs. 12 lakh per year for the operation and maintenance of the sewerage system which is Rs. 34.28 per capita. This is, however, slightly less when compared with that of TISCO. In Ranchi, two sewage treatment plants are functioning, one for the township of the Heavy Engineering Corporation and the other for the Metallurgical and Engineering Consultants (India) Ltd., in their housing colonies. Both the plants were set up in 1981, the former being of conventional type having activated sludge process system while the latter, built by Mecon, has aerated lagoons system (mechanised oxidation).

The sewage plant of the Heavy Engineering Corporation has a capacity of 4.5 mgd. to serve a population of 1.35 lakh, but the volume of sewage being treated is only 1.0 mgd., as most of the waste water is intercepted by the local cultivators on the way to the sewage plant for irrigating their fields. The cost of the plant, according to the 1983-84 price index, is Rs. 5.29 lakh which comes to Rs. 423.4 per capita, excluding house connections, on the basis of the present population of the township. Although a sum of Rs. 18 lakh is spent annually for its maintenance and operation, the per capita expenditure being Rs. 14.4, the users are not very happy with the system. The manhole covers are frequently stolen. Scavengers are not easily available to clean the pipes jammed for one reason or other. Ordinary labour is reluctant to do this job because of the presence of human excreta in the

pipes. The operation of the plant is often handicapped due to non-availability of spare parts; as some of them have to be obtained from outside the State.

The second plant meant for the township of Mecon is of a very low capacity of 0.44 mgd. to serve only 5,500 people. Its process of treatment is by 'aerated lagoons'. The cost of its construction is Rs. 50.22 lakh, estimated at the then prevailing price level. The per capita cost at Rs. 540 was the highest among the oxidation plants. The expenditure over its maintenance is Rs. 2.15 lakhs per year (Rs. 39.3 per capita), which is the highest among all the plants under study. Its functioning is very good and users are very much satisfied with its performance. Only a fraction of the population in Ranchi - 1.305 lakh out of 5.38 lakh (24.3 per cent) - is having the facility of sewerage and sewage treatment.

BOKARO STEEL CITY

Bokaro Steel City is the only place where the entire population of 2.8 lakhs is being served by the sewerage system and the sewage treatment plant. It was set up in 1968 at a cost of Rs. 10 crore at the then prevailing price index, the per capita cost being 353.6. It is also an oxidation plant with a capacity of 20 mgd. The total water supply of the residential colony per day is 24 million gallons, of which the generation of waste water treated is 20 mgd. (i.e. 83 per cent). Its operation and maintenance is, on the whole, not unsatisfactory as revealed during the investigation. The main constraints are theft of man-hole covers and shortage of scavengers for cleaning the pipes when blocked. The expenditure incurred was Rs. 5.0 lakh per year which was very low when calculated on the basis of per capita cost. It was Rs. 1.8 which was higher than that of Patna.

BARAUNI PLANT

Barauni has two sewage treatment plants like those in Jamshedpur and Ranchi. The first plant, commissioned in 1974, served the township of the Indian Oil Corporation and the second, commissioned in 1978, was for the Hindustan Fertilizer Corporation (HFCL). The process of treatment in both the plants is different. While it is an "activated sludge" process in the Indian Oil Corporation, there is oxidation system in the HFCL. The

construction cost of the plant at the Indian Oil Corporation was Rs. 256 lakh and it served a population of 20,000. The per capita cost was Rs. 1,230.00 which topped all other plants in the State. Although it was designed for a capacity of 1.3 mgd., the volume of waste water being treated is only 0.95 mgd., against a water supply of 1.3 mgd. (73 per cent). The operation and maintenance cost of the plant is also very high. It is Rs. 37.5 per capita, the annual expenditure being Rs. 7.5 lakh at 1978 price-line. This plant too suffers from a number of defects in its maintenance, like removal of manhole covers, shortage of spares at times and lack of trained personnel for operation of the treatment plant.

The HFCL plant is of the smallest capacity of 0.44 mgd. against a water supply of 0.66 mgd. The actual volume of waste water treated in this plant is only 0.29 mgd. The per capita cost of its construction is Rs. 393.00 for a population of 6,000, the total coming to Rs. 23.6 lakh at the then prevailing price level. Here again the maintenance and operation cost of Rs. 2 lakh per year for 6,000 persons is very high. It is Rs. 33.3 per capita which is the second highest among the oxidation plants set up in the State. The users appear to be fully satisfied with its working and no serious complaint was made during the field inquiry. A population of 26,000 only is being served by both the plants together, which is 43 per cent of the total population of Barauni (60,312).

As regards collection, treatment and disposal of sewage, the present position is far from satisfactory in Bihar. It is worthwhile to mention that out of 14 class-I and 25 class-II towns in Bihar having a population of 55.6 lakh (estimated population in 1984 based on the 1981 census), only one town, Bokaro Steel City, having a population of 2.8 lakhs (5 per cent) has full sewage treatment facility. The other four towns, Patna, Jamshedpur, Ranchi and Barauni, with an estimated population of 21.85 lakhs (42.3 per cent), are having only partial sewage treatment facility. The sewerage and sewage treatment facilities are totally absent in almost all the Class III towns of the State.

The survey revealed that out of the 93.3 lakh urban population of Bihar, 86.65 lakh (92.8 per cent) are living without any sewerage facility. Even those who have been provided with this facility, only 1.4 per cent of them have exclusive use of flush latrines connected with sewers and the rest (5.8 per cent) either share with other

households or make use of public toilets. It is also noticed that no proper facilities exist for collection in most of the towns, let alone treatment of waste water after collection. This appears to be the prime reason for the critical insanitary condition in many towns of Bihar.

The cost of sewerage per capita is largely dependent on population density, waste water production, topography of the area, the type of soil through which the sewer is to run and the optimum planning for the sewerage zones. Similarly, the cost of sewage treatment depends on the type and capacity of the treatment plant. The total cost is, therefore, not uniform all over the State. ●

In this century, more people died
of sanitation-related diseases than
in global conflicts. - WHO

Magnitude of sanitation problem - a status report

We are inheritors of the great Indus Valley Civilisation which existed some four thousand years ago. It was characterised by meticulous town planning and high standards of public sanitation. Its covered drainage system remained unsurpassed till modern times. *Charaka Samhita* and *Susruta Samhita*, the famous medical treatises, which were compiled about 2,000 years later, also laid great stress on personal and general hygiene. However, we witness a dismal situation if we take a look at the present state of public sanitation in the country.

About 750 million people (out of 950 million population in 1998) defecate in the open along railway tracks and in open parks or use bucket (dry) privies or community toilets. It is like the entire European population sitting on their haunches from the Elbe, in the East, to the Pyreness, in the West. The severity of the problem can be judged from the fact that hardly 20 per cent of the urban population have access to flush arrangements connected to sewerage system; 14 per cent have water-based toilets connected to septic tanks, 33 per cent have bucket latrines and the remaining 33 per cent do not have access to any latrine facility. The coverage in rural areas is only three per cent. Nearly 79 per cent of the population in India either defecate in the open or use bucket (dry) privies or community toilets. The Task Force on Scavengers constituted by the Planning Commission, had assessed in its report (1990-91) that the number of bucket (dry) privies in India is about 7.6 million, of which 5.4 million exist in urban areas. In towns and cities, human excreta from buckets is often spilled in the vicinity during transportation to the disposal site. It is a common sight to find excreta flowing in open drains due to defecation by children and adults also. Washing from the bucket privies and the hazardous septic tank effluent also find their way into the drains flowing in front of houses. Open defecation defiles ecology, fouls water resources and causes stink in inhabited areas. Man is

exposed to nakedness, a wholly unacceptable situation in a civilised society.

At the time of 1991 Census, it was found that the percentage of households with toilet facility was only 23.70 per cent. In other words, more than 76 per cent of the people (or about three-fourth of the total population) in the country had no toilet facility at all. In the urban areas, the percentage of households with toilet facility was 63.85 per cent as against 58.15 per cent in 1981. More than one-third of the urban households in most States and Union Territories did not



In China, house-owners themselves carry human excreta to the field just after 15-20 days and use it as fertilizer

have toilet facilities, while more than half of the urban households in 177 districts did not have toilets. The percentage of households having toilet facilities in the rural areas at the time of 1991 census was only 9.48 per cent.

There was an appreciable increase in the availability of toilet facility in the urban areas as recorded in the 1991 census when compared with 1981. In terms of percentage the increase was registered in Mizoram (59.92), Lakshadweep (38.03), Sikkim (24.54), Meghalaya (15.54), Kerala (13.52), Dadra & Nagar Haveli (12.31), Andhra Pradesh (10.53), Arunachal Pradesh (10.49), Goa (9.31), Nagaland (9.03), Karnataka (9.24), Punjab and Pondicherry (8.48 each), Orissa (7.39), Manipur (7.07), Tamil Nadu (6.20), Haryana (6.18), Rajasthan (5.79), Gujarat (5.60), Andamans (5.18), Maharashtra (5.08), Himachal Pradesh (4.86), Uttar Pradesh (4.48) and Bihar (3.59). The other States/Union territories which recorded only marginal increase were Chandigarh (1.24), West Bengal (1.01), Tripura (0.65) and Madhya Pradesh (0.27). It is rather surprising that the metropolitan city of Delhi registered a decrease in the availability of toilet facility from 68.02 per cent in 1981 to 66.64 per cent in 1991. This may be presumably due to the constat immigration of people to Delhi from other areas since the last decade.

CENSUS OF INDIA 1991

Proportion (per cent) of households having electricity, safe drinking water and toilet facilities

| S.No. | India/State/Union Territory | Total Population | Electricity drinking water | Safe | Toilet and drinking water | Electricity and | Toilet and toilet | Electricity the three facilities | All of the three facilities | None |
|---------------|-----------------------------|-------------------|----------------------------|-------|---------------------------|-----------------|-------------------|----------------------------------|-----------------------------|-------|
| INDIA | | | | | | | | | | |
| 1. | (Excluding Jammu & Kashmir) | Total 838,583,988 | 42.37 | 62.30 | 23.70 | 30.42 | 18.22 | 20.35 | 16.07 | 24.54 |
| | | Rural 622,812,376 | 30.54 | 55.54 | 9.48 | 18.67 | 5.58 | 6.53 | 3.90 | 31.32 |
| | | Urban 215,771,612 | 75.78 | 81.38 | 63.85 | 63.60 | 53.90 | 59.37 | 50.46 | 5.41 |
| STATES | | | | | | | | | | |
| 2. | Andhra Pradesh | Total 66,508,008 | 46.30 | 55.08 | 18.40 | 27.85 | 12.95 | 17.37 | 12.27 | 26.12 |
| | | Rural 48,620,882 | 37.50 | 48.98 | 6.62 | 19.20 | 3.71 | 5.87 | 3.27 | 32.40 |
| | | Urban 17,887,126 | 73.31 | 73.82 | 54.60 | 54.42 | 41.33 | 52.69 | 39.90 | 6.81 |
| 3. | Arunachal Pradesh | Total 864,558 | 40.85 | 70.02 | 47.42 | 35.10 | 38.07 | 28.91 | 25.69 | 18.09 |
| | | Rural 753,930 | 33.38 | 66.87 | 42.62 | 28.35 | 32.61 | 21.88 | 18.94 | 20.53 |
| | | Urban 110,628 | 80.96 | 88.20 | 75.05 | 73.91 | 69.51 | 69.38 | 64.54 | 4.05 |
| 4. | Assam | Total 22,414,322 | 18.74 | 45.86 | 37.43 | 11.16 | 19.84 | 15.03 | 9.25 | 34.75 |
| | | Rural 19,926,527 | 12.44 | 43.28 | 30.53 | 6.51 | 14.60 | 8.48 | 4.50 | 38.85 |
| | | Urban 2,487,795 | 63.21 | 64.07 | 86.06 | 43.95 | 56.75 | 61.22 | 42.69 | 5.90 |
| 5. | Bihar | Total 86,374,465 | 12.57 | 58.76 | 11.75 | 8.94 | 8.78 | 9.30 | 7.13 | 36.80 |
| | | Rural 75,021,453 | 5.57 | 56.55 | 4.96 | 3.30 | 3.31 | 2.91 | 1.96 | 40.48 |
| | | Urban 11,353,012 | 58.77 | 73.39 | 56.54 | 46.16 | 44.87 | 51.43 | 41.22 | 12.54 |
| 6. | Goa | Total 1,169,793 | 84.69 | 43.41 | 40.65 | 38.11 | 21.80 | 39.72 | 21.50 | 9.38 |
| | | Rural 690,041 | 81.82 | 30.54 | 29.99 | 25.46 | 10.47 | 29.05 | 10.24 | 12.38 |
| | | Urban 479,752 | 88.77 | 61.71 | 55.82 | 56.11 | 37.92 | 54.89 | 37.51 | 5.10 |
| 7. | Gujarat | Total 41,309,582 | 65.93 | 69.78 | 30.69 | 50.91 | 27.29 | 29.84 | 26.63 | 15.00 |
| | | Rural 27,063,521 | 56.43 | 60.04 | 11.16 | 38.18 | 9.12 | 10.63 | 8.79 | 21.52 |
| | | Urban 14,246,061 | 82.96 | 87.23 | 65.71 | 73.71 | 59.84 | 64.27 | 58.61 | 3.31 |

| S.No. | India/State/Union Territory | Total | Population | Electricity drinking water | Safe | Toilet and drinking water | Electricity and | Toilet and toilet | Electricity the three facilities | All of the three facilities | None |
|-------|-----------------------------|-------|------------|----------------------------|-------|---------------------------|-----------------|-------------------|----------------------------------|-----------------------------|-------|
| | Rural Urban | | | | | | | | | | |
| 8 | Haryana | Total | 16,463,648 | 70.35 | 74.32 | 22.45 | 55.11 | 20.96 | 21.56 | 20.28 | 10.23 |
| | | Rural | 12,408,904 | 63.20 | 67.14 | 6.53 | 44.26 | 5.75 | 5.56 | 5.02 | 13.67 |
| | | Urban | 4,054,744 | 89.13 | 93.18 | 64.25 | 83.61 | 60.93 | 63.58 | 60.37 | 1.19 |
| 9 | Himachal Pradesh | Total | 5,170,877 | 87.01 | 77.34 | 12.39 | 69.70 | 11.35 | 11.96 | 11.05 | 5.23 |
| | | Rural | 4,721,681 | 85.86 | 75.51 | 6.42 | 67.26 | 5.56 | 5.99 | 5.26 | 5.76 |
| | | Urban | 449,196 | 96.24 | 91.93 | 59.98 | 89.20 | 57.59 | 59.53 | 57.21 | 0.95 |
| 10 | Karnataka | Total | 44,977,201 | 52.47 | 71.68 | 24.13 | 39.65 | 18.76 | 22.52 | 17.63 | 15.03 |
| | | Rural | 31,069,413 | 41.75 | 67.31 | 6.85 | 29.37 | 4.20 | 5.97 | 3.69 | 19.93 |
| | | Urban | 13,907,788 | 76.27 | 81.38 | 62.52 | 62.50 | 51.11 | 59.28 | 48.59 | 4.13 |
| 11 | Kerala | Total | 29,098,518 | 48.43 | 18.89 | 51.28 | 10.50 | 10.86 | 40.41 | 8.98 | 34.19 |
| | | Rural | 21,418,224 | 41.95 | 12.22 | 44.07 | 4.77 | 4.74 | 33.28 | 3.43 | 41.12 |
| | | Urban | 7,680,294 | 67.65 | 38.68 | 72.66 | 27.48 | 29.03 | 61.56 | 25.46 | 13.63 |
| 13. | Madhya Pradesh | Total | 66,181,170 | 43.30 | 53.41 | 15.07 | 28.15 | 12.52 | 14.27 | 11.97 | 31.19 |
| | | Rural | 50,842,333 | 34.49 | 45.56 | 3.64 | 18.43 | 2.37 | 3.16 | 2.10 | 38.16 |
| | | Urban | 15,338,837 | 72.52 | 79.45 | 53.00 | 60.42 | 46.21 | 51.13 | 44.72 | 8.07 |
| 14. | Maharashtra | Total | 78,937,187 | 69.40 | 68.49 | 29.56 | 51.54 | 26.59 | 28.57 | 25.82 | 13.42 |
| | | Rural | 48,395,601 | 58.45 | 54.02 | 6.64 | 33.34 | 4.45 | 6.14 | 4.17 | 20.64 |
| | | Urban | 30,541,586 | 86.07 | 90.50 | 64.45 | 79.24 | 60.28 | 62.70 | 58.77 | 2.43 |
| 15. | Manipur | Total | 1,837,149 | 50.92 | 38.72 | 43.13 | 23.47 | 18.79 | 30.62 | 15.40 | 24.72 |
| | | Rural | 1,331,504 | 41.73 | 33.72 | 33.02 | 15.52 | 10.84 | 20.28 | 7.51 | 30.67 |
| | | Urban | 505,645 | 75.45 | 52.10 | 70.16 | 44.72 | 40.05 | 58.23 | 36.47 | 8.82 |
| 16. | Meghalaya | Total | 1,774,778 | 29.16 | 36.16 | 31.11 | 18.54 | 18.40 | 20.52 | 14.81 | 46.23 |
| | | Rural | 1,444,731 | 16.34 | 26.82 | 18.13 | 7.40 | 6.78 | 7.01 | 3.62 | 56.27 |
| | | Urban | 330,047 | 83.04 | 75.42 | 85.69 | 65.40 | 67.29 | 77.31 | 61.85 | 4.01 |
| 17. | Mizoram | Total | 689,756 | 59.20 | 16.21 | 70.73 | 12.19 | 12.89 | 50.51 | 10.78 | 18.67 |
| | | Rural | 371,810 | 35.47 | 12.89 | 58.37 | 7.07 | 8.28 | 28.73 | 5.78 | 31.56 |
| | | Urban | 317,946 | 85.50 | 19.88 | 84.44 | 17.85 | 18.01 | 74.66 | 16.32 | 4.38 |

| S.No. | India/State/Union Territory | Total | Population | Electricity drinking water | Safe | Toilet and drinking water | Electricity and | Toilet and toilet | Electricity the three facilities | All of the three facilities | None |
|-------|-----------------------------|-------|-------------|----------------------------|-------|---------------------------|-----------------|-------------------|----------------------------------|-----------------------------|-------|
| 18. | Nagaland | Total | 1,209,546 | 53.42 | 53.37 | 37.49 | 28.51 | 20.32 | 27.25 | 15.01 | 16.78 |
| | | Rural | 1,001,323 | 47.16 | 55.60 | 26.86 | 25.86 | 15.42 | 17.08 | 9.81 | 18.93 |
| | | Urban | 208,223 | 75.58 | 45.47 | 75.10 | 37.87 | 37.66 | 63.21 | 33.41 | 9.18 |
| 19. | Orissa | Total | 31,659,736 | 23.54 | 39.07 | 9.81 | 10.59 | 5.73 | 9.09 | 5.40 | 47.58 |
| | | Rural | 27,424,753 | 17.45 | 35.32 | 3.58 | 5.81 | 1.25 | 3.02 | 1.04 | 52.69 |
| | | Urban | 4,234,983 | 62.11 | 62.83 | 49.27 | 40.86 | 34.09 | 47.51 | 33.01 | 15.23 |
| 20. | Punjab | Total | 20,281,969 | 82.31 | 92.74 | 33.18 | 77.44 | 31.37 | 32.18 | 30.51 | 2.25 |
| | | Rural | 14,288,744 | 76.98 | 92.09 | 15.79 | 72.22 | 14.87 | 14.61 | 13.86 | 2.98 |
| | | Urban | 5,993,225 | 94.60 | 94.24 | 73.23 | 89.48 | 69.38 | 72.62 | 68.84 | 0.56 |
| 21. | Rajasthan | Total | 44,005,990 | 35.03 | 58.96 | 19.57 | 27.37 | 17.03 | 17.53 | 15.72 | 32.65 |
| | | Rural | 33,938,877 | 22.44 | 50.62 | 6.65 | 14.77 | 4.84 | 4.71 | 3.72 | 40.89 |
| | | Urban | 10,067,113 | 76.67 | 86.51 | 62.27 | 69.03 | 57.33 | 59.93 | 55.39 | 5.45 |
| 22. | Sikkim | Total | 406,457 | 60.66 | 73.05 | 34.97 | 49.71 | 30.75 | 32.41 | 28.84 | 15.35 |
| | | Rural | 369,451 | 57.12 | 70.84 | 30.20 | 45.57 | 25.90 | 27.41 | 23.82 | 16.90 |
| | | Urban | 37,006 | 92.37 | 92.85 | 77.69 | 86.78 | 74.15 | 77.14 | 73.72 | 1.44 |
| 23. | Tamil Nadu | Total | 55,858,946 | 54.74 | 67.42 | 23.13 | 37.79 | 16.48 | 21.84 | 15.57 | 15.25 |
| | | Rural | 36,781,354 | 44.49 | 64.28 | 7.17 | 28.88 | 4.62 | 6.21 | 3.98 | 19.79 |
| | | Urban | 19,077,592 | 76.80 | 74.17 | 57.47 | 56.96 | 42.00 | 55.47 | 40.51 | 5.48 |
| 24. | Tripura | Total | 2,757,205 | 36.93 | 37.18 | 67.93 | 20.83 | 31.65 | 33.22 | 19.63 | 24.03 |
| | | Rural | 2,335,484 | 28.50 | 30.60 | 62.43 | 13.20 | 24.48 | 24.32 | 11.96 | 28.50 |
| | | Urban | 421,721 | 80.43 | 71.12 | 96.32 | 60.20 | 68.63 | 79.20 | 59.24 | 0.93 |
| 25. | Uttar Pradesh | Total | 139,112,287 | 21.91 | 62.24 | 18.02 | 18.54 | 15.96 | 14.10 | 12.69 | 33.75 |
| | | Rural | 111,506,372 | 10.96 | 56.62 | 6.44 | 8.28 | 5.30 | 3.46 | 2.89 | 40.13 |
| | | Urban | 27,605,915 | 67.76 | 85.78 | 66.54 | 61.52 | 60.60 | 58.68 | 53.72 | 7.00 |
| 26. | West Bengal | Total | 68,077,965 | 32.90 | 81.98 | 31.51 | 27.87 | 27.54 | 23.47 | 20.48 | 12.01 |
| | | Rural | 49,370,364 | 17.75 | 80.26 | 12.31 | 14.34 | 10.65 | 6.53 | 5.54 | 15.65 |
| | | Urban | 18,707,601 | 70.19 | 86.23 | 78.75 | 61.17 | 69.13 | 65.16 | 57.25 | 3.04 |

| S.No. | India/State/Union Territory | Total | Population | Electricity drinking water | Safe | Toilet and drinking water | Electricity and | Toilet and toilet | Electricity the three facilities | All of the three facilities | None |
|--------------------------|-----------------------------|-------|------------|----------------------------|-------|---------------------------|-----------------|-------------------|----------------------------------|-----------------------------|-------|
| | Rural | | | | | | | | | | |
| | Urban | | | | | | | | | | |
| UNION TERRITORIES | | | | | | | | | | | |
| 27. | Andaman Nicobar Islands | Total | 280,661 | 63.52 | 67.87 | 36.88 | 50.59 | 31.58 | 34.11 | 29.73 | 18.28 |
| | | Rural | 205,706 | 53.62 | 59.43 | 26.32 | 38.64 | 21.03 | 22.75 | 18.68 | 24.37 |
| | | Urban | 74,955 | 90.55 | 90.91 | 65.72 | 83.22 | 60.40 | 65.13 | 59.91 | 1.66 |
| 28. | Chandigarh | Total | 642,015 | 83.12 | 97.73 | 70.80 | 81.47 | 69.31 | 69.87 | 68.46 | 0.55 |
| | | Rural | 66,186 | 65.25 | 98.11 | 3.05 | 63.71 | 2.91 | 2.93 | 2.81 | 0.32 |
| | | Urban | 575,829 | 85.48 | 97.68 | 79.77 | 83.83 | 78.11 | 78.74 | 77.16 | 0.58 |
| 29. | Dadra & Nagar Haveli | Total | 138,477 | 54.42 | 45.57 | 15.42 | 31.64 | 13.77 | 15.06 | 13.51 | 31.55 |
| | | Rural | 126,752 | 51.20 | 41.17 | 10.59 | 26.88 | 9.08 | 10.28 | 8.87 | 34.40 |
| | | Urban | 11,725 | 87.57 | 90.97 | 64.14 | 80.67 | 62.09 | 64.40 | 61.34 | 2.14 |
| 30. | Daman and Diu | Total | 101,586 | 94.13 | 71.42 | 26.57 | 67.46 | 22.57 | 26.33 | 22.38 | 1.85 |
| | | Rural | 54,043 | 92.87 | 56.87 | 8.39 | 52.55 | 6.13 | 8.28 | 6.06 | 2.78 |
| | | Urban | 47,543 | 95.46 | 86.76 | 45.75 | 83.18 | 39.90 | 45.35 | 39.59 | 0.87 |
| 31. | Delhi | Total | 9,420,644 | 79.48 | 95.78 | 63.38 | 76.93 | 61.56 | 59.86 | 58.16 | 1.54 |
| | | Rural | 949,019 | 59.85 | 91.01 | 29.60 | 56.25 | 28.50 | 19.22 | 18.41 | 5.10 |
| | | Urban | 8,471,625 | 81.38 | 96.24 | 66.64 | 78.92 | 64.75 | 63.79 | 62.00 | 1.20 |
| 32. | Lakshadweep | Total | 51,707 | 98.46 | 11.90 | 71.02 | 11.75 | 5.28 | 70.74 | 5.26 | 1.12 |
| | | Rural | 22,593 | 97.65 | 3.41 | 78.88 | 3.28 | 1.94 | 78.41 | 1.91 | 1.77 |
| | | Urban | 29,114 | 99.11 | 18.79 | 64.65 | 18.61 | 7.99 | 64.52 | 7.97 | 0.60 |
| 33. | Pondicherry | Total | 807,785 | 63.58 | 88.75 | 34.88 | 56.01 | 30.07 | 33.37 | 28.83 | 3.41 |
| | | Rural | 290,800 | 51.20 | 92.86 | 11.85 | 47.47 | 10.98 | 9.79 | 9.03 | 3.31 |
| | | Urban | 516,985 | 71.71 | 86.05 | 50.02 | 61.63 | 42.62 | 48.88 | 41.86 | 3.48 |

The toilet facility was available by varying degrees to the urban households in different States and Union Territories. The lowest percentage of 49.27 was found in Orissa and the highest percentage of 96.32 in Tripura. If the States/Union Territories are arranged in ascending order, according to the percentage of availability of toilet facilities based on 1991 Census, the eight North-eastern States of Arunachal Pradesh, Assam, Meghalaya, Mizoram, Manipur, Nagaland, Sikkim and Tripura top the list (more than 81 per cent), followed by West Bengal (78.75), Punjab (73.23), Kerala (72.66), Delhi (66.64), Uttar Pradesh (66.54), Karnataka (62.52), Gujarat (65.71), Maharashtra (64.45), Haryana (64.25), Karnataka (62.52), Rajasthan (62.27), Himachal Pradesh (59.98), Tamil Nadu (57.47), Bihar (56.54), Goa (55.82), Andhra Pradesh (54.60), Madhya Pradesh (53.00), and Orissa (49.27). Among the Union Territories Chandigarh (79.77) tops the list followed by Andamans (65.72), Dadra & Nagar Haveli (65.14), Lakshadweep (64.65), Pondicherry (50.02), and Daman & Diu (45.75).

SIZE OF THE PROBLEM

It is estimated that nearly two billion people (about a third of world's population) are without adequate basic sanitation facilities and by the year 2000 the number may increase to 3 billion.

In India, more than 750 million people out of 950 million population either defecate in the open or use sanitary bucket (dry) privies cleaned manually by scavengers. Hardly 20 per cent of the urban population have access to waterflush toilets connected to sewerage system. And, 14 per cent have access to water-borne toilets connected to septic

| Country | Life expectancy at birth (in years) | GNP per head (in US Dollars) |
|-------------|-------------------------------------|------------------------------|
| Brazil | 53 | 2050 |
| China | 64 | 290 |
| Mexico | 65 | 2090 |
| South Korea | 65 | 1520 |
| Sri Lanka | 66 | 270 |

As the figures for the 1980 in the table show that Sri Lanka with less than one seventh the GNP per head has similar life expectancy as figures to Brazil or Mexico. At this time South Korea, heralded as an economic miracle, had not overtaken Sri Lanka in this indicator. (Based 1998)

tanks, 33 per cent have bucket (dry) privies and the remaining 33 per cent do not have any latrines in their houses at all. Out of nearly 4800 towns/cities, hardly 232 towns and cities have sewerage system at present. None of them, however, covers the entire municipal city area, leave alone the adjoining suburbs included in the municipal limits. In most of the urban areas even on the streets where sewers have been laid, houses have not been connected in spite of municipal laws making such connections compulsory. Thus, insanitation continues. In the rural areas, 102 million households have no toilets facility at all.

It is unanimously accepted that the introduction of the sewerage system may solve this problem to a large extent, but because of high cost this system remains a distant possibility. It has been estimated that if the entire revenue earning of the Central and State Governments of the next 50 years is spent on providing underground sewerage, even half the population of the country would hardly be covered. From the above it is evident that the problem of safe disposal of human waste is very urgent. (Source: Planning Commission's Task report 1990-91)

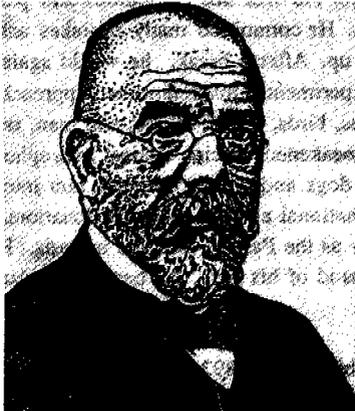
In a recent report (March 1998) on South Asia, the world renowned Pak growth economist, late Mehbub-ul-Haq, who wrote UNDP Human Developments Reports, has pointed out that "India has 135 million people who have no access to basic health facilities; 226 million lack access to safe drinking water; half of India's adult population is illiterate, 70 per cent lack basic sanitation facilities, 40 per cent of the people survive in absolute poverty." One-third of the absolute poor in the world live in India which has also the distinction of having the largest illiterate population in the world. A recent report (July 1998) from the Tata Energy Research Institute (TERI) agreed. "Nearly half the country's population does not have access to drinking water; about 90 per cent of the water supply is polluted with only 10 per cent of sewage treatment plants in working order. Sanitation is the dominant issue which is not adequately addressed."



Mehbub-ul-Haq

STINKING CITIES

Large and festering city slums, where lumpen and sexually productive people live in varying state of deprivation, are the victims of our age. With expansion of cities, scope for open



Robert Koch, (1843-1910), who established the link between germs and diseases

defecation in cities have shrunk. No wonder, people are seen easing themselves along roads, railway tracks and in parks - a humiliating sight. The sewerage networks are far too inadequate and expensive to carry waste and sullage into rivers. Consequently, more bucket latrines have come up in unauthorised colonies and the number of scavengers grew. Loss in working days due to sanitation related diseases work out to millions every year. According to the World Health Organisation (1992), every year about eight million new cases of tuberculosis are added globally, with

India contributing 1.2 million to this number; 5 per cent of our population carry the *hepatitis B virus* which causes jaundice, a potentially fatal disease if left untreated and annually about 2.11 per cent of people are infected with malaria. Approximately, the same number of births occur in China and India, but the death rate among children is three times higher in India. *Praynay Gupte* (*Time*, May 25, 1998) says that India loses 10 billion dollar (half the total currency reserve in RBI) in productivity each year through workers' illness caused by deteriorating physical conditions.

Sanitation involves waste disposal systems, water supply, sewerage networks and preserving ecology. And, on all these counts, India is very deficient. Our cities and towns are among the dirtiest in the world. The stinking uncleaned garbage heaps, a large number of people defecating in the open or urinating up the walls even in the so-called posh areas, degraded land and destroyed forests - all these indicate bad health of the people living in a decaying society. The increased application of technology has created wealth centers, touching off migration of people far beyond the capacity of cities and towns to support them. These people live in slums and dirty around the places.

The scope of sanitation may vary and emphasis may shift with the need of communities, but in developing countries, safe disposal of faeces is very vital for improving health and the environment. As mentioned previously, studies carried out in India and abroad indicate that human excreta is the cause of many enteric diseases such as cholera, dysentery, typhoid, paratyphoid, infectious hepatitis, hookworm, diarrhoea, etc. Over 50 infections can be transferred from a diseased person to a healthy one by various direct or indirect routes from human excreta and causes nearly 80 per cent sickness. Therefore appropriate human waste management should be the primary objective of improved sanitation to build a healthy society and provide a cleaner environment.



**Louis Pasteur, (1822-1895),
Father of Microbiology**

Strangely enough enteric diseases are not often timely spotted, and the damage they cause is not adequately recognised even today. The Press ignores stories on water supply and sanitation, because they don't make hot news and their reading is dull and soporific. Nor can many reporters put the information and knowledge about them in attractive news package to sell them hot to readers. No wonder, sanitation is never high on the agenda of the developing countries where it has been singled out as the most potent source of poverty, bad health, low productivity and much else besides. To be true, water and sanitation put together, should be studied along with

land, labour and capital while making plans for national growth. Water and sanitation are not only health problems, but areas where investment is woefully inadequate. These are still more than four lakh scavengers in the country who physically clean and carry human excreta manually, working on 7.6 million service latrines.

The survival and well being of a nation depend on sustainable development. The former World Bank Chairman, Robert MacNamara, had remarked that for better economic growth rate and higher productivity, emphasis has to be given to the health of the people for which provision of public utilities like water supply and sanitation is necessary. Benefits of safe water are limited without sanitation. Due to insanitation water courses get

polluted, incidence of diseases rises, labour force is affected, productivity of industry and agriculture falls, putting stresses on budgetary resources needed for development. The people who are unserved with basic facilities of water supply and sanitation, are the poor ones. They lack not only the means to have such facilities but also information on how to minimise the ill effects of insanitary conditions in which they live.

These cold statistics, however, do not fully reflect the magnitude of the problem. A large number of houseless people living in slums or on pavements have been counted out of the census. The entire rural population in India, which is more than the population of Europe and Africa put together, have no organised toilet facilities worth the name.

MICROBES CONTROL

Our present record in the area of public hygiene and in control of infectious diseases is poor, even in Asia. The incidence of these diseases is four times higher in India as compared to China, despite our higher per capita expenditure on health. They lead to considerable loss of life and working time, resulting in low economic activities and poor quality of life. The current situation urgently demands that people be made aware of microbes and the role they play in causing diseases so that the right measures to control infectious diseases are taken. One has then to devise strategies to limit the breeding grounds of microbes, take steps to avoid their spread, instill good hygienic habits in the masses and also provide facilities such as those which are part of the Sulabh Movement. Sensitizing the masses about the close connection between microbes and diseases by providing proper information and understanding is another important task in this fight against infectious diseases.



Sulabh teams have been travelling all over the world to attend to sanitation-related problems

The scientific basis of the connection between lack of sanitation and infectious diseases was provided by Louis Pasteur, Robert Koch, Elie Metchnikoff and other 'microbe hunters' who established that these diseases are caused by micro-organisms, viz *bacteria, fungi and viruses*. Antoni van Leeuwenhoek was the first person to work on microbes by peering through microscopes of his own making. The work of these and several other scientists resulted in mankind's biggest advance in fighting diseases. Ronald Ross's work on malaria carried out at Calcutta and that of Valdemar Haffkine on plague at Bombay are some other exciting episodes in the same pursuit of tracking deadly microbes.

The work of these and several other scientists led to the development of three concepts which play an important role in the control of infectious diseases. These are: (a) infectious diseases are caused when we come in contact with pathogens; (b) these pathogens are present in several environmental reservoirs, which include drinking water, food, garbage heaps, sewage and human excreta; (c) one can protect oneself from these diseases by avoiding contact with the pathogenic micro-organisms. The most effective way to do this is to eliminate the environmental reservoirs of these microbes; the second best alternative is to keep ourselves away from these reservoirs. As the links between microbes and diseases became clear, people understood the reasons why simple measures, especially involving personal and public hygiene, protected them from infectious diseases. Advances in immunology (vaccination) and antibiotics soon followed, and the global health situation improved still further.

India has an unenviable record of high incidence of several infectious (and non-infectious) diseases. The 1993 World Development Report, *Investing in Health*, ranks India next only to Sub-Saharan African countries (all countries south of the Sahara, excluding Mauritius, and Seychelles) and some countries in the Middle East, in the number of people afflicted with infectious diseases. In Sub-Saharan Africa, infectious diseases account for 71 per cent of all diseases. The corresponding percentages are 50.5 per cent, 25.3 per cent, 8.6 per cent and 9.7 per cent for India, China, the former socialist economies of Europe and the more developed countries, respectively.

China with a population of 1,134 million and nearly comparable incomes (in 1990) has achieved a marked improvement in health and sanitation status of its people during the past 15 years, especially with reference to infectious diseases. In any given

year, an average Indian loses at least four times more healthy days due to infectious diseases than does an average Chinese. This is not due to lower expenditure on healthcare but lack of concern for health and sanitation. Indeed, India spends more funds per person (\$ 21/annum) on healthcare than China (\$ 11/annum) only to be behind it in the race. (Source: *Microbes and Disease* by M.S. Mahajan.)

However, the significant difference lies in the fact that China has spent a considerable amount in the public sector on specific public health measures, rather than on setting up hospitals and other facilities for treatment of diseases as is done in India. Public health programmes, which have a direct bearing on promoting a healthy environment, include provision of clean and adequate quantities of water, and sanitation, sewerage and solid-waste collection and disposal. Direct investment in the development of these programmes leads to removal of reservoirs of pathogens and, in turn, to reduction in the incidence of infectious diseases. And, a healthy and growing society.

Of the 4.4 billion people living in the developing countries, almost three-fifths have no basic sanitation facilities, one-third have no safe drinking water, a quarter lack adequate housing, one-fifth have no healthcare facilities, and one-fifth of children drop out of schools. An estimated 2.7 million deaths occur each year from air pollution alone. Although the global consumption of goods and services has expanded at an unprecedented pace in the twentieth century, (with the public and private consumption expenditures



A view of Dharavi, Mumbai, the largest slum in Asia which has no basic sanitation facilities at all

reaching \$24 trillion in 1998, six times the figure for 1995), civic facilities have declined relative to population. This was revealed in the *Human Development Report 1998*.

The report focuses on consumption of goods and services and looks at how the global consumption boom has resulted in historic gains in human development. India, which was ranked 138th in 1998, has slipped one rank to 139, just behind Pakistan, in 174 countries. However, India has a more equitable distribution of resources as the country has adopted "*fairly pro-poor policies*".

The report adds that 20 per cent people consume 86 per cent world's resources. The gross inequalities in consumption has excluded over one billion people who fail to meet even their basic consumption requirements. The wealthiest one-fifth of the world's people consume 45 per cent of the meat and dish, 58 per cent of the total energy. They have 74 per cent of the telephone lines; use 84 per cent of all paper and own 87 per cent of the world's vehicles. The poorest fifth, on the other hand, consume less than 5 per cent of meat and fish, 4 per cent of total energy; they have 1.5 per cent telephone lines, use merely 1.1 per cent of paper and own less than 1 per cent of the world's automobiles. Though the poorest one-fifth are responsible for barely three per cent of carbon dioxide emissions, they are the most vulnerable to the rising sea levels associated with global warming as they live in the low-lying regions. The wealthiest one-fifth consume 53 per cent of the fossil fuels, accounting for a far larger share of carbon dioxide emissions.

With one metre rise in the sea level, Bangladesh would lose 17 per cent of its land area and Egypt 12 per cent. Much of the land of small island-nations, such as Maldives, would also disappear beneath waves. These and many other countries will disappear in water because the rich people consume more resources than can be fully met by the nature without damage to its ecological structure, including damage to the ozone layer which will produce floods and high water. And the consequent loss of some countries.

The report places India at 128 in gender-related development index (GDI), a life expectancy at birth of 61.8 for females and 61.4 for males; an adult literacy rate of 37.7 per cent for females and 65.5 per cent for males; combined first-second-third level gross enrolment ratio of 46.5 per cent for females and 60.1 per cent for males; percentage of shared income being 25.4 per cent for females and 74.6 per cent for males and a GDI value of 0.424. The top ten countries in order, are Canada, France, Norway, USA, Iceland,

Finland, Netherlands, Japan, New Zealand and Sweden. China is ranked 106.

A child born in the industrial world consumes and pollutes more in his or her lifetime than do 30-50 children in poor countries. The report also mentions the health status of the poor countries to highlight the fact that insanitation causes more damage to society than most people seem to realise. (Source: UNDP report 1998)

A GLOBAL VIEW

Of the estimated 3.5 million children who die from diarrhoeal diseases each year in developing countries, almost 600,000 die from the sanitation-related ailments alone. This disease is endemic throughout the world. Refugee population and children suffering from malnutrition are among the badly affected. During 1994, dysentery was the leading cause of death in the Rwandan refugee camps in Burundi, Tanzania, and Zaire. Elsewhere in Africa, 11 countries were hit by water-related epidemics in 1994 in Asia. There are four clinically important species of *Shigellae* (dysentery) but most life-threatening diseases are caused by just two species - *S. dysenteriae* and *S. flexneri* - and by 5 serotypes. *S. sonnei* is the leading cause of endemic disease in industrialised countries. In 1993, it was responsible for over 90 per cent of cases of dysentery reported in the USA. And, all of them are caused in unclean areas.

Vibrio cholerae - one of the oldest scourges known to men - causes about 5.5 million cases of cholera every year and about 120,000 deaths, i.e. over a fifth of those deaths occur among children under five and a quarter in children aged 5 to 14. Most cholera deaths occur in Africa and Asia. Without treatment (rehydration therapy and antibiotics) it is one of the most dangerous infectious diseases - leading to fatality rates as high as 40 per cent. The disease is associated with poverty, poor sanitation, lack of hygiene and unsafe drinking water. It is spread by contaminated water or food and by person-to-person contact.

In 1991, there were more cases of cholera and more countries were affected by this disease than in any other year on record. Both Latin America and Africa were hit by explosive epidemics. The first outbreak occurred in Peru and spread rapidly throughout South and Central America - sparing only seven countries. More than 4,000 people died. In the same year, a major epidemic swept

GLOBAL COVERAGE

Water supply and sanitation coverage (% population served) - 1994

(Source: Water Supply and Sanitation Collaborative Council)

ASIA AND PACIFIC

| Country | 1994 pop ('000) | Reference year | Water supply coverage (%) | | | Sanitation coverage (%) | | |
|------------------------------|--------------------|-------------------|---------------------------|-------|-------|-------------------------|-------|-------|
| | | | Urban | Rural | Total | Urban | Rural | Total |
| Afghanistan | 18,870 | 1994 | 39 | 5 | 12 | 38 | 1 | 8 |
| Bangladesh | 117,787 | 1994 | 100 | 97 | 97 | 77 | 30 | 35 |
| Bhutan | 600 | 1994 | 75 | 54 | 64 | 66 | 18 | 41 |
| China | 1,196,360 | 1993 | 93 | 89 | 90 | 58 | 7 | 21 |
| Fiji | 758 | 1993 | 100 | 100 | 100 | 100 | 85 | 92 |
| India | 918,570 | 1994 | 85 | 79 | 81 | 70 | 14 | 29 |
| Indonesia | 191,671 | 1993 | 78 | 54 | 62 | 73 | 40 | 51 |
| Iran | 62,507 | 1992 | 89 | 77 | 83 | 89 | 37 | 67 |
| Kiribati | 76 | 1993 | 100 | 100 | 100 | 100 | 100 | 100 |
| Lao PDR | 4,605 | 1993 | 40 | 39 | 39 | 70 | 13 | 24 |
| Maldives | 238 | 1993 | 98 | 86 | 89 | 95 | 26 | 44 |
| Micronesia, Fed. State of | 118 | 1993 | 100 | 100 | 100 | 100 | 100 | 100 |
| Myanmar | 44,596 | 1993 | 36 | 39 | 38 | 42 | 40 | 41 |
| Nepal | 19,755 | 1991 | 66 | 41 | 44 | 51 | 16 | 20 |
| Niue | 2 | 1993 | 100 | 100 | 100 | 100 | 100 | 100 |
| Pakistan | 136,645 | 1994 | 77 | 52 | 60 | 53 | 19 | 30 |
| Papua New Guinea | 4,110 | 1993 | 84 | 17 | 28 | 82 | 11 | 22 |
| Philippines | 63,427 | 1992 | 93 | 77 | 85 | 87 | 67 | 77 |
| Sri Lanka | 17,671 | 1992 | 43 | 47 | 46 | 33 | 58 | 52 |
| Tokelau | 2 | 1993 | 100 | 100 | 100 | 100 | 100 | 100 |
| Tonga | 98 | 1993 | 100 | 100 | 100 | 100 | 100 | 100 |
| Tuvalu | 9 | 1993 | 100 | 95 | 97 | 90 | 85 | 87 |
| Vietnam | 72,931 | 1994 | 53 | 32 | 36 | 43 | 15 | 21 |

WESTERN ASIA

| | | | | | | | | |
|------------------|--------|------|-----|-----|-----|-----|-----|-----|
| Iraq | 19,925 | 1994 | NA | NA | 44 | NA | NA | 36 |
| Jordan | 4,443 | 1991 | NA | NA | 89 | NA | NA | 95 |
| Lebanon | 3,700 | 1994 | 100 | 100 | 100 | 100 | 100 | 100 |
| Oman | 1,909 | 1992 | NA | NA | 63 | NA | NA | 76 |
| Syrian Arab Rep. | 13,696 | 1993 | 92 | 78 | 85 | 77 | 35 | 56 |

Water supply and sanitation coverage (% population served) - 1994

LATIN AMERICA AND THE CARIBBEAN

| Country | 1994 pop ('000) | Reference year | Water supply coverage (%) | | | Sanitation coverage (%) | | |
|----------------|--------------------|-------------------|---------------------------|-------|-------|-------------------------|-------|-------|
| | | | Urban | Rural | Total | Urban | Rural | Total |
| Belize | 210 | 1994 | 96 | 82 | 89 | 23 | 87 | 57 |
| Bolivia | 6,893 | 1992 | 78 | 22 | 55 | 58 | 16 | 41 |
| Brazil | 146,825 | 1991 | 85 | 31 | 72 | 55 | 3 | 44 |
| Chile | 13,600 | 1992 | 94 | 37 | 85 | 82 | NA | NA |
| Colombia | 33,985 | 1993 | 88 | 48 | 76 | 76 | 33 | 63 |
| Costa Rica | 3,192 | 1992 | 85 | 99 | 92 | 85 | 99 | 92 |
| Cuba | 10,960 | 1994 | 96 | 85 | 93 | 71 | 51 | 66 |
| Dominican Rep. | 7,543 | 1993 | 74 | 67 | 71 | 76 | 83 | 78 |
| Ecuador | 10,980 | 1993 | 82 | 55 | 70 | 87 | 34 | 64 |
| El Salvador | 5,517 | 1993 | 78 | 37 | 55 | 78 | 59 | 68 |
| Guyana | 808 | 1992 | 90 | 45 | 61 | 82 | 80 | 81 |
| Haiti | 7,035 | 1994 | 37 | 23 | 28 | 42 | 16 | 24 |
| Honduras | 5,493 | 1994 | 81 | 53 | 65 | 81 | 53 | 65 |
| Mexico | 90,027 | 1993 | 91 | 62 | 83 | 81 | 26 | 66 |
| Nicaragua | 4,255 | 1994 | 81 | 27 | 61 | 34 | 27 | 31 |
| Panama | 2,491 | 1992 | NA | NA | 83 | NA | NA | 86 |
| Peru | 22,886 | 1993 | 74 | 24 | 60 | 62 | 10 | 44 |
| Venezuela | 19,502 | 1990 | 80 | 75 | 79 | 64 | 30 | 58 |

Water supply and sanitation coverage, (% population served) - 1994

AFRICA

| Country | 1994 pop ('000) | Reference year | Water supply coverage (%) | | | Sanitation coverage (%) | | |
|-------------------|--------------------|-------------------|---------------------------|-------|-------|-------------------------|-------|-------|
| | | | Urban | Rural | Total | Urban | Rural | Total |
| Angola | 10,674 | 1994 | 69 | 15 | 32 | 34 | 8 | 16 |
| Benin | 5,096 | 1993 | 41 | 53 | 50 | 54 | 6 | 20 |
| Burkina Faso | 9,772 | 1993 | NA | NA | 78 | 42 | 11 | 18 |
| Burundi | 5,847 | 1992 | 92 | 49 | 52 | 60 | 50 | 51 |
| Cape Verde | 350 | 1991 | 70 | 34 | 51 | 40 | 10 | 24 |
| Cent African Rep. | 3,001 | 1991 | 18 | 18 | 18 | NA | NA | NA |
| Chad | 6,183 | 1994 | 48 | 17 | 24 | 73 | 7 | 21 |
| Cote d'Ivoire | 13,780 | 1994 | 59 | 81 | 72 | 59 | 51 | 54 |
| Djibouti | 557 | 1993 | 77 | 100 | 90 | 77 | 100 | 90 |
| Egypt | 60,319 | 1993 | 82 | 50 | 64 | 20 | 5 | 11 |
| Equatorial Guinea | 389 | 1994 | 88 | 100 | 95 | 61 | 48 | 54 |
| Gambia | 1,042 | 1993 | NA | NA | 76 | 83 | 23 | 37 |
| Ghana | 16,944 | 1994 | 70 | 49 | 56 | 53 | 36 | 48 |
| Guinea | 6,501 | 1994 | 61 | 62 | 62 | NA | NA | 70 |
| Guinea Bissau | 1,050 | 1994 | 38 | 57 | 53 | 32 | 17 | 20 |
| Kenya | 26,391 | 1993 | 67 | 49 | 53 | 69 | 81 | 77 |
| Lesotho | 1,996 | 1994 | 14 | 64 | 52 | 1 | 7 | 6 |
| Liberia | 2,941 | 1994 | 58 | 8 | 30 | 38 | 2 | 18 |
| Madagascar | 14,303 | 1994 | 83 | 10 | 29 | 50 | 3 | 15 |
| Malawi | 10,843 | 1994 | 52 | 44 | 45 | 70 | 51 | 53 |
| Mali | 10,135 | 1993 | 36 | 38 | 37 | 58 | 21 | 31 |
| Mauritania | 2,106 | 1992 | 84 | 69 | 76 | NA | NA | NA |
| Mauritius | 1,057 | 1990 | 95 | 100 | 98 | 100 | 100 | 100 |
| Morocco | 26,945 | 1993 | 98 | 14 | 52 | 69 | 18 | 40 |
| Mozambique | 15,527 | 1994 | 17 | 40 | 32 | 70 | NA | NA |
| Nambia | 1,385 | 1991 | 87 | 42 | 57 | 77 | 12 | 34 |
| Niger | 8,846 | 1994 | 46 | 55 | 53 | 71 | 4 | 15 |
| Nigeria | 105,264 | 1993 | 63 | 26 | 39 | 61 | 21 | 36 |
| Senegal | 7,902 | 1993 | 82 | 28 | 50 | 83 | 40 | 58 |
| Sierra Leone | 4,402 | 1994 | 58 | 21 | 34 | 17 | 8 | 11 |
| South Africa | 40,555 | 1994 | NA | NA | 70 | 79 | 12 | 46 |
| Sudan | 26,641 | 1993 | 66 | 45 | 50 | 79 | 4 | 22 |
| Swaziland | 809 | 1993 | 41 | 44 | 43 | 36 | 37 | 36 |
| Togo | 3,763 | 1992 | 74 | 58 | 63 | 57 | 13 | 26 |
| Tunisia | 8,407 | 1992 | 100 | 89 | 99 | 100 | 85 | 96 |
| Uganda | 20,621 | 1994 | 47 | 32 | 34 | 75 | 55 | 57 |
| Zaire | 39,939 | 1992 | 37 | 23 | 27 | 23 | 4 | 9 |
| Zambia | 9,198 | 1994 | 64 | 27 | 43 | 40 | 10 | 23 |

Water supply and sanitation coverage by region - 1990-1994

| | 1990 (population in millions) | | | | 1994 (population in millions) | | | |
|--|-------------------------------|------------|--------------|------------|-------------------------------|------------|--------------|------------|
| | Total Pop | Pop served | Pop unserved | % coverage | Total pop | Pop served | Pop unserved | % coverage |
| GLOBAL | | | | | | | | |
| Urban water | 1389 | 1145 | 244 | 82 | 1594 | 1315 | 279 | 82 |
| Rural water | 2682 | 1342 | 1340 | 50 | 2789 | 1953 | 836 | 70 |
| Total water | 4071 | 2487 | 1584 | 61 | 4383 | 3268 | 1115 | 75 |
| Urban san | 1389 | 936 | 453 | 67 | 1594 | 1005 | 589 | 63 |
| Rural san | 2682 | 536 | 2146 | 20 | 2789 | 505 | 2284 | 18 |
| Total san | 4071 | 1472 | 2599 | 36 | 4383 | 1510 | 2873 | 34 |
| AFRICA | | | | | | | | |
| Urban Water | 201 | 135 | 66 | 67 | 239 | 153 | 86 | 64 |
| Rural water | 432 | 153 | 279 | 35 | 468 | 173 | 295 | 37 |
| Total water | 633 | 288 | 345 | 45 | 707 | 326 | 381 | 46 |
| Urban san | 201 | 130 | 71 | 65 | 239 | 131 | 108 | 55 |
| Rural san | 432 | 99 | 333 | 23 | 468 | 112 | 356 | 24 |
| Total san | 633 | 229 | 404 | 36 | 707 | 243 | 464 | 34 |
| LATIN AMERICA AND THE CARIBBEAN | | | | | | | | |
| Urban water | 314 | 282 | 32 | 90 | 348 | 306 | 42 | 88 |
| Rural water | 126 | 64 | 62 | 51 | 125 | 70 | 55 | 56 |
| Total water | 440 | 346 | 94 | 79 | 473 | 376 | 97 | 79 |
| Urban san | 314 | 262 | 52 | 83 | 348 | 254 | 94 | 73 |
| Rural san | 126 | 42 | 84 | 33 | 125 | 42 | 83 | 34 |
| Total san | 440 | 304 | 136 | 69 | 473 | 296 | 177 | 63 |
| ASIA AND THE PACIFIC | | | | | | | | |
| Urban water | 829 | 689 | 140 | 83 | 955 | 805 | 150 | 84 |
| Rural water | 2097 | 1108 | 989 | 53 | 2167 | 1690 | 477 | 78 |
| Total water | 2926 | 1797 | 1129 | 61 | 3122 | 2495 | 627 | 80 |
| Urban san | 829 | 513 | 316 | 62 | 955 | 584 | 371 | 61 |
| Rural san | 2097 | 379 | 1718 | 18 | 2167 | 332 | 1835 | 15 |
| Total san | 2926 | 892 | 2034 | 30 | 3122 | 916 | 2206 | 29 |
| WESTERN ASIA | | | | | | | | |
| Urban water | 45 | 39 | 6 | 87 | 52 | 51 | 1 | 98 |
| Rural water | 27 | 17 | 10 | 63 | 29 | 20 | 9 | 69 |
| Total water | 72 | 56 | 16 | 78 | 81 | 71 | 10 | 88 |
| Urban san | 45 | 31 | 14 | 68 | 52 | 36 | 16 | 69 |
| Rural san | 27 | 16 | 11 | 60 | 29 | 19 | 10 | 66 |
| Total san | 72 | 47 | 25 | 65 | 81 | 55 | 26 | 68 |

across Africa killing 14,000 people in over 20 countries. In India and Bangladesh the emergence of a new strain of *V. cholerae* was reported in the 1992 following an initial outbreak in Chennai and followed by another among fishermen on remote islands in the Bay of Bengal. The new strain spread rapidly to China, Malaysia, Myanmar, Nepal and Pakistan involving thousands of deaths - mainly among adults. This is the report of the World Health Organisation 1996.

PATHOGENIC VIRUSES IN FAECES

| Viruses | Diseases | Symptomless Human Carrier | Reservoir |
|-------------------|---|---------------------------|-----------|
| Polioviruses | Poliomyelitis; Paralysis and other conditions | Yes | Man |
| Hepatitis A Virus | Infectious hepatitis | Yes | Man |
| Rotaviruses | Diarrhoea | Yes | ? |
| Echoviruses | Numerous conditions | Yes | Man |
| Coxsackie viruses | Numerous conditions | Yes | Man |
| Reoviruses | Numerous conditions | Yes | ? |
| Adenoviruses | Numerous conditions | Yes | Man |

BACTERIAL PATHOGENS IN FAECES

| Bacteria | Diseases | Bacteria also Excreted in Urine | Symptomless Human Carrier State | Reservoir |
|-------------------------|---------------------|---------------------------------|---------------------------------|--------------|
| <i>Salmonella typhi</i> | Typhoid | Yes | Yes | Man |
| <i>Para typhi</i> | Paratyphoid | Yes | Yes | Man |
| Other salmonella | Food poisoning etc. | No | Yes | Man & Animal |
| <i>Shigella Man</i> | Bacillary dysentery | | No | Yes |
| <i>V. Cholera</i> | Cholera | No | Yes | Man |
| Other | Diarrhoea | No | Yes | Man & Animal |

| | | | | |
|-----------------------|---------------------------------|-----|-----|---------------------|
| Pathogenic E. Coli | Diarrhoea or gastroenteritis | No | Yes | Man (a) |
| Yersini | Yersiniois | Yes | Yes | Animal & Man (b) |
| Campylobacter | Diarrhoea | No | Yes | Animal & Man |

- a) Each serotype is more or less specific to a particular animal host.
 b) Some 30 or more serotypes appear to be associated with particular animal species.

PROTOZOAN PATHOGENS IN FAECES

| Viruses | Diseases | Symptomless Human Carrier | Reservoir |
|--------------------------|--|------------------------------|-----------|
| Entamoeba histolytica | Colonic ulceration amoebic dysentery & liver abscess | Yes | Man |
| Giardia lamblia | Diarrhoea & Malabsorption | Yes | Man |
| Balantidium coli | Mild diarrhoea & colonic ulceration | Yes | Man |

HELMINTHIC PATHOGENS EXCRETED IN FAECES

| Diseases | Common Names | Pathogens | Transmission | Distribution |
|-----------------|------------------------|--------------------------|--|------------------|
| Ascariasis | Roundworm | Ascaris lumbricoides | Man-soil-man | Worldwide |
| Clonorchiasis | Chinese liver flake | Clonorchis sinensis | Animal or man- aquatic snail- fish-man | SE Asia |
| Opisthorchiasis | Cat liver fluke | Opisthorchis felineus | Animal-aquatic snail fish-man | USSR Thailand |

| | | | | |
|------------------------------|------------------------|--|---|--|
| Diphylobothriasis | Fish tape worm | <i>O. Viverrini</i> | Man or animal-copepod-fish-man | Widely distributed mainly in temperate areas |
| Enterobiasis | Pinworm | <i>Enterobius vermicularis</i> | Man-man | Worldwide |
| Fascioliasis | Sheep liver fluke | <i>Fasciola hepatica</i> | Sheep-aquatic snail-aquatic vegetation-man | SE Asia mainly China |
| Fastrodiscoidi- diasis | -- | <i>Gastrodiscoi- coides</i> | Pig-aquatic snail-aquatic vegetation-man | India, Bangladesh, Vietnam |
| Heterophiasis | -- | <i>Heterophyes</i> | Dog/Cat-brackish water snail-brackish water fish-man | Philippines Middle East, S. Europe Asia |
| ----- | | | | |
| Hookworm | Hookworm | <i>Ancylostema duodenale</i> <i>Necator americanus</i> | Man-soil-man | Mainly in worm, wet climates |
| Hymenolepiasis | Dwarf tape worm | <i>Hymenolepis</i> spp. | Man/rodent-man | Worldwide |
| Metagonimiasis | -- | <i>Metagonimus yokogawai</i> | Dog/Cat-aquatic snail-fresh water fish-man | Japan, Korea, China, Taiwan, Siberia |
| Paragonimiasis | Lung fluke | <i>Paragonimus wastermani</i> | Pig/Man/Dog/Cat or other animal aquatic snail or crayfish man | S.E. Asia, scattered foci in Africa & S. America |
| Schisosomiasis; bilharziasis | Schistosome; bilharzia | <i>Schistosoma haematobium</i> | Man-aquatic snail-man | Africa, Middle East India |
| Strongyloidiasis | Threadworm | <i>Strongyloides stercoralis</i> | Man-Man (Dog-man) | Mainly in warm, wet climate |
| Taeniasis | Beef tapeworm | <i>Taenia saginata</i> | Man-cow-man | Worldwide |
| | Pork tapeworm | <i>Taenia solium</i> | Man-pig-man man-man | Worldwide |
| Trichurias | Whipworm | <i>Trichuris trichiura</i> | Man-soil-man | Worldwide |
| ----- | | | | |

DIARRHOEA IN CHILDREN

1. Earliest statistics is from surveys in 9 blocks in 8 states in 1950s in children 6-18 months of age - nearly 40 per cent of deaths were among the children with symptoms of diarrhoea.
2. A longitudinal study of 1091 children 1-4 for age group 21.51/1000 in villages with wells; shigellosis was 8.76/100. The average number of children who had diarrhoeal attacks was 1.5.
3. Diarrhoeal Diseases Control Programme surveys in 11 urban and rural areas in 8 states/UTs during 1985 found diarrhoea per child per year varied from 1.5 to 4.7 in urban areas.
4. About 1.5 million children die annually from diarrhoea (*The Statesman*, New Delhi, dated 23.3.85).

Important protozoa and helminths in India are:-

| | | |
|---|--------------|-----------|
| E | Histolyteca | 1% - 28% |
| A | Limbiocoides | - 41% |
| A | Duodenale | 05 - 600% |
| N | Americana | |
| S | Stecoralis | 5% |
| T | Trichuria | |
| E | Vermicularis | 6% |
| | Giardiasis | 19% |

| | | |
|-----------------|---|--|
| Poliomyelitis | - | estimated 70,000 children a year |
| Cholera | - | about 5000 cases a year - 4,211 cases & 71 death in 1986. - 8.2 m (1986) |
| Gastroenteritis | - | 1.4 m (1986) |
| Typhoid cases | - | about 100/1,00,000 a year |

DR. FEACHEM'S REPORT

Studies conducted by Dr. Feachem of the London School of Health and Tropical Medicine indicated relative importance of alternative

preventive strategies concerning water supply, sanitation and health education. The studies gave a rough guide to the relative importance of the preventive measures considered; excreta disposal 25, excreta treatment 15, personal and domestic cleanliness 18, water quality 11, water availability 18, drainage and sullage disposal 6 and food hygiene 17. The studies concluded that health impact of supplying clean water alone is limited. However, carefully designed programmes which combine water quality with good sanitation and hygiene education have the potential to make enormous difference in the quality of life. A similar study conducted by the All India Institute of Hygiene and Public Health, Calcutta (1944-1953) in its Rural Health Centre at Singur revealed that the number of morbidity and mortality cases due to gastro-enteric diseases and helminthic infection were lowest in the villages where both hand-pumps or tubewells for safe water and pourflush toilets were provided; the next in order were those villages where only such toilet facilities had been made available but those villages had no safe water. The next were those with only hand-pumps or tube-wells and had no toilet facilities and lastly those villages with neither facility.

The obvious fact is that the future of the country largely depends on sanitation which is the most important thing, next to population control. We have to accept this fact in order to raise production and create a clean and civilised society which India has always been. ●

**"Manual scavenging is also
a human rights question."**

Sanitation - the unmet challenge

Fifteen billion years ago, the earth hiccupped and NASA scientists heard the echo the other day. The Big Bang theory may or may not be proved by the US National Aeronautics and Space Administration's Cosmic Background Explorer's satellite (COBE), but it is evident that man has been plundering the good old earth since Adam and Eve decided to wear clothes and make love. The 5.5 billion people living on the earth above water have been recklessly proliferating and consuming avidly the gifts of nature. It has been continuing since time began and the largest and the oldest of structures took shape for humans to live and breathe. But, it seems the limit to growth has been reached now and the earth may split to end in deluge and begin things all over again. The rich countries of the world are so frightened that they called together 50,000 persons from over 100 countries on June 1992 year at Rio de Janeiro in Brazil to find ways of averting this disaster.

To keep the earth clean and livable is a major human responsibility towards the earth. Sanitation, therefore, continues to be a critical component of the environment. Talk of hygiene, health, sanitation, etc., in the same breath as depletion of the ozone layer, global warming, etc. may appear somewhat out of place, but the degradation of the immediate surroundings in which we live should be as important to us as the problem of *global environmental* deficit. There is no other person whom we can blame for the filth and degradation in our micro-environment. And if we do not become conscious of our responsibilities in these matters, the consequences to public health and quality of life can be disastrous.

The garbage-disposal practices prevalent in villages and towns of Indian sub-continent are another indicator of our lack of concern for the cleanliness of the surroundings we live in. Even in areas inhabited by relatively affluent and educated people, dumping

rubbish on the streets and sidewalks is a normal practice. The public roads, they seem to think, belong to nobody and should be treated as garbage bins. If there are garbage receptacles, the places where they are kept soon become the filthiest parts of the street because of lack of concern on the part of those using them, and lack of attention on the part of those who are responsible for maintaining them. Worse, the constant raids on garbage bins by armies of ragpickers, whose numbers seem to be growing unchecked, have made garbage bins more of a health hazard than an aid to cleanliness.

The environment came on the world's agenda after it was discovered that the growth, and a very reckless one at that, has taken place at the cost of nature whose capacity to meet man's needs is limited. Since growth is resource-based, the higher the growth in terms of human consumption, the thinner the support-line to sustain it. Population, mostly in the Third World countries, doubled during the last thirty years and the frightful technologies to exploit nature's resources diminished the possibility of human civilization lasting forever. The infrastructural facilities like water supply, safe disposal of human waste, solid waste and waste water disposal are not able to keep pace with the growth of population. Due to rapid urbanisation, nearly half the population in towns live in slums, pavements and shanty townships. Their health and physical well-being are threatened by inadequate sanitation. They are the ones who suffer most from the vicious cycle of ill-health, lowered productive capacity and hardships in



Sanitation is a critical problem in slums

a deteriorating environment. The women and children are the worst sufferers. Sanitation has many linkages, most important among them being water supply and safe and hygienic disposal of human waste. Sanitation broadly covers human excreta, waste water, solid

waste and even personal hygiene, housing, etc.

Insanitation has wide-spread effects; water sources get polluted, incidence of diseases rises, affecting billions of people all over the world, labour force is affected, productivity of industry and agriculture falls putting stresses on



City slums

budgetary resources needed for development and strengthening the economy. Invariably people who are unserved with basic facilities of water supply and sanitation are the poor ones. They lack not only the means to have such facilities but also information on how to minimise the ill-effects of insanitary conditions in which they live. Poverty breeds disease and disease breeds poverty. High rate of child mortality encourages couples to have more children, resulting in increase in population.

Politicians, captains of industry and economic pundits who gather to chant the fashionable mantra of economic reform seldom mention that such reform is incomplete without reforms in education, health and sanitation status. Industrial growth in countries like China, Malaysia and Thailand is, in considerable measure, due to heavy investment in primary healthcare, sanitation and education. And the population conference in Cairo has only reconfirmed that the best way to combat fertility rates is providing the primary healthcare to mothers and children and primary education to girl children.

Of the many things that will make a sizeable difference in the pace of development and raise production, clean living condition is very important. Sanitation is a basic condition for development, an input to raise production. Or all that is sought to be gained through economic reform will be lost for want of toilets. ●

Why sanitation fails

Sulabh realised that alongwith improvement of sanitation, elementary health education is necessary. Most people, especially the poor, are not aware of health and environmental benefits of improved sanitation. Their priorities are different. Latrine is not a felt-need for them. They are also not aware of the availability of affordable technological options. General awareness and community's involvement in the social programmes develop self-reliance and confidence in the community. Sulabh has set up primary healthcare centres at some of the community toilets where health and hygiene education is given to slum-dwellers.

Women are the worst sufferers due to non-availability of these facilities. Because of absence of latrines in their houses, women have to go out in the open either before sunrise or after sunset to defecate in darkness. Hence, toilets are of great priority for them for reasons of privacy and safety. Women have by far the most important influence in determining household hygiene and in forming habits of children. Motivating people to use latrines by itself is not sufficient to promote sanitation. Health and hygiene education has to be sustained over a long period of time. It is in this area that voluntary organisations with involvement of women as facilitators and catalysts can play a crucial role. They will be better equipped to ensure community participation for providing benefits to the people than are possible in other set-ups. Sulabh has trained a large number of women in urban slums. Sanitation has suffered largely because of the following reasons.

LACK OF POLITICAL WILL

First perhaps we have not adequately communicated to our political leaders the dimensions of the problem and resources it would take to solve the problem. We have not emphasized to them how rapid population increase is causing us to fall increasingly behind. Poor sanitation has not been translated into the human and economic losses it causes: unnecessary child illnesses and deaths, wasted years of schooling, lost years of work and wasteful expenditure on curative measures. We have not convinced decision-makers sufficiently that disease breeds poverty and poverty breeds

disease and that high rates of child mortality encourage couples to have more children. Perhaps we need to work on creating the political will to put greater resources for sanitation and that requires more commitment than we have shown until now.

SANITATION IS NO CAREER

Second, sanitation is not a popular topic at any level of society. It is not attractive as a profession. Who wants to say he specializes in the disposal of human excreta? The technology is not highly sophisticated and, therefore, is unappealing to engineers who graduate with impressive qualifications. How many political leaders get elected by promising latrines? How many departments of water supply and sanitation or ministries of health have clean, usable toilets?



Woman is central to social reforms

The topic of sanitation is uncomfortable and taboo, and we have not yet seen that the challenge is to break through these cultural barriers in order to lower the burden of disease. As additional problem may be that we tied sanitation to water supply, hoping that water supply, which appeals more, would pull along the sanitation. We have failed to realize, however, that while providing improved water supplies may take only a year, improving sanitation involves a new behaviour that it may take a generation. It requires research on local beliefs and practices, culturally appropriate hygiene education, extension workers trained in two-way communication and years of sustained effort. Are we trying to combine two activities that actually have different time-frames?

POOR PROMOTIONAL TECHNIQUES

A final point on where we are going

wrong is probably in the area of sanitation promotion in the area of sanitation promotion techniques. If there were ever an area that needed the expertise of social marketing, it is the area of sanitation. We must convince political leaders as well as communities. Yet few national programmes consult marketing firms to sell the idea of sanitation or even to do consumer research. Few programmes employ social scientists or health educators or try to understand obstacles or to create demand. To obtain funds for sanitation, we have tied it to water supply rather than convincing decisions-makers that it needs funds in its own right. At the community level, we have believed that if we would have told the people and showed them, they would have bought the product. Such programmes relied upon demonstration and message-giving, rather than marketing and community participation aimed at meeting the expressed needs and preferences of the people. The field of sanitation promotion offers the water and sanitation sector many challenges. We must first ask ourselves. If we truly believe sanitation should be a priority public health measure, if the answer is "yes" then we must find ways to accomplish the goal.

NO HYGIENE EDUCATION YET

Second, isn't it high time to give greater emphasis to hygiene education? Improved sanitation requires behavioural changes that could take several years to bring about. Hygiene education requires understanding community belief, values and practices, training extension workers in two-way communications, and innovative educational methods suited to the culture such as comics and participatory techniques. It also requires focusing on key behaviours and recognizing that small improvements are better than no improvements at all. In some communities hygiene education coverage rather than latrine coverage will be the goal, and it alone can contribute to reductions in disease. More importantly, our efforts at hygiene education should be relentless and should focus on children and bringing about cultural change.

CULTURAL BARRIERS

Third, we should try to break through as many cultural barriers as possible so that all levels of society can talk freely about the urgent need for better advantages to their lives and livelihood. We recognize that we need political support from the highest levels to create more appropriate waste disposal methods and to

support hygiene education. For this we need stronger involvement of social scientists and health educators to take part in the promotion of sanitation and hygiene. Marketing of sanitation could also create a demand for sanitation at the community level. Once there is a demand, private enterprise will seize the opportunity. Sanitation work should be liberalised, private companies, NGOs and others should take up sanitation work as is done in the West. Let multinational Indian companies emerge to keep our cities clean and people productive. Civic bodies should gradually phase out giving way to private initiative.

NEED TO INVOLVE WOMEN

Fifth, as women worldwide are largely responsible for home economics, sanitation and personal hygiene of children, we should make a special effort to involve women more seriously than before in promoting sanitation, in design, and in decision-making. The role of the entire community is being seen as crucial in promoting sanitation. Wouldn't promotion be stronger if the community saw the collective importance of each household contributing to a reduction in the risk of disease? Many non-governmental organisations have been extremely successful in sanitation coverage including Sulabh International. Engineers need to see the challenge of treating human excreta as valuable resource rather than as an obnoxious, dangerous waste product. Dry latrines that turn human excreta into a valuable manure need not be regarded as a second need to be reserved for the poor, but a first-rate solution for households and communities that for environmental reasons need to conserve their water resources and reduce their dependence upon chemical fertilizers. Engineers should be rewarded for innovations and new designs through career promotions.

MARKET SANITATION

Fourth, should we invite marketing experts to help us convince policy-makers of the public health and economic importance of sanitation achieving improvements in community sanitation and every effort should be made to encourage and support their participation in this effort. The Sulabh Movement is a step in that direction. But only one step which is also very necessary to take in order to travel a thousand miles. Dr. Pathak started on his odyssey in 1970, moneyless. Now, Sulabh has about 50,000 people with him, working round the clock

to serve the people in a manner not many did before. It may be proposed that some unemployed youths should be trained as motivators and masons at the district and block levels. They should carry out this programme as social entrepreneurs. In the beginning some element of subsidy say Rs. 500 per latrine may be necessary to encourage the beneficiaries to get the sanitary latrine constructed in their houses. However, the amount will not be given to the beneficiaries, rather, it should be given to the institutions which construct them. The same methodology has been adopted in urban areas. The nationalised banks may be instructed to give loans to individuals for the construction of sanitary latrines at a low rate of interest.

To motivate and persuade the people to have sanitary latrines in their houses, mass media should be utilised in the same way as in the Family Welfare and other programmes. Voluntary organisations should be involved in the motivation, awareness, education, implementation, maintenance and follow-up to make the programme successful.

MAKE IT A MOVEMENT

The objectives of the Water Supply and Sanitation Decade can only be achieved through a massive programme of basic service for all, rather than for a few. More than Government programmes, what is really needed is a national movement to popularise pourflush latrines. Such a movement will gain considerable momentum because of the social dimensions which will aim at eradicating manual scavenging in the country and liberating millions of people from having to perform their ablutions in the open. In the absence of such movement our campaigns for a cleaner habitat cleaner and better cities or villages will not succeed.

SNAGS IN THE SYSTEM

Low-cost sanitation system, however, is not very attractive for engineers who have been educated and trained in high tech. Any engineering work which is grand and which can earn applause attracts them. Thus, piped water supply system or sewerage is their natural choice. Less technical men are attracted to the construction aspects of sewerage systems. Most of them are, therefore, indifferent to low-cost sanitation. Big contractors are not interested in taking up the

construction of LCS. They prefer to go in for works where the margin of profit is high. The NGOs also feel hesitant in taking up this work due to difficulty in finding a suitable and willing workforce. Experienced and trained persons, including the masons, leave the job of implementing the LCS and shift to other kinds of construction where the payments are more lucrative and prospects are better. This applies to Junior Engineers and Assistant Engineers too. Since pourflush toilets are to be constructed in individual houses, each toilet becomes a project by itself. As the construction has to be done at the convenience and to the satisfaction of the house-owner and the work is scattered all over, the labour and material inputs increase. Due to low turnout, low chances of wastage of materials and labour and a close watch by the house-owner, the margin of profit is reduced considerably.

GIVE INCENTIVE

The financial assistance made available to beneficiaries should be such that they could afford to have toilets in their houses. It has been observed that in many states, the rate of interest and the retiring period for the loans advanced to beneficiaries make the loan repayment instalments too high to be affordable by most people. It results in non-repayment of loans. Till now all the households, irrespective of their income, were getting 50 per cent subsidy and 50 per cent loan to cover the full cost of the toilet, up to sub-structure level in most states. The Government of India has now curtailed the subsidy and has related it to the income level of the household.

The beneficiaries have also to contribute from 5 to 25 per cent of the total cost from their own resources. It has become a problem for most people to spare the money in one lumpsum, which they could have paid in instalments. Most people who do not have toilets or dry privies, are poor. For them, sanitary latrines is not a felt need; they give priority to other necessities of life like food, clothing, shelter, etc. A latrine gets very low priority as they are not aware of its importance and need. It has been observed that most of the latrines provided in rural areas with 100 per cent subsidy from the government are not used; instead the latrine cubicle is used for other purposes. This happened because the programme was not supported by software inputs like sanitation education, motivation, publicity, communication etc.

LEGAL SUPPORT

The Technology Advisory Group of the World Bank had suggested adoption of bye-laws on sanitation in the feasibility report prepared by it on cost-effective sanitation in order to give legal support for expeditious implementation of the programme. The Government of India has also circulated these bye-laws to be adopted by civic bodies. But most of them have not so far adopted them. It is also observed that where such laws are available, enforcement is not possible due to public resistance. Mere formulation of law is not an end; it is equally important to enforce it by making available the alternative to bucket privies and open-air defecation which is affordable, acceptable and easily available. It has been found that at times when a bucket privy is to be converted, it becomes necessary to construct a new one at a more suitable place which needs a superstructure. Many of the households cannot afford to build it from their own resources, resulting in the continued use of bucket privies. Similarly, a large number of toilets constructed in houses having no latrines are not used because there is no superstructure. Most such houses belong to the poor who have no means to build superstructures.

CONSTRUCTION PROBLEM

It is very bothersome and time-consuming to run about and get the necessary approval of drawings, sanction of grant/loan from the local authority, arranging labour and materials and supervising the construction. Though people may be willing to have pourflush toilets, all these problems prevent them from getting the latrine constructed. They will be happy to have an agency take the entire responsibility from the application stage to completion of toilet, including guarantee of the structure and its functioning. The householders also need education on use and maintenance of PF toilets. The local authorities and the government departments do not have the necessary infrastructure to carry out this job. Only NGOs who have experience in the field are best suited. There is a large section of people in every town in whose homes there is no space for providing a toilets. For them, the only feasible alternative is properly maintained community latrines. Due to lack of resources, the local authorities are unable to construct community latrines in adequate numbers and even the existing ones are not

maintained properly; with the result, most people prefer to go for open defecation rather than use the community latrine. Most states do not have provisions in their budgets or plan for providing financial assistance to local authorities for constructing, operating and maintaining community toilets.

PROMOTE RURAL SANITATION

Jawaharlal Nehru had said: "The day every one of our country men and women gets to use a toilet, I shall know that our country has reached the pinnacle of progress." In rural India people generally defecate in open space, little knowing the consequential health hazards, effects of open defecation like cholera, gastroenteritis, ring worm, hookworms, diarrhoea, dehydration, higher percentage of morbidity and mortality among the infants, etc. due to socio-cultural heritage, tropical climate, illiteracy, etc. Bushes and trees have been removed, the land has been converted into agricultural fields and hardly any place is left to hide for open defecation. People specially women are worst sufferers and they have to wait from dawn to dusk for the natural call. Late Prime Minister Mrs. Indira Gandhi stressed the necessity of latrines for the rural communities in India, particularly for women. In June 1982, she addressed a letter to the Chief Ministers of states mentioning "... another problem is that of latrines in rural areas. With the consolidation of land holdings and expansion of towns as well as cultivated areas, people in villages have great difficulty in this regard. Women specially feel miserable. They can go out only at night time which is not always safe. I have spoken on this matter to some Chief Ministers. The State Government should take up a programme of building latrines where these are not available or get local organisations to take an interest. This needs urgent attention".

COST-EFFECTIVE APPROACH IS 'MUST'

It is, therefore clear that sanitation movement in India has been an attempt to provide cost-effective toilet systems, in individual houses and in common areas. This is also necessary because laying sewerlines is very expensive and our rivers have no capacity to carry the sludge and wastes thrown into them. Nor is possible to set up sewage treatment plants. The fact is that between an expensive

sewerage system and the open-field defecation lies a whole new improved system of low-cost sanitation whose effectiveness is proved beyond doubt. Researchers and scientists both in India and abroad have concluded that safe disposal of human excreta can bring about maximum improvement in sanitation and environment. The All India Institute of Hygiene and Public Health, Calcutta, said in an investigation survey carried out at the Singur Research Centre that the mortality and morbidity rates were higher in villages with only tubewell water supply facilities than where only low-cost pour-flush toilets had been provided. The best results were observed where both the facilities were available and the worst consequences are seen where none was present. Health statistics of the country also reveal that excreta-related diseases cause the highest number of deaths.

History reveals that household privies were not suited to the culture and tradition of this country in the past, and, therefore, they were not an essential feature of Indian households. Defecation direct on to the soil was a matter of habit and convenience. This practice has social and cultural acceptance also. The primary objective of public health engineers in converting traditional service latrines into water flush toilets has environmental hygiene and protection of the community against health hazards. Although almost the most Five-Year Plan allocation for urban sanitation have been spent on the sewerage system, ongoing or new, yet there are hardly 217 towns and cities with sewerage at present. And none of these sewerage schemes covers the entire municipal city area, leave alone the adjoining suburbs. In most towns and cities, even in the streets where sewers have been laid, houses have not been connected in spite of municipal laws making it compulsory for such connection; people do not have money to do that, or they do not want to spend it in one lump sum for the conversion; thus, insanitary conditions continue.

Another difficulty is the operation and maintenance of sewerage system. After the introduction of sewerage in the town, local authorities levy sewerage tax to which there is opposition because everybody has to pay it, whether one has a sewer connection or not. The maintenance cost of sewerage cannot be met from the tax. The rate, however, cannot be increased as it is beyond the capacity of the common person to pay higher taxes. Due to the general budgetary constraints, local authorities are unable to maintain the sewerage system even with subsidy; no wonder sewers are getting choked for lack of proper cleaning and maintenance. Since all the houses on a street are not connected, the household waste

water, along with some waste from the streets, is let into the sewerage. Discharge of such waste and soil, and insufficient water for lack of house connections, is resulting in the blockage of sewers, making many of them defunct. The large sums of money spent on sewerage have thus become wasteful expenditure. A sewerage project has to be completed substantially before even a portion of the completed work can be made use of, whereas with individual on-site systems for each house, this difficulty is not encountered. One of the advantages of a pourflush system is that the maintenance is not a burden on the local authority. The content to be taken out of the pit every three years is safe for handling and can be taken out by any labourer as it is dry, and odourless like earth. The return from the sale of the sludge are more than the cost of the labour. Low-cost sanitation (LCS) has the advantage that in case budgetary constraints, the work can be stopped or slowed down and the work completed can be used and people derive the full benefit which is not so in the sewerage system.

ON-SITE DISPOSAL ONLY SOLUTION

Sewerage and septic tank systems are not at all the solutions in rural areas due to prohibitive cost of construction and maintenance. The only affordable alternative to stop open-air defecation would be the two-pit pourflush toilet system. The cost of construction of Sulabh Shauchalaya depends on the beneficiary to choose a particular design according to one's resources. As stated time and again, only two litres of water is required for flushing; it prevents air pollution, human excreta gets converted into manure and it does not need the services of the scavenger to clean. Any person can take out the manure and use it in the field directly.

The community latrines in rural areas should be discouraged as these are capital intensive and their maintenance is costly. Hence, it would be worthwhile to promote individual latrines in rural areas and community latrines in urban and semi-urban areas. However, two to four seated public toilets may be constructed in schools, *anganwadis*, health centres, panchayat bhawans and community centres for people to use and also get motivated to adopt this system in their houses. The community latrines at the block development office, market yards and bus depots may be recommended. It is also desirable to provide two-pit pourflush toilets along with the Indira Avas Yojana or other housing schemes in rural areas. It may, however,

be not possible from the public exchequer to provide funds for the construction of sanitary toilets in all the individual houses. In rural areas, there are two types of clientele who want to have sanitary latrines in their houses; one who are well-off and secondly those who live in the urban areas but visit villages occasionally. They want to have latrines for their convenience. But infrastructure is not available to assist them for the motivation and construction of the toilets.

India faces a formidable task of meeting the health and sanitation needs of 950 million people. The Government alone cannot handle the situation. The NGOs can work as a link and catalytic agents in bringing about a harmonious interaction between the Government and community by mobilising people's participation. As an NGO and a non-profit social service organisation, Sulabh has set up a successful model in India for on-site human waste management for improving the quality of life. ●

**The best way to solve housing
problem is to stop building houses;
provide only sites and services.
And the people will build houses
themselves. - Turner and Magin**

Habitat and poor sanitation

There are, in fact, two "cities" in one city; one for the poor and another for the rich. The population boom and the concentration of wealth have created a cleavage in society which is split into two. Consequently, the poor are thrown out in city slums, where they live in subhuman conditions. And, that makes it necessary to take a fresh look at the problem of urban housing. The urban areas in the Third World are being swamped by slums, growing faster than the planned part of the city. Earlier, the problem was not so grave because there was not much to gain by living in cities and the wealth production centres were scattered all over the country. Now, it is estimated that the population in the cities of the Third World countries will increase by a million every week. Post-War rural-urban migration of the 1950s gave rise to middle and low-income housing projects. This migration was the result of developmental and constructional activities after the destruction caused by the War and the newly independent colonial countries.

Parallel to this planned growth of urban centres came the influx of the poor in search of jobs into urban areas and the slums began to expand menacingly. By 1970, as many as 30 to 50 per cent of major Third World urban centres were slums. The search for alternative strategies by planners like Abrams, Turner and Magin suggested that the best way to solve housing was to stop building houses and just provide *site-and-services* and see people build just what they want and what they can afford. Thus, began the concept of the *site-and-services*, a strategy for promoting low-income housing. Some Third World countries like India, Peru, Indonesia and Turkey were also among the first to take up slum upgradation as a strategy to solve the urban low-income housing problems. These strategies of the *site-and-services* projects and slum upgradation schemes were more on ad hoc basis than research based revolutionary ideas, going to the roots of the

problem. Mr. Ram Madsagar, an expert, has studied this problem under the Indo-Dutch collaboration scheme of the Human Settlement Management Institute of HUDCO for solving the urban low-income housing problem. The first research conducted in 1986 related to testing the hypothesis of promoting low-income housing by stopping house building and providing simply the site and services. For this purpose, five JJ resettlement colonies were selected in New Delhi.



"Sanitation in India is not only cleanliness; it is also an end to humiliation and miseries of scavengers who carry human excreta on the head."

- Indira Gandhi

SITE-AND-SERVICES SCHEME

The survey revealed that up to 60 per cent of the beneficial group for whom the site-and-services scheme was intended to provide resettlement, sold away their plots. The more well-to-do among them had purchased one or more of the adjoining 25 sq yards plots and built houses that cost up to Rs. 1.2 lakh. Thus, there is a progressive downward displacement, eliminating the intended beneficiary and replacing them by the more well-to-do. Most slum dwellers, who were allotted plots, have sold their land and returned to slums again. A low-income colony by definition should have shown a reasonable equality in income and wealth of residents. Yet another research has revealed that even in a poor man's locality, there exists the same contrasting picture of income and wealth distributions as seen in cities, big and small. This shows that site-and-services concept for housing the poor has failed, though it is good in theory.

Only a small number of the originally intended beneficiaries continue to resist the forces of displacement and, to that extent, effort had been perhaps worthwhile, but the process of displacement continued while the problem of



A site-and-service map in the making.

poor man's housing keeps on aggravating with both displaced persons from low-income housing and the continuing influx of rural urban migrants competing in urban slums. The second question was the commercial viability of low-income housing projects. It is quite obvious that the low-income housing projects cannot be made commercially viable because the precious urban lands have such a high premium that even in a highly subsidised state, there is extremely poor cost recovery and the cost-recovery machinery cost more than the recoveries of ground rent fixed for the poor man's plots. In older colonies, ownership has changed and the government system does not recognise this reality with the cost-recovery machinery chasing the original beneficiary. For instance, a good part of Delhi is sold in benami deals but the Government does not recognise it. And, the original beneficiaries still continue to figure in official records.

For both, poor and the rich, urban life is like a journey through space and time – it is a "Spatio-tempora"; urban land is not a place to build a home and live, but just a place to "journey" to work and get back to a house for night's rest. We have seen the classic example in Bombay; in industrial area like Parel where privately owned multi-storeyed single room tenements are turned into three-tier dormitory class rented for eight hours in three shifts. The worker has a home in village where his family lives and where he spends short vacation, periodically. This is the beginning of a home in the city concept. The Japanese built pigeonhole class dormitory accommodations to compress people's

rest into growing urban space-time continuum. If these trends are any indication of the future, then perhaps we can plan for a home in the village or suburb for every poor and a dormitory class community rest place during work week in the urban space-time. The concept has been developed on a multi-storeyed multi-purpose community dormitory system that can function as a day school for poor children, community recreating during holidays and evening and night rest at affordable price. The civic authorities try to help the urban street squatters in winter by providing schools and vacant godowns for night rest. The community dormitory concept emerges as a solution to shelter for the urban houseless, but this is not housing.

VANISHING SMALL TOWNS

The growth of city centres and the diminishing importance of small towns are the main reasons for inflows into big cities which are choking. The growing slums, unplanned colonies, absence of adequate services, encroachment on public land and open spaces, increasing inefficiencies of the civic staff – all these factors and more constitute the ugly face of urbanisation in India. The principle manifestation of growth is the degeneration of old city areas, a negation of planning in the rise of modern colonies and the most uncontrolled growth in peripheral areas. In new towns, specially those which have grown as a result of growth of large-scale industries in backward areas, urbanisation is almost co-terminus with total absence of planning and infrastructure, necessary for the growing industries surrounded by huge slums.

Whether we talk of established towns with a traditional economic base or of new towns which have thriving industries, we are referring to



A group of women discussing site plans

settlements which are wealthy. In other words, towns such as Bombay or Calcutta and new towns such as Korba and Singraule are centres which create wealth and possess resources. The investment in the industrial infrastructure of these towns runs into thousands of crores of rupees. The investment in power, transportation, telecommunication, etc., is also very high. What seems to be lacking is both public and private investment in providing the supporting facilities in cities and towns. Even in a township like Noida, near Delhi, where there is huge industrial base, very little income accrue to the authorities for the maintenance of civic facilities. In fact, the situation is funny. The resources base of all local bodies are in inverse proportion to the resources base of the city.

The problem can be looked at from two angles. The first relates to the new industrial towns which are emerging, both out of location-specific industries and out of the attraction of industries to go to backward areas because of the concessions offered to them. Such areas have little or no urban infrastructure and certainly no management system for handling urban problems. Land is allotted by government or its agencies to industries at throwaway prices with added attraction of the infrastructure to service the industry made available at little or no cost at all.

IMPOVERISHED CIVIC BODIES

A handsome package of incentives such as power subsidy, capital subsidy, interest subsidy, easy availability of raw materials, tax concessions, etc. are offered to them. The result is that while the industry is housed handsomely, and equipped with the most modern machines, there is no investment in townships. The result is that while industry grows, township degenerates. In new towns, land is provided generously at low cost so also infrastructure facilities, including link roads. Later, after the infrastructure services are laid and industries set up, there are no funds for their maintenance. It is invariably the case with new towns that have come up during the past twenty years when the unplanned growth of towns was most stunning. Therefore, the question is how to raise resources for the maintenance of civic facilities and other services.

One way is to raise the price of land in new towns and make one-time provision for the maintenance of services by investing in

industries. The other way is to raise taxes and ensure the funds at fixed intervals. Both the solutions pose great problems. Raising the land price will be cruel because the prices are high in most towns and cities already. And, taxes cannot be raised in new towns because there are not many people and industries to pay. Yet another way is to encourage industries to pay for the development of towns. This is also not possible, for these units are brought to backward areas on concessions and subsidy. And, they say they are not able to compete in the market because of high production cost. Essentially, there are two types of economic activities which bring pressure on civic facilities. The first relates to the industries which are obsolete and sick, incapable of contributing substantially to municipal revenues but still reasonably attractive to unskilled labour from rural area. The second are new industries and other business which are in large cities because of the advantage of the existing infrastructure without contributing at all to its improvement, enlargement or maintenance.

MAINTAIN SANITATION SERVICES

| VITAL SIGNS | THE TOP TEN |
|-----------------------------|-----------------------------|
| CITY (metropolitan area) | POPULATION (in millions) |
| Tokyo | 26.8 |
| Sao Paulo | 16.4 |
| New York City | 16.3 |
| Mexico City | 15.6 |
| Mumbai | 15.1 |
| Shanghai | 15.1 |
| Los Angeles | 12.4 |
| Beijing | 12.4 |
| Calcutta | 11.7 |
| Seoul | 11.6 |

(Source : United Nations Population Division; 1995)

The existence of such infrastructure is taken into account while costing the project for profitability. Such activity must also be tapped because it causes an increase in city population, exerts greater pressure on the civic facilities and also generates slums. There has to be some token contributions by business houses towards city improvement, largely in the form of decoration of road roundabouts, setting up Sulabh toilets, etc. To meet these expenses, it is advisable to: (1) impose heavy tax on

business in city centres, (2) tax rebates, going all the way up to 100 per cent for investment by business in housing, development of infrastructure within a given locality, construction and maintenance of schools, hospitals, (3) tax rebates on assistance

given by industries and other business units to their employees for constructing private or cooperative houses, and (4) tax incentives for locating residential colonies of workers outside the municipal limits, developing them properly and providing communication and transport facilities. And, making it mandatory for business units to set up sanitation facilities, especially Sulabh toilets in slums.

To be sure, the decay of our cities is wholly because of our sheer unwillingness to move in the matter. Growth of slums has political background also. And, when the tragedy like the Bhopal gas leak takes place, planners again give the appearance of wonder and amazement which is wholly pretended. The bulging cities and towns, festering slums and crowded pavements are some of the many signs of urban decay which has marked the industrial growth of the country during the past 20 years. It has happened all over the world, specially in the countries which have painfully switched over to an industrial culture. But, in India, it is phenomenal, almost impossible to manage or contain the crisis created by urban explosion. Much of the problems faced by big cities are preventable because they have been caused by the rich who want to live in big cities to be near the seat of power, political and financial and to be able to advance their prospects as well as those of their business firms. This is where all the big jobs, contractors' orders, markets expertise, permits, licences and finance are available. Their wives want to move around in the social world of the metropolis. They have sons to settle in good jobs and daughters to marry off. They need the presence of a large number of rich and spending people among whom they can also flaunt their wealth. By merely, living in big cities, one acquires property whose escalated value may be more than the earning of one's lifetime. A flat in Bombay or Delhi, bought under some subsidised

Get Involved

 **Habitat for Humanity**



scheme, may fetch what is more than the total asset of a family. The increasing price of real estate is another allurements for the rich and enterprising people to move to large cities.

In consequence, the poor and resourceless are constantly pushed out of the main city areas to live in slums. In the 12 metropolitan towns whose population increased to 42 million from 30 million a decade ago (a rise of at least 40 per cent), at least half the people have no access to even public toilets. About 60 per cent are not served by sewers. Only 217 of the 3,245 towns in India have underground sewerage of sorts, that too not for the entire towns. As the cities expand, the distance between the home and work place lengthens. The average for Bombay is 17 km while for Delhi it is 15 km. People travel between 50 to 120 km to reach their work places and back home, spending 4 to 6 hours a day is travelling alone. In rain, the slums float on water. In large areas, piped drinking water is a rarity. If at all it is there, there may be a tap for 200 families. The average space occupied by a slum family is 4.33 persons in 133 sq. ft. in Bombay. At places, one finds 12 persons living in a 180 sq.ft. tenements or huts made of bamboo mats. Patients lie on the floor; schools function in shacks, in stinking lanes with no open space for children to stretch their legs.

RICH-POOR DIVIDE DEEPENS

In posh colonies, the poor don't go except for work. Even rich families do not allow their servants, even female ones, to use their bathrooms. They defecate in the open or in street corners and dirty the place. The main space in city centres have been kept open to create more space for elitist flats or work places. In Delhi, such privileged colonies are there for all to see. The encroachers include political high-up and influential people. No wonder, tension is building up between the rich and the poor. For the rich, metropolis is where the money lies and the poor go there in search of jobs. The rich need the services of the poor like automations and not as a living and feeling persons who have some claims on public resources. This way, the slums continue to expand and the poverty continues to grow. These are the cities that came too soon, but a large number of others describe such cities as engine of growth and refuge of the jobless, being flushed out from the countryside after being made surplus. They bring

their poverty with them and seek a meagre living in metropolitan cities. Conditions in most major urban conglomerations in India are much the same. In the cities like Bangalore, Delhi, Bombay and Calcutta, where the population has increased by 50 per cent in ten years, it may be worse. The population growth in the last ten years in major cities was: Jaipur 60 per cent, Pune 50 per cent, Ahmedabad 45 per cent, Delhi 44 per cent, Hyderabad 43 per cent, Bombay 33 per cent, Madras 34 per cent, Calcutta 30 per cent and Bangalore 76 per cent (data base 1994).

One reason for the haphazard growth of cities is the flawed job policy. One has to see a place like the *Nariman Point* in Bombay to know how to destroy a city. Working under the pressure of contractors and builders, the government has allowed the city to grow quite unrelated with its capacity to provide facilities like sewerage system, water supply, housing and other things. The administration comes under the pressure of builders and contractors who build houses and apartments that leave no breathing space, as it were, between the buildings, specially the high-rise ones, each of which accommodates something like 20,000 people. And, these people work there adding to the already heavily burdened facilities.

OLD CITIES ON RIVER BANKS

Most cities in olden days were built along river banks for assured supply of water. This does not seem to be the case now. Cities and towns are growing in a line stretching over hundreds of miles, say along railway lines or main roads, without concern for water supply or anything else. The fact is that Delhi is getting ready for the year 2001 when its population would be in excess of 12 million people, half of them houseless and almost all ill-supplied by basic facilities like adequate and safe drinking water and the sewerage system. Besides the failure to control population, (which is one factor that has cancelled all gains), wrong policy for industrial expansion, housing, job creation, providing facilities like good educational centres, communication etc. and other factors have combined to create urban chaos.

The only way to avert the crisis is to freeze the growth of 12 metropolitan cities of the country and also to freeze the land sale and industrial expansion. It should be declared that the government

alone can buy and sell land which will bring down land prices. And, large companies should be made to build quarters for their employees. If these steps are taken, prices will come down with a thud and industries will start moving out to other smaller towns where necessary incentives should be provided to them. And, the facilities, including good educational centres, should be set up. This does not involve money; for private schools are ready to invest and set up such facilities. Why should students from, say Bihar and Kerala, must come all the way to Delhi only for education? Why not the so-called most modern educational centres be set up there. Let the institute like Jawaharlal Nehru University or its branch be set up in all states.

CHANGING HABITAT AND EMERGING NEW CULTURE

Culture and habitat are key to the understanding of human society; the nexus between the two is quite intimate. By and large, human activities are conditioned by physical factors, characterising the habitat. Habitat helps shaping the way of life in a big way. Knowledge of the surrounding environment goes a long way in interpreting the state of culture in a society. The environment provides valuable clues to interpret variability in culture. Culture is, in fact, "enmeshed with its natural surroundings". It is maintained that "natural resources, climate and accessibility are the stuff of which industry, trade, religion, national policy and, to some extent civilization, are made of".

Contrary to the convictions of the "environmental determinist", habitat, it is said, cannot explain the cultural variations. The cultural variations in the identical environmental conditions go against the simplistic notion of habitat being the sole or crucial factor affecting culture. Similarly, identical ways of life under conditions of varying natural endowments also refute the deterministic role of habitat. There are elements within culture that are indifferent to the physical environment. "Between the physical environment and human activity, there is always a middle term, a collection of specific objectives and values of a body of knowledge and belief; in other words a cultural pattern". It is naive to interpret culture as the crude manifestation of forces in physical conditions and natural resources. Social setting is an autonomous reality, not entirely dependent upon physical reality. The students of culture trying to explore "the interaction between

ways of life of a people and the scene in which these ways are brought into being" are reported to have rejected the crucial importance of habitat accorded by environmental deterministic so far as shaping of culture is concerned.

The relationship between culture and habitat is complex. There is continuous give and take. If culture has a tendency to depend on the physical conditions, the latter is also amenable to manipulation by the former. Interplay, mutuality and reciprocity between the two produce diverse constellations. This explains the existence of a large variety of ways in which human beings have responded to the requirement of basic survival. Habitat's influence on culture is neither singular nor comprehensive. Elements of

culture, too, are highly selective in locating the elements of physical endowments for their assault. Resources presented by the natural world are shaped to meet existing needs, while inborn traits are so moulded as to derive out of inherent endowment the reflexes that are preponderant in overt manifestation of behaviour which is largely determined by habitat. Habitat influences, culture, habits, social values, life pattern and everything else. In simpler words, habit is yet another name of civilization.



Civic facilities are mostly limited to posh colonies

No wonder ancient civilizations, including Indus, Egyptian, Assyrian and Babylonian, were marked by well planned houses. Techniques of disposal of human excreta are indicative of the stage of cultural development. In primitive agricultural societies, the techniques were simple and open defecation was the practice. In such a situation, there seemed to be direct relationship between culture and habitat. Low density of population, availability of open places for defecation gave rise to social orientation in favour of defecating in the open. Physical endowments tended in such

circumstances to influence the culture of sanitation.

Thus, ancient rural India did not have an enclosed place for defecation inside the house. Women also used secluded places either surrounded by trees or covered in part by crops of raised ground. The night-soil thus deposited on the surface of the earth got converted into soil without creating the problem of disposal. With the coming in of modern civilization, provision for specific places either inside or outside the house was made for defecation.

It was only after the emergence of towns, big cities and industrial areas during the Mughal period, and which got further impetus during the British period, that the problem of human waste disposal acquired urgency. It is to be noted that growing awareness for improved sanitation has led to adoption of a number of steps in the post-Independent India. Improvement in the living conditions through better sanitation provisions have received importance in the national policies as well as programmes of the international agencies. ●

Poor sanitation costs lives

Sanitation related diseases are the number-one cause of death for children in poor countries while even the rich nations are no exception to the global epidemic of violence against women. The United Nations Children's Fund has launched its 1997 Progress Of Nations Report revealing that 'sanitation related' diseases are the major cause of child mortality in the country while AIDS continues to impact infant mortalities. "Diarrhoea, pneumonia and malaria are the major causes of child death," said Unicef Representative, Nancy Terreri, who added that due to the spiralling HIV and AIDS epidemic "child mortality rates have also increased by three per cent".

This year's (1997) annual report also focused on the appalling proportion of violence against women and girls around the world. The report noted that although most African countries have law against sexual harassment, none are in place to protect women from female genital mutilation, marital rape, domestic violence and insanitary conditions.

"More than 60 million women that should be alive today are 'missing' due to violence associated with gender discrimination," Ms Terreri said. "Millions more in every country, on every continent and every class live under the daily threat of physical abuse." Deputy Prime Minister Hendrik Witbooi, who officiated at the launch, emphasised that the report was a challenge to all participating nations.

"Again we see that violent crimes against women are underestimated and the resulting cases of rape and violence against women and children in developing countries are a testimony to the above statement. We must insist that violence against women and children are not the status quo but intolerable," said Witbooi.

Despite the staggering data, however, many developing countries received high marks for preserving children's rights by imposing life-skills training instead of jailing young offenders with adults.

"Both the report and today's (worldwide) launch in London

commended poor countries efforts to divert juveniles from the criminal justice system... and ensure that children's rights are protected even if they come into conflict with the law," Terreri said. She added that such efforts "hold the greatest potential for reaching international standards for Namibian children".

The Progress of Nations Report annually ranks nations according to headway made in addressing issues that affect the welfare, health and rights of children. Terreri stressed, however, that the report contained some data on Namibia that was outdated by as much as five years. Recent achievements in children's health - such as 90 per cent immunisation coverage for polio and tetanus, the elimination of iodine deficiency and a sharp increase in clean water availability - were also highlighted by Terreri. Citing flagrant violations of international codes by 32 companies who continue to push harmful infant formulas over breast feeding, Terreri pointed to another potential milestone for poor countries. ●

Rome was the pioneer in sanitation campaign.

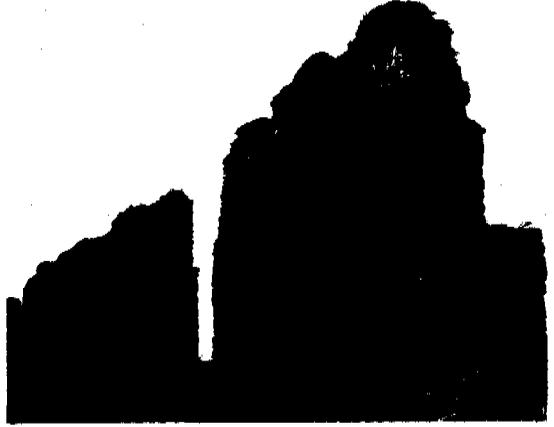
Romans did it first

Ancient Romans are famous for their intricate bath and aqueduct systems. But some may not know that the Romans invented the first flush toilets. From an early date, sanitation and public health drew the attention of statesmen. The most magnificent sewer, the Cloaca Maxima, was constructed in the 2nd century B.C. Water distribution systems and sewers had considerable impacts on daily life. Cities made baths and latrines available to residents. Public latrines were quite communal: they were rooms lined with many toilets along each wall. In the ancient city of Pompeii, which a volcanic eruption preserved in 79 A.D., the public latrine was in a secluded spot. Under supports of stone against the wall were wooden seats, while underneath a sewer received and carried away the refuse to the main sewer. As the distance in hierarchy between slaves and the wealthy increased, latrines appeared in private houses. These were still designed to accommodate more than one person, usually there were two holes (so the Saturday Night Live sketch wasn't pure fiction). Toilets were supplied with a water flush that emptied directly into the vaulted sewer in the neighboring street.

Not to be forgotten are the famous Roman aqueducts. Unlike those of the Egyptians and Babylonians, which were underground, Roman aqueducts consisted of a row of arches supporting the channels along which water flowed downhill from mountains to cities. Romans distributed water to individual homes. Fourteen aqueducts supplied water to Rome itself, and there were many others throughout the Roman Empire.

One of the Roman's main amusements was their daily visit to the public baths, which were rather like modern-day shopping malls. In the baths were rooms for athletic games, libraries, and vending areas. The baths themselves were extremely sophisticated. There were three pools: warm, hot, and cold, which one entered successively to get the full bathing experience. If there were naturally occurring hot springs, Romans built baths around them.

If not, air was heated by a hypocaust, a system whereby hot air from a furnace circulated under the raised floor through ducts and vents in the walls to heat the water. Wood and charcoal, which slaves supplied, fueled the furnace. Romans built huge reservoirs near the baths to provide a plentiful supply of water.



A section of the aqueduct in ancient Rome

With the fall of the Roman Empire and the onset of the Middle Ages, many of the advancements the Romans had made in sanitation were lost. It was not until the mid-19th century that luxuries which the Romans appreciated thousands of years ago again became common. ●

Paris was a garbage heap before it became the dream city of the world.

Paris: Urban sanitation before the 20th Century

A History of Invisible Infrastructure

Built on the ruins of the Roman city of Lutecia, Paris was officially founded in 360 AD. Its evolution was defined by a succession of fortified walls that surrounded its ever expanding territory well into the 19th Century.

Since ancient times, the basic rule for dealing with Parisian garbage was "tout-a-la-rue" - all in the street - including household waste, urine, faeces and even fetuses. Larger items were frequently thrown into the "no-man's-land" over the city wall or into the Seine. Feces, however, was often collected to be used as fertilizer. Parisian dirt streets easily assimilated the refuse thanks to frequent rain and heavy pedestrian and cart traffic. The edible muck was often consumed by pigs and wild dogs, and the rest was consumed by microorganisms. The smell of the rotting matter was terrible but by no means the only contribution to the odors found in Paris.



The history of waste treatment in Paris was not unlike those of other major industrialized cities. Response to the accumulation of refuse generally occurs when problems become too urgent to ignore. Paris's enormous production of urban refuse – household and manufacturing garbage, human and animal excrements, human corpses and animal carcasses – produced gradual solutions in the form of cesspools, gutters, waterworks, sewers, street cleaning ordinances, fountains, garbage collection, dumps, bathhouses, bathrooms, street urinals, sewerage farming, composting, mass graves, cemeteries and catacombs, intertwined and influenced by the political and philosophical ideas of the times. This site will tackle four waste management topics – sanitation, sewerage, garbage and corpses – in chronological order starting with the medieval times and ending with the end of the 19th century, when most of the current waste management methods were implemented.

(Source : Timeline Bibliography)

WHO fact-sheets on water and sanitation

(Up to November 1996)

- ◆ Every eight seconds a child dies of a water-related disease. Every year more than five million human beings die from illnesses linked to unsafe drinking water, unclean domestic environments and improper excreta disposal.
- ◆ At any given time perhaps one-half of all peoples in the developing world are suffering from one or more of the six main diseases associated with water supply and sanitation (diarrhoea, ascariis, dracunculiasis, hookworm, schistosomiasis and trachoma). In addition, the health burden includes the annual expenditure of over ten million person-years of time and effort by women and female children carrying water from distant, often polluted sources.
- ◆ Nearly a quarter of humanity still remains today without proper access to water and sanitation.
- ◆ During the International Drinking Water Supply and Sanitation Decade (1981-1990), some 1600 million people were served with safe water and about 750 million with adequate excreta disposal facilities. However, because of population growth of 800 million people in developing countries, by 1990 there remained a total of 1015 million people without safe water and 1764 million without adequate sanitation.
- ◆ Overall progress in reaching the unserved has been poor since 1990. Approximately one billion people around the world still lack safe water and more than two billion do not have adequate excreta disposal facilities. Rapid population growth and lagging rates of coverage expansion has left more people without access to basic sanitation today than in 1990.
- ◆ Another problem with coverage goals is the magnitude of resources needed to achieve them. At the Global Consultation of Safe Water and Sanitation for the 1990s, held in New Delhi in 1990, it was stated that universal coverage by the year 2000 would require US\$ 50 billion per year, a five-fold increase in current investment levels.
- ◆ In 1992, WHO concluded its monitoring of the Decade with the

estimate that a total of US\$ 133.9 billion had been invested in water supply and sanitation during the period 1981-1990, of which 55% was spent on water and 45% on sanitation. Urban areas received 74% of the total and rural areas only 26%. Contrary to widespread perceptions, almost two-thirds of all funds were provided by national sources and only a third by external organizations.

- ◆ WHO estimates that it costs an average of US\$ 105 per person to provide water supplies in urban areas and US\$ 50 in rural areas, while sanitation costs an average of US\$ 145 in urban areas and US\$ 30 in rural areas.
- ◆ Water supply and sanitation can be viewed as a process having three interactive elements. The most fundamental of these elements is the availability of safe drinking water and sanitary means of excreta disposal. This means 20 to 40 litres of water per person per day located within a reasonable distance from the household. Safe water implies protection of water sources as well as proper transport and storage within the home. It also means facilities for bathing and for washing clothes and kitchen utensils which are clean and well-drained. Sanitary excreta disposal is the isolation and control of faeces from both adults and children so that they do not come into contact with water sources, food or people. To break the transmission chain of faecally-related diseases, good standards of personal and domestic hygiene, which begin with handwashing after defecation, are essential.
- ◆ A second element in the water and sanitation development process is the use and care of water and sanitation facilities. People must use these facilities properly to obtain the health benefits inherent in them. This means knowing how to protect and store water safely, how to maintain personal and domestic cleanliness, how to care for excreta disposal facilities and how to avoid or minimize unsanitary environmental conditions. Knowledge transfer, behaviour change and personal responsibility are the key factors.
- ◆ The third of the interactive elements is the institutional support from the communities, developing agencies and government policies that provide a framework for water and sanitation improvements. Experience has shown that community-based efforts, whether in a small village or a large metropolis, are

most effective in identifying and meeting peoples' needs. Governments, especially at the regional and national levels, are more effective as facilitators of the development process than providers of water and sanitation improvements.

- ◆ Water contaminated by human, chemical or industrial wastes can cause a variety of communicable diseases through ingestion or physical contact:
- ◆ *Water-borne diseases*: caused by the ingestion of water contaminated by human or animal faeces or urine containing pathogenic bacteria or viruses; include cholera, typhoid, amoebic and bacillary dysentery and other diarrhoeal diseases.
- ◆ *Water-washed diseases*: caused by poor personal hygiene and skin or eye contact with contaminated water; include scabies, trachoma and flea, lice and tick-borne diseases.
- ◆ *Water-based diseases*: caused by parasites found in intermediate organisms living in water; include dracunculiasis, schistosomiasis and other helminths.
- ◆ *Water-related diseases*: caused by insect vectors which breed in water; include dengue, filariasis, malaria, onchocerciasis, trypanosomiasis and yellow fever.
- ◆ No single type of intervention has greater overall impact upon the national development and public health than does the provision of safe drinking water and the proper disposal of human excreta. The direct effects of improved water and sanitation services upon health are most clearly seen in the case of water-related diseases, which arise from the ingestion of pathogens in contaminated water or food and from insects or other vectors associated with water. Improved water and sanitation can reduce morbidity and mortality rates of some of the most serious of these diseases by 20% to 80%.

**ESTIMATES OF MORBIDITY AND MORTALITY OF
WATER-RELATED DISEASES**

| Disease | Morbidity (episodes/year, or as stated) | Mortality (deaths/year) | Relationship of Disease to Water Supply and Sanitation |
|---------------------------|--|------------------------------------|--|
| Diarrhoeal disease | 1,000,000,000 | 3,300,000 | Strongly related to unsanitary excreta disposal, poor personal and domestic hygiene, unsafe drinking water |
| Infection with intestinal | 1,500,000,000 | 100,000 | Strongly related to unsanitary excreta disposal, poor personal and domestic hygiene |
| Schistosomiasis | 200,000,000 | 200,000 | Strongly related to unsanitary excreta disposal and absence of nearby sources of safe water |
| Dracunculiasis | 100,000 | -- | Strongly related to unsafe drinking water |
| Trachoma | 150,000,000 | -- | Strongly related to lack of face washing, often due to absence of nearby sources of safe water |
| Malaria | 400,000,000 | 1,500,000 | Related to poor water management, water storage, operation of water points and drainage |
| Dengue Fever | 1,750,000 | 20,000 | Related to poor solid wastes management, water storage, operation of water points and drainage |
| Poliomyelitis | 114,000 | -- | Related to unsanitary excreta disposal, poor personal and domestic hygiene, unsafe drinking water |
| Trypanosomiasis | 275,000 | 130,000 | Related to the absence of nearby sources of safe water |
| Bancroftian filariasi | 72,800,000 | -- | Related to poor water management, water storage, operation of water points and drainage |
| Onchocerciasis | 17,700,000 | 540,000 | Related to poor water management in large scale projects |

Source: WHO data

WHO update on declining environment

- ◆ Diseases caused by environmental degradation kill one in five children before age five in the poorest areas of the world, according to international health experts.
- ◆ Worldwide, almost one-fourth of disease was linked to environmental factors of poor water and sanitation, indoor and outdoor air pollution, and vector-borne diseases, according to a report by the United Nations, the World Bank and the World Resources Institute, a Washington-based think-tank.
- ◆ Vector-borne diseases are spread by insects and rodents.
- ◆ Malaria, diarrhea, cholera, pesticide poisoning, and respiratory infections from air pollution contributed to 11 million childhood deaths a year, the report said.
- ◆ The report identified the world's poorest areas as much of sub-Sahara Africa and parts of Asia.
- ◆ "This report amasses credible, convincing evidence that environmental deterioration is not a marginal, but a major cause" of human disease and death, Gus Speth, administrator of the U.N. Development Program, said at a news briefing.
- ◆ While Speth said the report's information on the link between the environment and human health "is not dramatically new, it is the extent, the pervasiveness, the scope that is shocking."



The report found the following:

These mud houses have no latrines which is the cause of insanitary condition

- ◆ Almost 4 million children die each year from acute respiratory infections linked to indoor pollution from smoky cooking fires and other sources, and from outdoor air pollution.
- ◆ 1 million to 3 million people, mostly children, die from malaria, a mosquito-borne disease linked to environmental conditions.
- ◆ 2.5 million children die from diarrheal disease linked to bad drinking water and other environmental conditions.
- ◆ As many as 3.5 million to 5 million people in developing countries each year suffer acute pesticide poisoning from lack of protection during application, and millions more are exposed to dangerous levels of the toxic chemicals.
- ◆ With the growing gap between the world's rich and poor, the report found a widening "health gap" in which preventable diseases were concentrated among society's poorest.
- ◆ In rapidly industrializing countries, it said the poor might face a dual threat from a lack of adequate sanitation, housing and food, as well as new threats of toxic chemicals and



WORST OF BOTH WORLDS: Neither water nor sanitation

fumes from industries and transportation.

- ◆ The poor would also suffer disproportionately from effects of global warming, caused by the accumulation of gases in the atmosphere from burning fossil fuels, which have so far come mostly from richer countries, the health experts said.
- ◆ The report showed that human health effects of global warming were already occurring with increases in deaths from vector - and water-borne diseases, as well as deaths from more severe storms, flood, heat waves and other weather maladies, said Robert Watson, the World Bank's director for environment.
- ◆ "This report shows the social and economic costs of not protecting the environment are much greater than the costs of protecting it," Watson said.
- ◆ Each year, 6 million hectares of productive dryland turns into worthless desert. Over three decades, this would amount to an area roughly as large as Saudi Arabia. More than 11 million hectares of forests are destroyed yearly, and this, over three decades, would equal an area about the size of India. Much of this forest converted to low-grade farmland unable to support the farmers who settle it. In Europe, acid precipitation kills forests and lakes and damages the artistic and architectural heritage of nations; it may have acidified vast tracts of soil beyond reasonable hope of repair.

(Up to May, 1998)

Progress of mankind is the result of a
search for the unknown - *J.M. Maxwell*

Areas of research & development Collaborations with other agencies

Sulabh's work has been evaluated by many international agencies, including UNDP, World Bank, UNICEF and WHO. Sulabh has tied up with many agencies for research and project work, including WHO, UNDP, ODA (Overseas Development Agency of the British Government), BORDA, SIDA (Danish International Development Agency), DANIDA (Danish International Development Agency), KFW (Kreditanstalt Fur Wiederaufbau, German Development Corporation), EEC (European Economic Community). The Netherlands Government also funds low-cost sanitation projects in many States in India. Sulabh is working in the neighbouring countries like Nepal, Bhutan, China, Pakistan and Bangladesh. It has also taken up many programmes in collaboration with the UN Centre for Human Settlement, Nairobi; and the International Water and Sanitation Centre, Loughborough University of Technology, (UK), through the Water Engineering and Development Centre (WEDC). As indicated earlier too Sulabh International is closely working in collaboration with international agencies like WHO, UNICEF, UNDP and national agencies like NBO, CBRI, HUDCO, Ministries of Welfare, Urban Development and Rural Development, Government of India, All India Institute of Hygiene and Public Health, Calcutta, etc.

Sulabh International has worked as a Consultant on a number of World Bank assisted projects either independently or in collaboration with Engineering Services (India) Pvt. Ltd. (CES). Some projects pertain to the collection of data and information on the status of rural water supply and sanitation development in seven states of India, laying down criteria and guidelines for selecting villages and districts to be included in the Integrated Rural Water Supply and Environmental Sanitation Project in Uttar Pradesh, identification of low-cost sanitation alternatives for Madras city, and low-cost sanitation for the Trivandrum (Kerala) Sewerage and Sanitation Improvement Project. Sulabh,

at present, is engaged in consultancy in collaboration with CES on: (i) Low-Cost Sanitation under Environmental Sanitation Programme in Madras and the adjacent urban areas; (ii) Low-Cost Sanitation Kozhikode Sanitation Planning Area; and (iii) Community Awareness, Environment and Health Education Studies in Madras.

The Sulabh International Institute of Technical Research and Training (SIITRAT), founded in 1984, provides technical back-up to Sulabh in the fields of low-cost on-site sanitation system, biogas generation from human waste (public toilets) and vegetable wastes, etc. In 1989, the Institute, as mentioned earlier, was shifted from Patna to New Delhi. It got its own registration under the Societies Registration Act 1993 and permission under Foreign Contribution Regulation Act in 1997 by the Ministry of Home Affairs, Government of India. The Institute is engaged in the development of new and sustainable technologies, their implementation, demonstration and dissemination, training and consultancy in the fields of low-cost sanitation, low maintenance waste water treatment, solid waste management, environment and pollution, etc. The areas of its activities include research and development in the fields of low-cost sanitation and biogas technology for overall environmental improvement. It studied the performance of different types of biogas plants in varied situations in Bihar at the request of Ministry of Non-Conventional Energy Sources, Government of India. Presently, it is working for optimum utilisation and techno-economic evaluation of human excreta and other mixed wastes based biogas plants to ensure effective waste disposal and harnessing of bio-energy. Study on Indo-German collaborative project in low maintenance waste water treatment system is being carried out in Delhi. Study and research were carried out for optimising the low-cost sanitation technology and on pollution of ground water and soil likely to occur from on-site sanitation near Calcutta with radio isotope tracers in high sub-soil water level areas.

DUCKWEED-BASED WASTE WATER TREATMENT SYSTEM

The major problem with waste water on-site treatment method is that no viable technology is available. The sewerage technology is unaffordable due to high implementation and maintenance costs. This is the reason why India has hardly 230 towns/cities having such technology out of about 4,800 towns and cities.



Duckweed-fed fish farming in duckweed treated waste water

Sulabh has taken up research-cum-demonstration project on duckweed based low-cost waste water treatment in rural as well as urban areas with good income from pisciculture. Although duckweed is found in abundance, due to absence of know-how of any such technology in the country, capacity

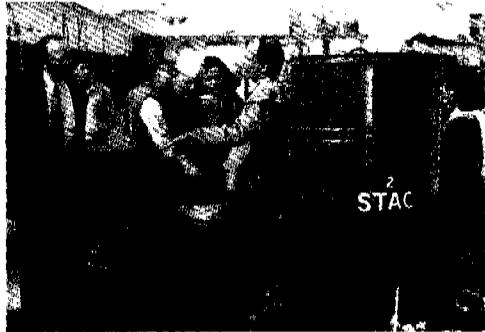
and potential of duckweed for the waste water treatment, its nutrient value and economic benefits have not been exploited.

Duckweed - a small free floating and fast-growing aquatic plant - has enormous ability to reduce BOD, COD, suspended solids, heavy metals and even toxic elements and bacterial and other pathogens from the waste water. It is a complete feed for fish and owing to high content of proteins and vitamins A and C, is highly nutritious for poultry and animals. The yields of fish increases two to three times when fed with duckweed than that of natural feeds in ponds. Sulabh has demonstrated in collaboration with the All India Institute of Hygiene and Public Health, Calcutta, and Institute of Public Health Engineers, Calcutta, three such projects, one each funded by the Central Pollution Control Board, Delhi; Ministry of Rural Areas and Employment, Government of India; and the Danish International Development Association (DANIDA). The study would help provide a low-cost technology which would not only treat waste water but also give good return on investment. It would encourage small and medium towns to take up waste water treatment and improve the environment and health status of the people. Besides, it would provide good employment avenues in rural as well as urban areas.

SULABH THERMOPHILIC AEROBIC COMPOSTER

During recent years, disposal of solid wastes has been ever an increasing problem, causing serious health hazards and

environmental pollution. Composting is an important method of biodegradable solid waste management having good return by way of manure and soil conditioner. One of the important limitations with the composting technology is that it requires not less 35 days, making it difficult to implement in towns where large amount of garbage is produced every day. Further, manual handling during



Dr. Pathak talking to Mr. Kent Cooper Bureo, Senior Correspondent of *The Washington Post*, about composting of vegetable waste

composting to turn garbage, makes it unhygienic and cumbersome. Sulabh International Institute of Technical Research and Training has developed a new technology under the guidance of Dr. P.K. Jha, Advisor Technical, which requires only 5-6 days to make compost from any biodegradable wastes without manual handling during composting. The technology is based on thermophilic and aerobic method. During composting the temperature inside composter rises upto 65-70°C. At high temperature degradation of wastes by thermophilic bacteria takes place quickly and pathogens are eliminated from the wastes. The practical utilities of this technology are: (i) organic solid waste will be efficiently converted into manure and soil conditioner having direct/indirect economic return, (ii) it will control diseases transmitted from wastes because at high temperature pathogens are eliminated from the wastes, (iii) the dumping fee of wastes will be drastically reduced, (iv) it will extend life of landfills, and (v) it will control weed spread from wastes.

LOW-MAINTENANCE WASTE-WATER TREATMENT SYSTEM (LOMWATS)

There is a technological gap between simple waste water treatment like septic tanks and large-scale often highly mechanised and sophisticated waste water treatment system. There is need for decentralised and low- capital and low maintenance waste water treatment. The low-maintenance waste water treatment system

comprises sedimentation, anaerobic fermentation, aerobic degradation, percolation and absorption by plants. SIITRAT has been working to construct and monitor the efficacy of pilot domestic waste water treatment plants from housing colonies, hospitals, schools and other institutions. This R&D-cum-demonstration of LOMWATS project is funded by the European Union Commission and executed in collaboration with: (i) Bremen Overseas Research and Development Association (BORDA), Germany, (ii) Chengdu Energy Environment International Corporation (CEEIC), China, (iii) Hangzhou Research Institute of Energy and Environment (HRIIE), China, and (iv) Group Energies Renouvelables et Environnement (GERES), France.

BIOGAS FROM HUMAN EXCRETA

The Institute has been the pioneer in the field of generation and utilisation of biogas from public toilet complexes. After a series of experiments, under the following projects, funded by the Ministry of Non-Conventional Energy Sources, Government of India, the



Public toilet-linked biogas plant with the gas-holder

Institute developed a new and effective design of biogas plant which has been approved by the same Ministry for implementation through its State nodal agencies with subsidy from the Ministry. (1) Techno-economic evaluation of human excreta-based biogas plants for community use and evaluation of plant designs,

process control and pretreatment of feed stock for optimisation of and standardisation for mixed feed, and (2) Demonstration and evaluation of slurry effluent as manure from large size human excreta biogas plants for agricultural purpose.

Based on this design, 68 of biogas plants have been constructed in different states of the country so far. Per day biogas production capacity of these digesters varies from 30 to 60 cum. Human excreta based-biogas technology remained unnoticed for long due to the fact that available technology was not socially acceptable as it required manual handling of human excreta which contains a full spectrum of pathogens. The design developed by Sulabh International Institute of Technical Research and Training does not require manual handling of human excreta and there is complete recycling and resource recovery from the wastes. Digester is made underground into which excreta from public toilets flows under gravity. Inside digester biogas is produced due to anaerobic fermentation by the help of methanogenic bacteria. The biogas, thus produced, is collected over water in a separate gas holder or inside digester itself, depending upon the design of the digester. Per user per day one cft biogas is produced. Human excreta based biogas contains 65-66 per cent methane, 32-34 per cent carbon dioxide and rest hydrogen sulphide and other gases in trace amounts.

Biogas is utilised for cooking, lighting through mantle lamps, electricity generation, body warming during winter, etc. Cooking is the most efficient use of biogas. Biogas burners are available in a wide range of capacity ranging from 8 cft to 100 cft biogas consumption per hour. Biogas mantle lamp consumes 4-5 cft equivalent to 40W electric bulb and 220 volt. Motive power can be generated by using biogas in dual fuel internal combustion (IC) engine. Air mixed with biogas is aspirated into the engine and mixture is then compressed, raising its temperature to about 350°C which is self ignition temperature of diesel. Biogas has high (600°C) ignition temperature.

Therefore, in order to initiate combustion of the charge, a small quantity of diesel is injected into the cylinder just before the end of compression. The charge is thus ignited and the process is continued smoothly. At optimum condition only 20 per cent diesel is required, rest (80 per cent) is substituted by biogas. Biogas consumption by engine is 15 cft/BHP/hour. A public convenience used by about 2,000 persons per day would produce approximately 60 cum of biogas which can run a 10 KVA genset for 8 hours a day, producing 65 units of power. Such electricity is being supplied from dawn to dusk around the famous Gandhi Maidan Patna (Bihar). Similarly, at the bus

stand Ranchi (Bihar) electricity from biogas is being used to illuminate this public place. (see chapter 'Areas of major initiatives')

REDUCTION OF PATHOGENS AND OTHER POLLUTION PARAMETERS

Human excreta contains a full spectrum of bacterial and other pathogens transmitting, as mentioned earlier, more than 50 types of diseases and causing over 80 per cent sickness in a developing country. Some of the commonly found bacterial pathogens are *Escherichia coli*, *Salmonella* sps, *Shigella* sps *Vibrio cholerae*, *Streptococcus* sps, etc. Reduction of bacterial pathogens during anaerobic fermentation of human excreta has been studied by this Institute. The studies have revealed that depending upon the bacterial species up to 90-100 per cent pathogens are eliminated in the effluent at 30 days HRT (hydraulic retention time) of the digester. Similarly, protozoa and helminths are also eliminated. Biogas plant helps to reduce pollution load significantly. Physico-chemical characteristics of effluent show substantial reduction in the total solid, volatile solid, COD and BOD over these values in feed material.

BIOGAS FROM DRIED WATER HYACINTH AND OTHER MIXED FEEDS

Water hyacinth is an aquatic, seasonal and problematic weed of national concern. However, it has an advantage that it is a good substrate for biogas generation. The Government of India constituted a Task Force to get rid of this weed. Since this weed is seasonal, biogas plant based on this feed becomes non-functional during summer due to unavailability of this weed. This organisation has successfully demonstrated that biogas can be produced from this weed throughout year after harvesting it, drying and pulverising. The pulverised weed can be easily transported and used for biogas generation throughout year. The Institute has also carried out a series of experiments on biogas generation from vegetables/fruit wastes and household kitchen wastes with or without using human wastes. Better results were obtained when human waste and vegetable waste were fed in combination. It showed an additive effect.

POURFLUSH WATERSEAL TWO-PIT LATRINES

The concept of pour flush water-seal twin pit latrine popularly now known as Sulabh Shauchalaya was developed much before by Dr. Bindeshwar Pathak, Founder, Sulabh International Social Service Organisation, than the Institute (SIITRAT) was established. However, this Institute has developed a number of models of Sulabh Shauchalayas based on locally available materials and to suit people of different economic strata. The Institute has carried out experiments on migration of different pathogens from pit in soil. The studies conducted in collaboration with the All India Institute of Hygiene and Public Health, Calcutta, have revealed that there is no chance of ground water pollution from Sulabh Shauchalaya if hydraulic load of the pit is kept for two to three litres of water per use. The pan and water-seal are so designed that this much amount of water is sufficient to flush out excreta. In conventional pan and trap about 10 litres of water is required to flush. There is slight modification of the design of Sulabh Shauchalaya especially in case of rectangular pits that prevents flows of water from the pit in-use to the next pit.

The Institute has also carried out a series of experiments on the percentage viability of different pathogens in the pits with respect to retention time of human wastes. The studies have revealed that there is near complete absence of pathogens from digested sludge of the pit when taken out after two years of resting period. Sometimes cysts of helminths persist at this period. When the sludge is sun-dried for 2-3 weeks it becomes free from all these pathogens. The dried and granulated manure is odourless and completely free from pathogens. The Institute undertakes the construction of household Sulabh Sauchalayas in Delhi and adjoining states, through its well trained staff. The major difficulty in use of human excreta as manure is the presence of bacterial and other pathogens. Human excreta contains a full spectrum of pathogens, causing various infections. It should be free from pathogens before being used as manure.

MANURE FROM HUMAN EXCRETA

Another problem is psychological and religious taboos. The studies carried out by this Institute have revealed that contents (excreta) of Sulabh Shauchalaya pit is almost free from pathogens when taken out after two years of resting period. To make it completely

pathogen free digested sludge is sun-dried for 2 to 3 weeks. During drying, sludge forms big lump like making it difficult to mix in soil homogeneously. The Institute has developed a technology to granulate such dried lumps into small size graded granules which look like processed tea leaves. Before granulating, it is processed in a ball mill to break into small pieces. Then it is passed through the mass mixer where moisture content of manure is regulated by adding water. Such manure has good percentage of plant nutrients. Besides, it increases humus and water holding capacity of the soil. The institute has carried out experiments to see its manurial effects on different vegetables and flowering plants. In all the tested cases, effect of manure was very much encouraging.

VERMI-COMPOSTING

Vermi-composting is an important method for composting vegetable wastes. The method is more suitable for rural areas. This Institute has successfully demonstrated the technology. Vermi-compost has comparatively higher nitrogen content. One of the important drawbacks of this system is slow process. The Institute is engaged in minimising the time requirement by enhancing the growth rate of vermiworms.

CONSULTANCY SERVICES

In order to assist the State governments, local authorities, other organisations and institutes in drawing up project reports for implementation of low-cost sanitation, water supply and biogas production from human waste in rural as well as urban areas; and to give technical guidance and advice to various state offices of Sulabh International Social Service Organisation, its founder Dr. Bindeshwar Pathak established a Consultancy Division at Delhi in the year 1986. This unit is now a part of the Sulabh International Institute of Technical Research and Training. For the preparation of detailed project reports on low-cost sanitation following steps are taken:

- Study the existing sanitation facilities and the plan proposals of the local government for introduction of sewerage, population and area served;
- Study the existing and planned water supply system, population served and water use pattern;

- Evaluation of the on-going latrine programmes;
- Selection of most appropriate and cost effective low-cost technological option depending on
 - geological and hydrogeological features;
 - physical features of the area, land use, density and number of persons in the household;
 - demographic features of the area;
 - socio-cultural habits and customs, behaviours, beliefs and attitude relating to sanitation;
 - house-to-house survey to study the present sanitation status in the households and to know the family size, drinking water source, availability of electricity, type of latrine/no latrine in the household, availability of space for construction of latrine and leach pits (within the premises and out side the premises), income/expenditure of the household and willingness to pay for the construction of toilet in the household; and
 - assessing the need and site selection for community toilets.
- Study of affordability, acceptability, availability and awareness,
 - based on this study the communication support activities are designed;
- Preparation of designs, drawings and cost estimates;
- Suggesting measures and precautions for pollution control;
- Suggesting an appropriate methodology for construction of Sulabh Shauchalayas (twin pit pour-flush toilets) and Sulabh Shauchalaya Complexes (community toilets with bath, laundry and urinal facilities);
- Identification of suitable institution for implementation, study of the availability, capability and capacity of local institutions
 - governmental, non-governmental and private - to implement low-cost sanitation; suggesting a proper marketing and delivery system including assessing training and monitoring needs and suggestions to give legal support to the programme, assessing the staff requirement for the operation and maintenance of community toilets;
- Discussion on financial issues including funding of the project, financing pattern, loan/grant administration, loan recovery and merits of operating the community toilets on pay and use system;
- Operation and maintenance;
- Suggesting an appropriate implementation plan; and

- Training and rehabilitation of liberated scavengers and their wards.
- While designing the Sulabh Shauchalaya complexes, architectural features are closely examined. Traditional architectural features of the town are adopted and efforts are made to blend them with the surrounding area.
- Landscape is done to make the complexes aesthetically attractive. Plantation of ever green trees and shrubs are proposed to create shade for the users and to act as a buffer zone between the complex and surroundings.

GANGA ACTION PLAN

As indicated earlier, Sulabh International Institute of Technical Research and Training has been involved in the prestigious project – Ganga Action Plan for prevention of pollution of river Ganga. It has prepared project reports for constructing Sulabh Shauchalayas and Sulabh Complexes for the cities of Allahabad, Kanpur, Varanasi, etc. in U.P.; Patna and Bhagalpur and few other towns in Bihar. The total value of works for which the projects were prepared under Ganga Action Plan comes to about Rs. 14 crores. The implementation of these projects has been done by Sulabh. The Institute is at present actively engaged in the National River Conservation Project of Government of India. For the Government of the Netherlands assisted environmental improvement project of Kanpur and Mirzapur under the Ganga Action Plan, the Institute had collaborated with the Netherlands based consulting firms (*Haskoning and Euroconsult*) in preparing project reports on low-cost sanitation.

LOW-COST SANITATION PROJECTS

The Institute has prepared detailed project reports on low-cost sanitation for a number of towns to make them scavengers free by conversion of bucket privies to Sulabh Shauchalayas and construction of new ones in houses where there were no latrines. The projects also included construction of Sulabh Shauchalaya Complexes for commuters, floating population, rickshaw pullers, pavement dwellers and for such households which do not have space for individual latrines or cannot afford to have them. Schemes for training and rehabilitation of liberated scavengers and their



Mr. John M. Kalbermatten, Senior Adviser with the World Bank in Washington, (fourth from right) on a visit to Sulabh campus, New Delhi

wards formed an integral part of these projects. It has also prepared projects for establishing training facilities for the liberated scavengers and their wards in Assam, Rajasthan, Madhya Pradesh, Maharashtra, Tamil Nadu, Manipur, Tripura, Punjab, Arunachal Pradesh and Uttar Pradesh.

The Institute has prepared a number of projects for construction, operation and maintenance of community toilets with bath, laundry and urinal facilities for various authorities like municipal corporations, municipalities cantonment boards, railways, etc.

WORLD BANK STUDIES AND PROJECTS

The World Bank sought the assistance of Sulabh International Institute of Technical Research and Training to collect data and information on the status of rural water supply and sanitation development sector in seven states in India. At the request of Government of Uttar Pradesh, the Institute prepared a report to lay down criteria and guidance for selecting villages and districts to be included in the Integrated Rural Water Supply and Environmental Sanitation Project of Uttar Pradesh under the World Bank assistance. At the request of the Royal Government of Bhutan, the Institute prepared detailed project reports for construction, operation and maintenance of community toilets with bathing and urinal facilities on 'pay and use' system at Thimphu (capital of Bhutan) and Phuntsholing. Similarly a project for construction, operation and maintenance of community toilets at Kathmandu, Nepal was also prepared.

EVALUATION AND STUDY

At the request of the HUDCO, the Institute carried out evaluation study of low-cost sanitation programme in Madhya Pradesh. The Human Settlement Management Institute (HSMI) of HUDCO in collaboration with the Institute of Housing and Urban Development Studies (IHS), Rotterdam took up a Government of Netherlands assisted collaborative project, "Capacity Building for the Urban Environment: A Comparative Research, Training and Experience Exchange". Experiences obtained through the research study on the operational strategies of best practices for urban environmental management was presented in Habitat II - the Second UN Conference held at Istanbul in June 1996. At the request of HSMI, Sulabh International Institute of Technical Research and Training carried out a research-cum-case study on "Integrated Low-Cost Sanitation: Indian Experiences" to provide insight on capacity building into environmental management examples of best practices with potential of its scaling up and wider replication. ●

**Don't give power to a man whose
impulse to punish is great.**

- Nietzsche

Dialectics of power

- Sulabh networking system

Power has been central to the making of human history; it is the cause and consequence of follies, absurdities and disasters recorded abundantly in books. The need for power rose when human beings ceased to be good to each other. Thomas Paine says: "*Society is created by our wants and the government (power) by our wickedness*". Society pre-dates the state which emerged to regulate human interests identifiable in terms of ethnic groupings, economy, geographical spread, instinct to rule over others and exploit and fulfil hundreds of other impulses and needs, most of which are arbitrary. After the power-based society was organised, human relations became complicated. And, in no books of the world have the complicated human relations been so vividly described as in the *Mahabharata's* 200,000 verses written by Veda Vyas. The *Mahabharata* is eight times the size of Homer's *Iliad* and the *Odyssey* put together. Think of any real-life situation that we face today – envy, anger, remorse, revenge, honour, duty, rape, murder, adultery, moral dilemma, power and religion, conflict, loyalty, betrayal – these and any other human situations have parallels in this epic which has governed our life and conduct for more than 2,500 years.

However, power is the central theme of the *Mahabharata* story. For instance, after the war was over, Yudhishtara asked the dying Bhishma Pitamah: "Why do humans need a ruler (a state)?" Bhishma answered: "When humans help each other, there is no need for a king (state); when bad persons emerge, there arises the need of a ruler (power). People most affected by bad persons are the poor, the weak and women". Vyasa's perception is that the state's major – or the only – purpose for existence is the protection of the weak from the strong. But over a time, the state itself became oppressor of the weak. Rule of law, by history and evolution, presumes the existence of violence and oppression

when the king and the state mandarins tend to ignore the distinction between good and bad, between the law-abider and the law-breaker. The interpretation of good and bad also differ. Moses foresaw it and prescribed divine laws to discipline kings; Plato advocated abolition of laws and Marx favoured withering away of the state.

But only Veda Vyasa could fully comprehend the infinite variety and complexity of human relations when perpetual interaction between and among individuals, society, state and divinity make it hard to arrive at the concept of absolute right and absolute wrong. Pitamah Bhishma, Guru Dronacharya, Kripacharaya, and Karna were most virtuous and wise but they fought for a sinner, *Duruyodhana*, because the concept of duty (*dharma*) of these powerful persons was different from those of Lord Krishna, Pandav brothers and Mahatama Vidura. Consequently, one generation perished at Kurukshetra and the question remained unanswered. Down in our times, the dilemma of right and wrong continues unresolved. Germans thought it good to eliminate Jews for racial superiority which the world opposed. And, two global wars were fought that turned Europe into a slaughter house of the world. The Mahabharata, which includes the *Bhagavad Gita*, avoids prescribing the code of conduct which Plato, Moses, the Bible and Marx did in great detail. Lord Krishna leaves it to Arjuna to do "*what you exactly wish to; decide on right and wrong yourself*". Veda Vyas knew there could not be an all-time code of human conduct, or any absolute concept of right or wrong.

History is ordinarily written around the exercise of power by emperors, kings, church, dictators and democracies, capitalists and corporators. It could equally be written around the sources of power and the instruments that enforce them. Historical change would then be a change in the relation of person with organisation. Max Weber,



"Some people have the tendency to be slave and the Superman must impose his will on them." *Nietzsche* (Friedrich Wilhelm, 1844-1900) who provided "*idea support*" to dictators, including Hitler

German sociologist and political scientist (1864-1920) has defined power as the ability "to impose one's will upon others." Bertrand Russell says power and glory remain the "*highest aspiration and the greatest reward of mankind.*" It was no different in India either. Composed as a primer for kings, Kautilya's *Arthashastra* is a tough-minded realpolitick which makes no concession to the gentler sensibilities in its understanding of how the business of state is to be conducted. Kautilya urges the king to use power by means of an intricate surveillance system and constantly destabilise rival kingdoms through intrigue and war. He favoured use of force, deception and conspiracy as a routine policy instrument of the state. The Kautilyan model of power is only one of several that the Indian tradition evolved since the Vedic period when thinkers were preoccupied with the question of making *power answerable to wisdom*. The tradition of *combining power with wisdom* has made India's concept of power different from the West. No wonder, Neitzsche produced Bismarck and Hitler, while Kautilya produced Ashoka.

Power is of three kinds: condign (punishment), compensatory (award) or conditioned (persuasive) power. And, all these have been exercised in different ways to impose one's will upon others.

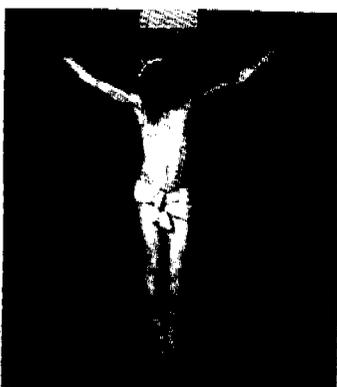
Condign power is the ability - personal strength, army, bombs, etc. - to punish those who refuse to obey. Condign power is exercised often in brutal manner; it is often direct, cruel and visible. The rulers did that in the past. Some countries where democracy does not exist do it now. Germans sought to exercise condign power through two global wars; Britishers did that for two hundred years during their rule over India, and five of 17 tiny despots are doing that in the Arab world even today. Punishment is the oldest method and most cruel way of making people submit to the wishes of the ruler.

Compensatory power wins submission by the offer of rewards. As personal or public rebuke is a form of condign power, so praise also is a form of compensatory power. However, the most important expression of compensatory power is pecuniary reward for submission to the economic or personal purposes of the employer or ruler. The common feature of both condign and compensatory power is that the individual is aware of his or her submission - in the one case, compelled and in the other, rewarded.

Conditioned power, in contrast, is exercised by changing belief, by *persuasion, education*, or by other conditioning method.

It is taken for granted that when an exercise of power is sought, an organisation which is the basic instrument for persuasion, is set up. Personality, property, and organisation are often combined to exercise power. From this comes a varying combination of instruments for the enforcements of conditioned power. Good speakers, writers, actors and NGOs organise this power in very subtle ways. Media have changed the world as no conqueror could do before. The entire democratic system is based on the power of persuasion. Trade and business exercise this power through advertisement to earn money, while politician do it to acquire power and keep it. NGOs use the power to change schemes of things. No wonder, Dr. Bindeshwar Pathak, the founder of the largest NGO (Sulabh) in India, is a *great communicator*.

In early Christian days, power originated with the compelling appeal in the name of Christ. The church came into being as an instrument to enforce the divine power. And, the sources of the church power was its property, income and personality of religious leaders who *conditioned* belief and gave threat of *condign punishment* either in life or after death. Galileo was condemned by the church for his "heretical" statement that the earth, not sun, moves. Bruno Lucilio, Vanini, Franci Kett and Bratholomer Legate and Wightman were burnt alive at the stake for saying that the earth moves. This was a formidable power of church.



POWER USED TO KILL FAITH.

"What is truth",

**asked Pontius Pilate, Roman
Governor of Judea, and did
not wait for an answer.**

**And Jesus was hanging
on the Cross**

Individuals and groups seek power to advance their own interests, or, to extend to others their personal, religious, or social values; or to win support for their economic or social perception of public good. The industrialist buys submission of his workers to make money for them. The religious leader persuades his congregation through media, or elaborate rituals of obeisance to win their loyalty. Admiring crowds, applauded speeches, precedence at dinners and banquets, a place in the motorcade, access to the corporate jet, the military salute - all these mark the possession of power. These rituals are rewarding. The Britishers ruled India more by these rituals than by

army which at no time exceeded 10,000 men to control a population of no less than 40 crore (1947). The British military commands, the conveying of court decisions, the statement at the end of the meeting when the person in charge says, "Well, this is what His Majesty wants", a sense of self-actuated worth also illustrate the exercise of power. The British architecture was more to inspire awe (and force obedience) than to provide accommodation to British rulers. Power is also sought to serve society. This is done by leaders who seek to change social order by persuasion like Gandhiji; or, by force like Ataturk of Turkey.

However, some people want power just to enjoy its exercise. An individual can seek power to impose his values on others; or, to further a vision of social virtue. Politicians are described as "*power-hungry*"; the obvious implication is that they seek power to satisfy an appetite. John F. Kennedy said, "I run for President because that is where the power lies." Corporations take over other corporations not always in pursuit of profits but also in pursuit of the power that goes with the direction of a yet larger enterprise. Politicians sacrifice wealth, leisure, and much else to the rigours of public office only to enjoy power. Bureaucratic power is bad, but public servants with power to render public service are good. Corporate power is dangerous. *Conditioned power* is also different from other powers because it is regulated by society and protected by law. In democracy, freedom of speech and expression is guaranteed by law. In the USA, the *First Amendment* to the Constitution guarantees free exercise of *conditioned power*. It was enacted before the use of conditioned power became central to the functioning of free society.

THE SULABH NETWORK SYSTEM

Power, however, creates its own resistance. Factories have labour unions, the church has protesting doctrines. (A large number of movements including Arya Samaj in India and Protestant movement in Europe were *protesting doctrines*.) The sellers have consumer forums and the Government has opposition. The dialectics of power is that it produces resistance in a variety of ways until an equilibrium is found between those who exercise power and those who submit to it. Out of this concept of equilibrium of power, says Dr. Bindeshwar Pathak, the civil society organisation is born. Dr. Pathak has evolved the networking system in which there is no ruler and no ruled. It is a system where the conflict



"Power is the ability to impose one's will upon others", Max Weber, (1864-1918), a German Sociologist who has analysed human action in terms of his motive

for power will not happen because nobody possesses it. Thus, Dr. Pathak has put his concept into practice and set new standards in managing social service associations which have to acquire the twin skills of managing resources and managing human relationship to justify their existence.

To deliver on these two, Dr. Pathak strengthens the organisation instead of individuals, through the networking system in which there is no top nor bottom. Nor is there any centre to put focus on individuals or their high status. It is a moving network with multiple nodes at curves where clusters of individuals interact with each other

and pass information, resources and check notes to again swing around in the network system. And, ultimately, discharge the various allotted functions which, acting with other nodes, promotes the objectives of the organisation and empowers the system, instead of individuals.

In other words, the power, resources and responsibilities are widely dispersed in the network system which encourages individual initiatives to deliver collective goods. In this system, not even the top man necessarily knows what the *cluster men* at the nodes are doing until the revolving system starts showing the fault-lines, setting in motion the self-correcting process. In this new management system, the man who seems to be the last in the set-up may be more important, in terms of resources and decision-making authorities, than the man who seems to be in high focus. This is one reason why the chairmen of various Sulabh units have also the job of keeping toilets clean and supervising social development programmes, apart from addressing seminars, writing articles, campaigning and doing other academic work.

On the contrary, in the Governmental organisations, there are hierarchies - from chief secretary to the lowly peon - which are wedded to the structural rigidities: rules, norms and disciplines.

This stiff and unchanging structure has made the Government incapable of delivering on the social programmes. The Government functioning is based on power, while NGOs grow on persuasion and pressure which together make them a good delivery system. The hierarchial system could run the Roman empire, but not a small NGO. Pontius Pilate (26 AD 36), Roman Governor of Judiea, after ordering crucifixion of Christ, turned to his mistress and said: "*Darling, you do not know how much little wisdom does it need to govern the world.*" This was the system which also held together the British empire of which civil services were the backbones. Rudyard Kipling (1865-1936) said: "It is the divine right of the British to rule India without law." And, civil services in India did this job commendably well in the hierarchical system which succeeded because the central concept was to rule (or realise revenue) by force and not to develop a society by broad-basing the power-sharing concept through people's participation. Civil services cannot be agents of change. They have no role in a democratic system. India has state-oriented culture and not group-oriented. And, civil services have worked to undermine the growth of civil society because they fear it will curtail their powers.

HOW DREAMS CAME UNSTUCK



Persuasion is power,
J.K. Galbraith

Perhaps one of the most devastating consequences of socialism in the former Soviet Union and Eastern Europe was the destruction of civil society which had hampered the emergence of market economies and stable democracy. The Leninist state set about deliberately destroying all possible competitors to its power, from the "*commanding heights*" of the economy down through the innumerable farms, small businesses, unions, churches, newspapers, voluntary associations, and the family itself. Russian civil society, before the Bolshevik Revolution, was weakened by centuries of absolutist rule. What existed, such as the small private sector and social structures like the peasant

commune, were ruthlessly eradicated. By the time of Stalin's consolidation of power in the late 1930s, the Soviet Union exhibited a "missing middle": the complete dearth of strong, cohesive, or durable intermediate associations. That is, the Soviet state was very powerful, and there were many atomized individuals and families, but in between there were virtually no social groups whatsoever. And, when the Soviet system fell with a thud, there were no intermediate institutions to provide cushion to it. No wonder, there is a chaos in Russia today. A proud and once a prosperous people have no food to eat.

The Sulabh network model, based as it is on the wide dispersal of power and responsibilities, does the twin job of social change, (which Government also seeks to do through power) and raise resources to become self-sustainable. Modern multinational organisations, ethnic and advocacy groups have also adopted the networking system, although they do the only job of either making money (as in business) or do one-point work - campaigning like Greenpeace, Amnesty International, etc. Sulabh is the only network management-based system which does both. And, very successfully at that.

SOCIAL AUDITING

Yet another feature of the Sulabh networking system is "*social auditing*". The accounts auditing is done on known lines to ensure that money is well-spent and duly accounted for. But, more important is the social auditing which consists of evaluation of social work. Sulabh is committed to promote social objective which is the only way to measure its achievements. Dr. Pathak himself takes a periodic close look at social projects, including liberation, training and rehabilitation of scavengers and their social upgradation. As a result of social agenda, more than 3,000 women have been trained to work in slums; AIDS and sanitation education is given to them. Apart from the area of core competence, *sanitation*, Sulabh works to organise healthcare centres in toilet blocks; develop urban slums into a model healthcare and sanitation habitats; train women; set up rural healthcare and sanitation model; etc. Setting up schools; developing model villages; producing literature on sanitation; environment and on hazards of open defecation; human waste management; organising voluntary blood donation camps and yoga centre are the other areas of Sulabh initiative.

The networking system has, however, problems. More than 100-year-old *Societies Registration Act (1860)*, under which NGOs are registered, does not help free growth of civil society. This act was made by the British to strengthen their imperial control over the people from the village level. Now, NGOs



Gandhi and Nehru together exercised the *power of persuasion* most effectively to stir the nation into struggle for Independence

have become a major instrument of growth. But outdated Act hurts the development of NGOs as self-sustaining organisation. No wonder, most NGOs continue to depend on assistance instead of standing on their own legs, working under this dated law. This law need to be amended or abolished to be replaced by new laws.

Let us find out how the world was like in 1860s when this Act was passed. After the 1857 first War of Independence (which Britishers call *Sepoy Mutiny*), the British Government took a series of steps to tighten its grip on their Indian subjects. In 1859, *Military Police* was set up to spy on armed forces which rebelled against the Britishers a year earlier. In 1861, the *Police Act* was passed (which still continues to be in force in amended forms). It may be noted that the then North-West Provinces was the centre of discontent. It was here that the Mutiny broke out. Marauders, called *Pindaris*, were rampaging the vast areas, including the present day West Bengal, Bihar, Orissa and a large parts of Uttar Pradesh. The British Government had launched multipronged attack to contain unrest, including strengthening police network, policing the army and setting up grassroots organisations to control the imperial interests.

It was during these turbulent times that the *Societies Registration Act* was passed in 1860. The Act which was adopted to strengthen British control cannot promote growth of civil society, an opposite concept. Hence, NGOs' network is not sufficiently strong in India to discharge its functions. The need is to scrap this Act and make a new one, promoting the Sulabh model of the network management system which will also ensure grassroot people's participation in the growth process on the self-sustaining basis. This is how it should be in any free society. For that matter, Dr. Pathak's concept on networking system is novel.

Dr. Bindeshwar Pathak is essentially an organisation man. He thinks in terms of meetings, consultations, campaigning and seminars; his belief in the *collective wisdom* is truly pathetic. On the slightest provocation, he gets into a huddle and cries, *Eureka*, indicating as if he has found solutions to problems after talking to people and making them partners in progress. ●

People work harder when they know they are creating a new social order rather than earning more money for their boss.

- Dr. Bindeshwar Pathak

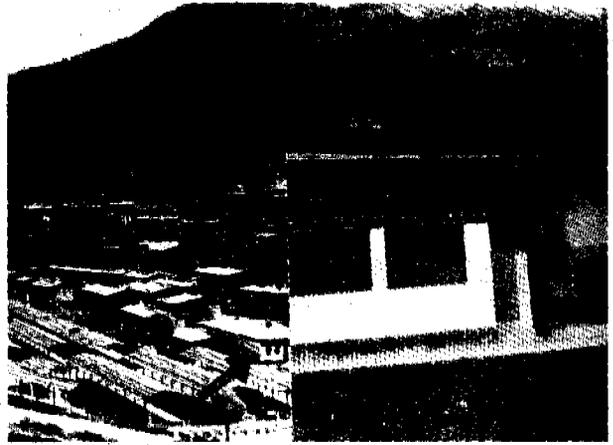
Sulabh leads the growth of civil society in India

Throughout history, groups of people had joined together to create something new and wonderful; it may be winning war or making peace. The youthful scientists who invented computer and creators of the Internet – these are a few of the many great groups that have reshaped the world in very different and enduring ways. In a society as complex as ours, the urgent projects require the coordinated efforts of talented and dedicated people. Whether the task is building a global development network or discovering the mysteries of the human brain, one person can't hope to accomplish much, however gifted or energetic he or she may be. There are simply too many problems to be identified and solved.

However, we in India resist the idea of *collective creativity*. Our habit refuses to catch up with our reality. We cling to the myth of the lone ranger, the romantic idea that great things are accomplished by great leaders alone. We think in terms of the great man or great woman, instead of the great group. But in a global society, in which timely information is the most important commodity, collective effort alone can achieve great things. Very rightly, Alexis de Tocqueville, says: "*the art of association is mother of success.*"

The success of a country depends on the healthy growth of *civil society* which consists of intermediate institutions outside state control, including businesses, NGOs, educational institutions, clubs, unions, media, and advocacy groups. The strength of these institutions largely determines the strength of a nation. Family is the primary building block of society through which culture, values, skill, religion and genetic characteristics are transmitted across generations. The socialist countries, including those of the former Soviet Union, destroyed the family system, as a result of which

they plunged into social anarchy, far beyond the capacity of the state to control. And, the socialist system fell with a thud heard all over the world. The entire Africa has been united in family and tribal loyalties and despite centuries of turbulence, conquest, wars,



Sulabh toilet is situated right in the midst of the valley at Thimpu, Bhutan

torture, and oppression, the Black Continent still exists as a vibrant society. It is true of India also; instead of tribes, we have the caste system which has held Indian society together although it is based on discrimination, injustice and cruelty. However, social justice is a modern concept which was unknown and unpractised in the ancient world since the Roman times and before. It is an irony of history that all great empires had been built on exploitation of man by man. The situation has not changed even today in many developing countries.

The *civil society* is a the "second line" of defence in case the "first-line" (the government) fails to uphold what is perceived as public morality and social accountability. To begin with, all UN organisations were part of civil society structures but as their roles in regulating global relationship expanded, a large number of covenants, agreements, MOUs etc. had been signed which have the force of law and their violation is judged at International Court of Justice, The Hague. And when the UN took to arms to preserve peace in the world, including in Balkans, Africa Iraq, and in many other countries, it acquired the status of a "super govt." and its character as a civil society institution changed enormously.

However, Amnesty International, Greenpeace, a large number of environmental and human rights organisations, including the UN Conference on Environment and Development" (UNCED - which organised the Earth Summit in Rio de Janeiro in 1992) are very powerful instruments of articulating public opinion. President Richard Nixon had to resign in 1974 following revolt by the Press,

a civil society organisation, that uncovered the Watergate scandal. The White House independent Counsel Kenneth Starr brought President Bill Clinton to apologise to the nation for his "inappropriate" relation with White House intern Monica Lewinsky (August 18, 1998). The public opinion, as represented by the civil society organisations specially NGOs, has critical influence on the running of liberal societies in the world.

Throughout the world, the State is facing increasing demands upon it; it is called upon to modernise institutions and maintain social cohesion, seriously weakened by the globalised process of exclusion. It is also urged to protect jobs and guarantee a minimum income and social security. And to fight war, if necessary. As the end of the century approaches, we are beginning to see the decline of the state and emergence of some other new arrangements to help solve social and economic problems. This century has been a time of immense social innovations; the emergence of non-profit and non-governmental organisations is the one. They are vehicles through which citizens exercise individual initiatives in the private pursuit of public purposes. If democracy was the great social invention of the eighteenth century, growth of civil society organisations is the greatest social innovation of this century which is becoming a major social and economic force in today's world.

The Cold War, which followed the World War-II, produced many structural changes in society, one very obvious one being a shift in power from the state to the advocacy groups, working in different areas. This shift did not reduce the powers or prestige of the State, but the process of growth in almost all areas of human endeavour has started taking place outside State control. And, the non-government organisation (NGO), which is the symbol of civil society, came into existence in large numbers.

The amazing fact is that independent sovereign states are seeking membership of NGOs. For instance, Mozambique and Cameroon, formerly Portuguese and French colonies, now seek the membership of the Commonwealth, an NGO. Rwanda, a former Belgian colony, also wants to be a Commonwealth member which, working as an NGO, can intervene to stop the carnage in the country where over two million people have perished in ethnic conflict. A large number of NGOs are working in Bosnia to restore peace in the Balkan State which has witnessed unprecedented slaughter during the past few years. In almost all major areas of crisis and conflict, NGOs are playing critical roles. These non-state groupings are also

networking to make themselves more effective. There are global and national NGOs. These include *Greenpeace*, *Oxfam*, *Amnesty International* (which began in 1961 as a letter-writing group), Red Cross, CARE and many other NGOs which are working in a variety of areas. For that matter all UN outfits, regional and global, are also voluntary organisations.

THE GLOBAL SPREAD

In today's world, large areas of human endeavour are covered by civil sector organisations. For instance, in the eight major countries (the US, the UK, France, Germany, Italy, Sweden, Hungary and Japan), the civil society sector employed 11.9 million (1990) full-time paid workers, representing one out of every twenty normal jobs, and one out of every eight jobs in fast-growing service sector which is where the civil society sector operates. In 1990-92, the civil society sector had expenditures of \$614 million which was 5 per cent of the combined gross domestic product of the eight countries and 20 per cent larger than the gross national product of Spain. In Germany, France, and the US, the civil society sector, with 6 per cent of total employment, and which accounted for nearly 13 per cent of the job growth during the 1980s, was created by the civil society sector organisations (NGOs). In 1990, the non-profit organisations accounted for:

- Four out of every 10 hospitals and virtually all sport facilities in Germany;
- One-third of all child daycare and 55 per cent of all residential care in France;
- Over half of all hospitals beds and half of all universities in the US;
- Over 75 per cent of all universities in Japan;
- Over 20 per cent of all primary and elementary education in the UK;
- Over 40 per cent of all residential care facilities in Italy; and
- Forty per cent of all dwelling units constructed in Sweden.

(Source: *Society* magazine 1997)

The number of NGOs has increased substantially in recent years. In France, over 60,000 voluntary associations were created in 1990 alone, compared to fewer than 18,000 in 1961. In Germany, the number of such associations per 100,000 population nearly

tripled from 160 in 1960 to 475 in 1990. Hungary, within two years after the fall of the Communist rule, boasted of over 13,000 associations. Sweden displays the highest participation rates in civil society worldwide: most Swedes belong to one or more of the country's close to 200,000 civil society associations, creating a dense social network of 2,300 associations per 100,000 population. Some



Mr. Maurice Strong, the Rio man, along with Dr. Pathak at a NGO meeting. In the middle, is Mr. Kamal Nath, former Union Minister for the Environment

45,000 non-profit organisations are functioning in Sao Paulo, Brazil and another 16,000 in Rio de Janeiro. In Thailand, Bangkok alone boasts of 2,200 non-profit organisations, and close to 11,000 have been identified countrywide. Today's powerful non-state outfits are, however, not without precedent. The British East India Company (an NGO) ran a subcontinent, and a few influential NGOs also did that in the past. But these are exceptions. Both in numbers and in impact, non-state organisations have been powerful and, their importance is growing by the day.

A CASE IN POINT

The recent (Dec. 7, 1997) case was the role of Rotary International when an estimated 122 million children across India were administered polio vaccine in what has been described as the "world's largest and most successful immunisation event". The exercise was part of the Pulse Polio Immunisation Programme that envisaged the eradication of this crippling disease by the end of the millennium. Rotary International has gained recognition worldwide for making polio eradication a reality. Extending its role from being that of a fund raiser (it has contributed \$5.5 million in 1997), it mobilised over 10 million volunteers, including men in uniform, youth organisations, NGOs, corporate and media sponsors, medical

practitioners and schoolchildren to do the work. It also launched a media campaign through television, radio, banners, stickers and even prayers in mosques to create awareness and inform the public of the dates on which the vaccine would be administered. Workshops were held to brief local health officials and field workers, specially in Bihar, Uttar Pradesh, Madhya Pradesh and Rajasthan which accounted for 48 per cent of the cases in 1995. In some States children were even enumerated and enlisted booth-wise so as to ensure optimum attendance and follow-up action on dropouts. This is the role of an NGO and its impact on society.

In India, more than 30 lakh societies are registered under the Societies Registration Act (1860). And of these 15,000 have Foreign Contribution Regulation Act clearance. There is no way of knowing as to how many of them are NGOs. However, only those organisations which are self-sustaining are able to survive on their own and deliver the goods. A large number of well-meaning NGOs in India, including Arya Samaj, Brahmo Samaj, Bhoodan, and Gandhi movements group, etc. phased out (although not without playing important roles) because they were not self-sustaining. The Sulabh International Social Service Organisation is the leading and the largest NGO in the country (according to the Planning Commission), working in diverse fields.

POWERFUL NGOS

As a matter of fact no one knows how many NGOs are there in the world or how fast the tally is growing. The true number is certainly in millions, from small village associations to international groups like Greenpeace and CARE which have an annual budget of nearly \$400 million. Except in China, West Asia, and a few other places, where authoritarian governments limit the growth of civil society, NGOs' role and influence have exploded during the last decade. Their financial resources and expertise sometimes exceed those of smaller governments. "We have less money than Amnesty International, and we are the arm of the UN", said Mr. Ibrahim Fall of the UN Centre for Human Rights in 1993. Today, NGOs deliver more official development assistance than the entire UN system (excluding the World Bank and the International Monetary Fund). In many countries they are delivering the services like education, healthcare, environmental protection, disease control and sanitation. The range of their work is almost as broad as their interests. They

breed new ideas, advocate, protest, and mobilise public support, do legal, scientific, technical, and policy analyses, provide services, monitor and enforce national and international commitments, and change institutions and norms. The Association for Progressive Communications provides 50,000 NGOs in 133 countries access to Internet users for the price of a local telephone call.

The dramatically lowered cost of international communication has altered NGOs' role and changed international outcomes. Within hours of the first shots of the *Chiapas* rebellion in southern Mexico in January 1994, for example, the Internet was swarmed with messages from human rights activists. The worldwide media and other groups focused on Chiapas which in other times would have been a case of bloody insurgency. Women's and human rights groups in many developing countries have linked up with more experienced, better funded, and more powerful groups in Europe and the United States. They pressure leaders and change state policies. As a matter of fact, the telecommunication revolution, with deep political and social consequences, has changed the world. Widely accessible and affordable technologies has broken the State monopoly on information which is power. New technologies have also changed people's perceptions and attitude. Fax machines, satellite hook-ups, and the Internet connect people across borders with growing ease. These technologies have the potential to divide society along new lines, separating ordinary people from the elite who have wealth, education and information power. The elite have more in common with their counterparts in other countries than with their poor countrymen at home. However, the information technologies have diffused monopoly by spreading power (knowledge and information) among more people and groups. In lowering the costs of communication, consultation, and coordination, a new network system has emerged which is more powerful than any organisation before, uniting the countries of the world in more ways than one.

SULABH LEADS THE GROWTH

Dr. Bindeshwar Pathak has dramatised the power and possibilities of civil society associations, by saying, "*What the Government can do, NGOs can do better.*" The Sulabh International Social Service Organisation is the largest NGO in India (and one of the largest in the world) not only in terms of geographical spread and the manpower on the rolls (35,000) but also in terms of the impact it has been able

to make on the lives of the people. Its social obligation and the self-sustaining plan compares well with Oxfam or Greenpeace although Sulabh operates in entirely different fields, including promoting environmental sanitation, human rights and human resources development. However, unlike Oxfam and Greenpeace, Sulabh operates from the grassroots and seeks social development through empowerment of the poor. Sulabh is a caste-neutral social service outfit with the macro-plan for the entire society with focus on sanitation. Sulabh technology, the time-tested and globally approved, is central to its plan for social change. It works, as a transmission belt for cross-border knowledge transfer to make its social services competitive and professional.

Sulabh, for that matter, is an agent to globalise the Indian social service networks while retaining the indigenous cultural and social features to make the system acceptable. Dr. Pathak says: "Our social fundamentals seem to be flawed. Those who do the supposedly inferior job like cleaning toilets or sweeping streets are also considered inferior individuals. They have been thrown out of the social system to live far away from the habitat as untouchables. We don't touch them, nor do we allow their children to come up. It is not the case with the West; which is why they grow and we don't. For instance, road sweeper Phillip Mitchell (of Easebourne, West Sussex) was awarded



SWEEPER HONOURED BY THE QUEEN:
Road sweeper Phillip Mitchell sweeping the road in the village of Easebourne, near Midhurst, West Sussex. He has been awarded the MBE (Member of British Empire) in the Prime Minister's first "classless" Honour List (1995)

MBE in 1994 by the British Queen. It is not conceivable in India that a scavenger will be honoured with state awards. Casteism and communalism are only extension of social prejudices. They also indicate that our social fundamentals are flawed."

AGE OF ACHIEVEMENTS

Dr. Pathak says: "We live in an age of achievements and not compassion. Poverty is a problem of technology, education, training, health and hygiene, and attitude. In sum, social capital. And, not of compassion. These problems should be addressed collectively, instead of leaving the poor on the sufferance of the rich who will throw leftover food and a paisa more to salve their conscience than to help the poor get out of poverty. In order to improve the conditions of the poor, the social structure has to be re-constituted to be made more poor-friendly without hurting the rich who create jobs and expand the national cake for all to share, including the poor. Ill-feelings (Marx says: "Expropriator will be expropriated") or injustice, like belief in the survival of the fittest, are negative feelings on which an enduring social order cannot be set up." Dr. Pathak never tires of quoting Gandhiji, saying: "*Eye-for-eye policy will leave the entire nation blind.*"

Nor can the old advantages, like social status, money and power, produce a healthy social order which has to be based on the universal entitlement to the advantages and disadvantages of a nation. Social banditry, crime, casteism and unearned privileges are the consequences of skewed social dispensation which produces conflict and crisis, manifest in social instability and violence. No wonder, there is total loss of faith in law and political leadership. This situation also accounts for the growth of the people's groups, NGOs, which essentially work as counterpoints to the State.

Dr. Pathak marks out the difference between Government and non-Government organisations. The public sector works to optimise the *public value*, while NGOs work to optimise the *social value*. He says that the extreme poverty and backwardness are there because of the inability of the people to act together for their common good. Dr. Pathak calls it "amoral familism" which is to say: "I will look after myself; you look after yours." This lack of civil engagement is also responsible for poor governance and poverty. The concept of togetherness is best promoted by NGOs which also set up clubs, and neighbourhood cooperatives besides laying roads, collecting

taxes, rooted as they are in community tradition. They have reinforced the message of self-help, cooperation and civic solidarity. Community action, which NGOs represent, has made considerable impact on education, the environmental sanitation and in other fields where the state cannot do much. In so doing, we promote citizen-Government alliance to solve problems.

GROUP BEHAVIOUR

The civil society does not arise inevitably from advanced industrialisation. On the contrary, the USA, Germany and Japan became industrial societies because they had healthy endowment of social capital and spontaneous sociability. This growth was possible because of the wide network of civil society structures, marked by a high-trust social regime. Civil society also encouraged group behaviour which promotes collective economic activities that lead to prosperity as was the case with Germany and Japan after their defeat in the last global war. Group behaviour also encourages the habit of working together for common good. For instance, people work harder when they know that they are creating a new social order rather than earning more money for share-holders. Hence, the growth of civil society is the basic condition for the growth of a country, says Dr. Bindeshwar Pathak.

Dr. Pathak says that a successful nation has three attributes: politically, it is free and democratic; economically, it is productive and equitable; and socially, it is cohesive and peaceful. India has made considerable gains on the first two counts. Politically, general elections have been fair; economically, we seem to have attained a seven per cent sustainable growth rate. The current reforms have created the conditions for broad-spread prosperity. But socially, we have not done well. The society has been divided along caste and communal lines; women are ignored, education is not universal and disparity has widened, causing social unrest. It seems that ours is a society at war with itself. It is rare to find a nation which scores on all three attributes. Most Western countries have democracy and prosperity, but they also suffer from social disintegration. Far-eastern nations have prosperity and social cohesion, but they suffer under authoritarian political regimes. We have to promote social cohesion to make other social fundamentals work.

At the dawn of Independence, the dominant moods were of hope and romance - hope of a new society built on an edifice of

justice and equality and romance of the new-won freedom. The twin moods lasted for two decades. The change came in the late sixties. Hope turned into frustration and romance gave way to nostalgia. Old-timers started saying that the British ruled better and they looked wistfully to the past. Years of frustration has ended in violence. This happened, Dr. Pathak says, because a large number of people were socially excluded from the development process. They began to believe that abolishing poverty was entirely the responsibility of the government. And, political parties promised moon at the hustings by making wild promises. "There is a long story of sweat, tears and toil for dreams to be realised. To make a nation grow, the entire people will have to work together and work hard. Hence the growth of civil sector is inevitable for the growth of a country," says the Sulabh Founder. ●

**By treating our planet as a community,
we can save our natural riches for future
generations. - Rio Declaration**

Survival of human civilisation turns on ecology

One is always intrigued by the power of simple ideas that sometimes reshape the world. It may be "discovery" of zero and decimal by Aryabhata or the invention of the wheels by Assyrians. They have changed the world like nothing else did before. A similar idea took root 22 years ago in America when a handful of concerned citizens raised their voice against pollution that was ruining the quality of life. The outrage led on April 22, 1970, to the *Earth Day* which became the annual event later, involving some 20 million Americans who turned out in large numbers throughout the country to protect the environment. In earlier times, it was the empire which used to be chief obsession of strong nations; later, it was the new idea which caused many revolutions in the 18th and 19th centuries and, still later, it was the technology and the weapons system which determined the strength and the greatness of a country. And now, it is ecology, the degradation of which is causing concern to the rich and the poor alike.

Ecology, or the environment, is the aggregation of all living and non-living things which provide the life support system on this planet and the absence of which has made other planets uninhabitable. It is, therefore, necessary for man to preserve the ecological system which is now threatened by rapid industrialisation, urbanisation, population explosion and increasing consumerism. And, hence the global concern over the man-nature disequilibrium. Environment came on the world's agenda only after it was discovered that the growth, and that too a very reckless one, was taking place at the cost of the environment. Since growth is resources-based, the higher the growth in terms of human consumption, the thinner the support-line to sustain it. Nor are all resources renewable; water, air, land are limited. Population, mostly in the poor countries, doubled during the last thirty years

and the frightful technologies to exploit nature's resources diminished the possibility of the human civilisation lasting forever.

Between 7,000 and 8,000 BC, when glaciers were melting, Mesopotamia saw the creation of agricultural surpluses. And the trading of those surpluses is believed to have been responsible for the *invention of money*; they were first communities to use brick and stone. Jericho, for example, the oldest known city, was founded in this period when Europe was beginning to recover from the Ice Age. Some historians believe that the first appearance of highly organised societies in the fertile river valleys of the Tigris, the Euphrates, and the Nile was stimulated by a major climate change 3,000 years ago. A new climate pattern – characterised by drought and floods – forced communities to cluster in river valleys. The challenge of containing and distributing the floodwaters for irrigation, storing the annual harvests, and distributing food supplies required many basic mechanisms and that created human civilisation.

Where is the ancient Phoenician city of Carthage? It is buried in the sand dunes of northern Africa. In a series of wars between Romans and Greeks, joined by many other regional powers, forests were cut, dykes dismantled and river Tunis again silted to change its course 16 km east to what is modern capital of Tunisia today. And, Carthage vanished into the thin air. Let us not forget that Carthage was the city where Caesar met Cleopatra on the sight of whose nose, the Roman emperor launched a thousand ships and conquered the known world for her. This all



Unpolluted still

happened because man did not learn to live in peace with nature.

The effect of ecology on civilisation has been considerable in Europe. The proximate cause of the suffering and social unrest after Napoleonic wars (1800 to 1815) was a change in the global atmosphere following an unusually large series of eruptions on the islands of Indonesia. Scientists estimate that 10,000 people were

killed in the initial eruption and 82,000 more died of starvation and disease. From Ireland to England to the Baltics, rain fell almost continuously from May to October in 1915 which destroyed crops, caused food riots, and the near-collapse of society throughout the British Isles and Europe. The historian John D. Post has called it "*the last great subsistence crisis in the Western world*".

Small climate changes caused by volcanic eruptions may also have played a major role in one of the modern era's seminal events, the *French Revolution*. In his groundbreaking study of the history of climate, *Times of Feast, Times of Famine*, Emmanuel Le Roy Ladurie describes in meticulous detail the disastrous crop failures and poor harvest in France during the six years immediately preceding the Revolution of 1789, culminating in the bitter winter and one of the coldest Mays. The effects of climate change on the political and social stability are also powerful. Now, humankind is changing the climate of the entire globe to a degree far greater – and faster – than anything that had caused havoc before.

One of the most dramatic effects of climate change on civilisation has been massive migration from one geographic area to another. In fact, one of the greatest migrations in history – the one that introduced human beings into North America and South America – came about as a direct result of climate change. During the last Ice Age, 20,000 years ago, when vast amounts of seawater was frozen into ice, sea-level was about three hundred feet lower than it is today. Large areas of those parts of the ocean bottom (we call the *continental shelf*) were exposed as dry land, and shallow ocean straits, like the Bering Strait and the Gulf of Carpentaria, were instead land bridges. These bridges served as the migratory routes for the people, now known as aborigines. As the glaciers



Only one earth, care and share

retreated, the sea level rose again some 10,000 years ago, stranding the native Americans and aborigines on the new continents. At the same time, as temperatures climbed, the global climate settled into the pattern that it has roughly maintained since.

But it is now becoming clear that climate is even more basic to the development of humankind than before. Anthropologists, evolutionary biologists, and climate specialists - including Elisabeth S. Vrba, Frederic E. Grine, Richard G. Klein, and David Pilbeam - have recently combined the history of climate changes with the anthropological evidence to produce a new consensus - that human evolution itself was shaped by dramatic transitions in global climate patterns during the last 6 million years. The science writer William K. Stevens describes "an outpouring of analyses" and says that "scientists are sketching out the influential roles played by climate and ecology in shaping human evolution".

Historically, climate tragedies like the one that caused the potato famine have led to massive migrations toward wealthier countries, especially the USA. Three decades earlier, the great subsistence crisis of 1816-17 had also stimulated a flood of migration, not only from Europe to the USA but also within the USA. For example, historical accounts of the westward migrations from Maine indicate that after "the uncommonly cold and unpropitious" springs of 1816 and 1817, a terrible fear of famine lent "a fresh impulse to the enchanting spirit of emigration. Hundreds who had homes, sold them for small considerations, and lost no time in hastening away into a far-off country".

EL NINO, THE CHILD

"The year 1998 was the hottest year of this millennium. Thousands of readings from satellites and weather stations across the globe had confirmed that the world had been warmer in 1998 than at any time since 1880 when Britain's meteorological office collected reliable measurements of global temperatures," reported *The Independent*, London, in August 1998. This belief may be further reinforced by the fact that so far each month has broken previous global temperature records. In fact scientists, who have estimated temperatures from past centuries by the growth of tree rings, said this spring may have been the hottest in a thousand years. The US-based *National Oceanic and Atmospheric Administration* (NOAA), which gathered the global temperature data, said that every month

from January to May (1998) "far exceeded" previous records. Scientists at the NOAA said *El Nino*, is largely responsible for the record high temperature in 1998.

El Nino is a ocean current that occasionally occurs in the Eastern Pacific Ocean, upsetting climatic pattern and causing heat and rain. *El Nino* is a Spanish word which means *The Child* because this unusual phenomenon was first witnessed in 1891 on Christmas day by Peruvian fishermen. In 1925, 1941 and 1957-1958, *El Nino* was again witnessed, causing major climatic disturbance - heat, rainfall and storm. The heating caused by the *El Nino effect* will make glaciers melt and, as a result, the sea level will rise. Maldives and Bangladesh, a sparkling country of 1,180 islands in the Indian Ocean, sits only three inches above water. And, if the sea level rises, most of these islands may be lost into the sea. For the countries like the Maldives, the Solomon islands, Samoa, Fiji and thousands of other small islands, some of them uninhibited, in the Pacific may just vanish because of warmer climate and water level rise caused by *El Nino*.

So far, the world is 0.25° warmer than in 1997 which was the warmest year on record. Scientists say the increase, though small, is enough to suggest that global warming has begun. According to the NOAA, "El Ninos are occurring more frequently and are progressively warmer. There is evidence to suggest that global temperatures may be linked to stronger, more frequent *El Ninos*." Sir John Houghton, co-chairman of the Scientific Committee of the International Panel on Climate Change, said the latest data on global temperatures supported the international scientific consensus that human activity might be making global warming worse. "These measurements are going in the direction we expect", he said, adding "if we really see that each month of this year (1998) is the hotter, it is pretty unlikely to be a *chance effect*. We think that the world is warming up because of the burning of fossil fuels and an increase in carbon dioxide level in the atmosphere. But, at present, we cannot prove this because of the variability of the climate," says Sir John, adding "*Deluge may not be nigh, but it is not improbable either.*"

About 10 million residents of Bangladesh will lose their homes and means of sustenance because of the rising sea level, due to global warming, in the next few decades. Where will they go? Whom will they displace? What political conflicts will result? That is only one example. According to some predictions, not long after

Bangladesh feels the impact, up to 60 per cent of its present population may have to be relocated. The pressure of the population at the foothills of the Himalayas has led in the last few decades to such extensive deforestation that the rains now rush wildly down the slopes, across Bangladesh and eastern India, carrying an enormous tonnage of topsoil to silt up the Ganga River system, causing floods. The Bay of Bengal is almost perpetually brown with the soil that ought to be growing crops. We are consuming larger and larger quantities every year of coal, oil, fresh air and water, trees, topsoil, and the thousand other substances we take out from the earth, transforming them into huge quantities of pollution, eager to lose ourselves in the name of culture, society, technology, and the rituals of production and consumption. We pay heavily

Let us examine what is the ecosystem as a whole whose protection is necessary for our survival. To understand the meaning of the word "*ecosystem*" and to appreciate the role that it plays in communicating man's increasing concern about his environment, one should consider the holistic concept that underlines the term. Holism is a concept based on the history that living components (organisms including man) function together as a whole according to well-defined physical and biological laws.

Also fundamental to this concept is a generalisation theory of integrative level or the theory of hierarchical control. By this, it is meant that as components are added to create larger functional units, additional attributes come into focus, the attributes that are not present nor evident from the behaviour of separate components. When hydrogen is combined with oxygen in a certain manner, for example, water, which is distinct from both of its components, is formed.

Similarly, when trees evolve together, they form forests with an entirely new set of attributes. To understand water and forest, therefore, knowledge about the functional wholes as well as the parts is required. The importance of the ecosystem concept is its emphasis on the overriding necessity for understanding the large units of nature in which man, his domestic organisms, and his energy demanding machines are interdependent components along with other essential units that maintain the total life support system.

The word "*ecosystem*" is a contraction of ecological system.

Ecology, in turn, is derived from the Greek word meaning "house". Persons all over the world, seizing on the root meaning of ecology, have broadened its scope from the former narrow academic confine and refer it to the study of the totality of man and environment or to the whole "*environment house*", as it were. The word ecosystem has been defined as regularly interacting and interdependent components forming a unified whole.

An anthropocentric, or human-centered, definition of ecosystem, therefore, could be: a life-support system composed of air, water, minerals, soil, plants, animals, and micro-organisms, all of which function together and maintain the whole. A formal definition is: any unit, including all organisms, biological factors interacting with the environment (physical factor) so that flow of energy within a system leads to a clearly defined trophic (nutrient requiring) structure, to biotic diversity and to an exchange of materials, between living on non-living sectors.

There is no size limit implied into the definition of the ecosystem; it may be a square km of jungle, a square meter of desert, a pond, a woodlot, a city, a farm or closed container of small organism (e.g. an aquarium or a vivarium). The largest ecosystem is biosphere, the entire world of life and its associated geosphere, the inanimate earth; because of its magnitude. This ecosystem is often referred to as the ecosphere. Only in man-made ecosystem are the boundaries clear; natural ecosystems blend together at overlap areas called ecotones, as at the end of a forest or at seashore.

The term ecosystem also indicates the unity of organisms and environment as well as the oneness of man and nature. An ecosystem has two components that are partially separated in space and time: (1) an autotrophic, or self-nourishing component (large green plants) in which light energy is used to build up complex organic substances from simpler inorganic one, and (2) a heterotrophic or other nourishing components in which complex organic substances are utilised, re-arranged and ultimately decomposed.

ISHO UPANISHAD'S VIEW

Environment is the sum total of all conditions and influences that effect the development of organisms. Every organism, be it



Forest is part of the life support system

bacterium, bird or beast, microbe, mould or a man, each of them needs an environment to grow. The Indian perception of environment, as is given in the *Isho-Upanishad*, is based on three elements and beliefs. First, the whole universe and its creatures belong to Lord (nature); second, no living being is superior to other; hence, one should not encroach upon the territory of the other. And, third, you cannot enjoy the beauty of nature with greed. The *Isho Upanishad* tells us that there has to be harmony between man and nature, a relationship based on compassion towards all living things, including animals and plants. This concept is enshrined in the philosophy of "*Ahinsa Parmo Dharma*", an attitude which was advocated by Mahavira, Buddha and Gandhi. The fact is that the whole system of nature is self-perpetuating and the only input is the sunlight. The rest of things follow. Kautilya, the wise minister in the court of Chandragupta Maurya, said: "The stability of a country is dependent on the stability of its environment." This was the message which made the slogan of World Conservation Strategy (WCS) of the UN.

Warning against the degradation of nature, Jawaharlal Nehru

said: "I wonder how much thought is given before a project is launched to having an ecological survey to find out what the effect would be on the drainage system, flora and fauna of that area. It would not be desirable to have imbalance in nature." But the appeal fell on deaf ears. No wonder our cities are choking and urban life has become a constant conflict with nature.

THE CARRYING CAPACITY

The environment provides the life support system, called the "carrying capacity". For instance, India has 229 million hectares of land which can support certain number of people whatever the level of technology application. Beyond that, the system will fail and civilisation will collapse. In Japan, for every acre of land, there are 200 people. The US is a super powers not because it has huge stockpiles of nuclear arms, but also because it has large natural resources base; the Americans are the drawers of water and hewers of wood, as it were. Japan, with its narrow base, sought to become a great power and fought the World War-II and lost it. So did Germany. Trade surplus and electronic goods don't produce super powers. It has to have land, water, forests and people to preserve them. For that matter, India, China and Russia have the making of super powers. And not Singapore, Hong Kong and South Korea which have no physical base to support their great power claim, although they have wide industrial base.

The modern concept of environment and its preservation has come to us through the West which has been constantly in conflict with nature. The Westerners say that civilisation itself is a conquest over nature. Hence, building large cities after destroying forests and mountains, throwing effluents into rivers and polluting air by spewing forth toxic gas are the conditions of modern life which cannot be avoided. The West does not know how to limit its demand and this led to Rio meeting June 1992. But, it is not necessary that what is good for the West is good for the East. East and West never meet; they never did. The environmental life support system in India has been much larger than in most other countries of the world which is why our large population. But, the limit has reached now. Therefore, we cannot argue that every child is born with two hands and only one mouth to feed. The planned use of environmental sources is the only way to preserve the viability of the country. Or else, there will be a deluge.

A GLOBAL ISSUE

The most important issue of the world today is the environment, the destruction of which has threatened the survival of this planet. Environment came on the world's agenda after it was discovered that the growth, and a very reckless one at that, has taken place at the cost of nature whose capacity to meet man's needs is limited. Since growth is resource-based, the higher the growth in terms of human consumption, the thinner the support-line to sustain it. Population, mostly in the Third World countries, doubled during the last thirty years and the frightful technologies to exploit nature's resources diminished the possibility of human civilisation lasting forever. It seems that the limit to growth has reached when the earth may split to end in deluge and things may begin all over again. The rich countries of the world are so frightened that they called together 50,000 persons from over 100 countries in June 1992 at Rio de Janeiro (Brazil) to find ways of averting this disaster.

The Earth Summit, formally known as United Nations Conference on Environment and Development (UNCED), approved *Rio Declaration* as non-binding embrace on environment principles at its meeting at Rio de Janeiro (Brazil) in June 1992. It recommended in the Agenda-21 that countries take action on environmental concerns from polluted water to over-population; a climate treaty to control gases that cause global warming and a biodiversity agreement would attempt to halt the loss of plant and animal species.

The rich nations, which are destroying the ozone layer (a thin curtain of gases that prevent harmful sun rays from coming to the earth) by CFC (chlorofluorocarbon) said they would never do it again. Strangely enough what affects the West becomes the chief concern of the world and what affects the poor in the East remains the unreported stories at global conferences! The poor countries do not release CFC gases in quantities large enough to damage the ozone layer, nor have they been plundering the earth the way rich nations do. But they are associated with this global effort to save the earth. It is good, but the environmental problems of poor countries should have also been addressed by the rich at Rio mega conference. The major concern of the poor countries is sanitation that largely consists of water supply and the human waste disposal systems.

SANITATION AND ENVIRONMENT

These are the two sides of the same problem; one cannot be solved without solving the other. Sanitation has many linkages, most important among them being water supply, personal and community cleanliness and safe and hygienic systems of human waste disposal. Sanitation ensures a productive life, the lack of which creates poverty which is the greatest polluter of environment. Putting it simply, sanitation is not only keeping clean but protecting those sources of environment which support sustainable development. And, to that extent, reducing dependence on the "global commons" which are already under pressure. The fast deterioration of environmental and ecological balance specially in developing countries has become a matter of deep concern. Population explosion, urbanisation, industrialisation, felling of trees, erosion of soil and an ever-increasing number of vehicles and factories are the main causes of this imbalance. Sulabh is concerned about these matters no less than anybody else. But over and above all these, another major cause of imbalance, which is particular to India as well as many other developing countries, is the centuries-old sub-human and unhealthy traditional practice of open defecation and the use of bucket (or dry) privies cleansed manually. Due to cleaning of the privy chambers by pouring water through the squatting holes and defecation by children in open drains (many a time by adults also), excreta flows into drains running along the houses exposing the entire locality to health hazards and foul environment.

The immensity of the problem can be gauged from the fact that out of the world's total population of 5.7 billion (1994), three billion people either defecate in the open or use unsafe and unhygienic latrines. In India alone, as has been mentioned time and again, 700 million people out of 950 million population either defecate in the open or use insanitary bucket privies cleaned manually. In China, family members themselves carry human excreta and dump it at common ground while in Africa pits are dug into the ground to be used by the people. Both the systems are unhygienic. If the Chinese do not get the sanitation-related diseases as in India, it is partly because of the fact that they use hot water. In Africa, the sanitation level is very poor with bad consequences. Rwanda in central Africa is one recent case where 30,000 refugees died by stomach related diseases caused by in-

sanitation in two months (July, August 1994). Human excreta is the cause of many enteric diseases such as cholera, dysentery, typhoid, paratyphoid, infectious hepatitis, hookworm, diarrhoea etc. Over 50 infections can be transferred from a diseased person to a healthy one by various direct or indirect routes from excreta. Therefore, safe disposal of human excreta, as underlined earlier, should be the primary objective of improved sanitation to build a healthier nation and provide a cleaner environment.

In sum, the term ecosystem indicates the unity of organisms and environment as well as the oneness of man and nature. No wonder, on the ecosystem turn the survival of humankind who seem to be ignoring the storm signal at the distant horizon. ●

The limits of a country are determined by ecology and the intelligence of a society.

- Homer Dixon

Ecological limit to growth

Plato lamented the destruction of soil and forests in ancient Greece; Dickens and Marx were worried about awful conditions created by the *Industrial Revolution*. In the *Vedas*, human beings have been asked to worship the earth, moon, and the sun that constitute the last posts of our existence on this planet. The United Nations Conference on Human Environment, held in Stockholm in 1972, very sharply identified these boundaries within which man has to learn to live. We have always believed that there is plenty of air to breathe, plenty of land to grow crops, plenty of water to drink and irrigate, but the Stockholm conference said: "No". And, our dream of a plentiful world came crashing down.

Since then, man has been searching, harder than before, for the sources of sustenance in case everything fails. The attempt to improve the environmental condition all these years has,



Deforestation leads to soil degradation and climate change

however, been only cosmetic. The developed West is more concerned about ozone layer, CFC and Green House gases. We are concerned about them no less. However our concern for the poor, who have not been given a fair deal in the distribution of resources, is greater. It is true that we want to preserve forests and, truer still, that we want to expand the areas under forest cover. But, we have also to look after the people who live on forest products: wood, timber and fruits. They are the people who live on the fringe of existence - away and isolated from society, largely illiterate, undernourished, poor and exploited. If we take them away from forests, they will lose their living, possibly their lives. This is one aspect of the story. The other aspect is that we cannot allow them to plunder our forest resources and allow fossil fuels to be squandered, whatever our compulsions. Between the two extremes, lies the area of our activities and this is where we have to pool our resources, intellectual and material, to find a solution to the problem of deteriorating environmental status. Fossil fuels are limited. The forests, oil, and coal will run out, may be sooner than most of us are willing to believe. In which case, what do we do? And where the energy and other things will come from? This unanswered question haunts mankind.

POPULATION BOOM HURTS GROWTH



Too many mouths to feed

The impact of population growth on India has been enormous and the number of people below the poverty line increased from 16 crore in 1951 to 33 crore in 1997 and the number of illiterates increased from 23 crore in 1951 to 34 crore in 1991. The average per capita foodgrain production has come up to only about 200 kg per year as against the

required minimum of 300 kg per year. The number of unemployed increased from 2.3 crore in 1992 to 5.8 crore in 1997, that is, during the eighth Plan in which employment generation was the thrust

area. It is estimated that at this rate the unemployment figure will be over nine crore by the year 2002. The per capita commercial energy consumption in India increased from a lowly 111 kg of oil equivalent in 1971 to a mere 242 kg of oil equivalent in 1993, whereas the corresponding values for China, Thailand and Malaysia have been from 278 to 628; 178 to 678 and 436 to 1,529 kg of oil equivalent. But the apologists of India's good progress prefer to look at the changes in the "rates" of

illiteracy and poverty and not in the absolute number of poor and illiteracy rate (i.e. the ratio of illiterates to the total population) which declined from 44 per cent in 1951 to 36 per cent in 1997. The apologists emphasise that since the foodgrain production has gone up by almost three times since Independence, India's performance in the field of agriculture has been commendable. The achievements in the field of power generation too are appreciable because the installed power generation capacity in the country has increased from 1,400 Mw in 1947 to 85,940 Mw in 1996-97.

All these assertions are factually correct, but conclusions are misleading. For example, the much touted decline in illiteracy rate simply indicates that population is growing faster than illiteracy in India. It is true that our foodgrain production has almost tripled since Independence but look at our foodgrain productivity, which despite all the euphoria of our Green Revolution, is a mere 1.6 tonne per hectare and is only one-third of that in many developed and even developing countries. No wonder our foodgrain production has not been able to provide any significant rise in the per capita foodgrain availability for the growing population which has increased from 34 crore in 1947 to 95 crore now. We are able to export foodgrains simply because one-third of our population remains partially starved. The causes of most of our failings are: (i) neglect of school education; (ii) failure to control rapid population growth, and (iii) discouraging competition, enterprise and excellence by imposing the policies of

| VITAL SIGNS | ENOUGH TO EAT |
|---|---------------|
| An average adult, needs 2,200 calories a day to avoid malnutrition. The food supplies in most countries exceed that minimum | |
| COUNTRY | CALORIES* |
| USA | 3603 |
| Germany | 3265 |
| Mexico | 3136 |
| Canada | 3093 |
| Slovakia | 2892 |
| Japan | 2887 |
| Brazil | 2834 |
| China | 2734 |
| Vietnam | 2463 |
| Kenya | 1991 |
| Source: Food and Agriculture in the United Nations; 1995 figures | |
| *DAILY CALORIES PER PERSON | |

“permits and quotas”. Of these, the population rise is the single most critical reason for poverty in India. This has also resulted in migration to cities, resulting in growing slums in cities, insanitation, poverty, disease and death.

It is strange that the five billionth child of the world, *Matej Gaspar*, was born in Yugoslavia on July 14, 1987, and not in India or China which together account for almost 40 per cent of the global population. Quite understandably, the then UN Secretary General Perez de Cuellar rushed to the hospital and on behalf of the *homo sapiens* of the planet wished Matej Gaspar good luck. Most certainly the child needed it. The Reverend Thomas Robert



Food is the issue

Malthus, a non-practising English clergymen, said, way back in 1798, that mankind would always tend to be victim of his own fecundity. But his prediction was dismissed by economists as an anguished cry of a sexually overcharged man. (Malthus was a free-wheeler who married at 38 a girl

who was ten years his junior and bore him three children, one of whom died young.)

That was soon after the death of Adam Smith in 1790 when Malthus was engaged in polemical battle with his friend David Ricardo on the issue of population and growth. Ricardo, who later provided handle to Marx and Keynes alike to hold out their theories of value and free spending, went a step ahead and said that no compassion should be wasted on labour who bred faster than the increase in their wages could support and that increase in wages would mean increase in population. Hence, Ricardo argued that any effort to increase wages by governments and unions and rescue people from poverty would come in conflict with the economic law of keeping *population low and income high*. Those were the protagonists of the theory of survival of the fittest. And

that was the time when the issue of population control for economic growth was first mooted with seriousness. In few matters of life there is gap between dry and antiseptic theory and its application is also very marginal.

During Malthus's life-time (1766-1834), the Irish population first doubled again-all within 60 years (1780-1840). But then there were vast prairies of North America and sparsely populated land in South America and the New World which provided sanctuaries to adventurers fleeing the fast over-crowding Europe in search of land and gold, both of which were available in plenty there. To be true, it took two million years to generate 250 million people in the world at the time of Christ. It took 1,830 years to attain the first billion; 100 years for the second billion and 30 years for the third billion and fourth billion was reached in 1975, taking only 15 years. The fifth billion was reached on July 14, 1987. The present population is 5.7 billion as declared at the Cairo Conference in 1994.

| Population growth rate in per cent | Doubling time in years |
|------------------------------------|------------------------|
| 0.1 | 700 |
| 0.5 | 140 |
| 1.0 | 70 |
| 2.0 | 35 |
| 4.0 | 18 |
| 5.0 | 14 |
| 7.0 | 10 |
| 10.0 | 7 |

Experts estimate that the world population may reach 12.4 or even 14 billion by 2050 before it stabilises; the figures which can make nonsense of all calculations about preserving the environment clean and healthy. Ninety per cent of the population growth has been taking place in the poor countries of the South and that is why the countries of the North blame the South for the present state of deterioration in the planet's environment.

In the past 100 years, during which the population doubled thrice, world's resources have continued to deplete rapidly besides environment pollution. Little does man realise, it seems, that the world is finite and shoved into the boundaries fixed by the earth, oceans and the air. The capacity of the biosphere to absorb human waste is limited like that of the land and the oceans to provide

food to the growing population. A computer-based study by economists has set the deadline (20) when civilisation will have lived out its glorious days and a decline in growth rate would begin. The study has set the West counting its days, putting out chilling details about the



More mouths for food to do full round

fast depleting non-renewable resources. Most economists agreed on the statistics of the computer study but disagreed on the conclusion drawn from them. The dissenting economists said that man's ingenuity is the best guarantee of his survival. The fall-out of this geometrical rise in world's population has a shattering effect on jobs, inflation, food supply, environment sanitation as also on world's peace. Cities and villages are choking with people, global weather is affected by burning fossil fuels and denuded forests, cities are stinking and new areas of conflict are emerging as the population squeeze is tightening on the fast shrinking resources of the world. The redeeming feature of the growth in population and GNP has been ironical. The poorer the country, the higher the population growth and lower the growth of GNP. Apart from biological reason (starving rats breed faster than the well-fed ones), this situation is attributable to man's sexual urge which increases in condition of want and scarcity. A quick growth analysis will bear it out.

The average rates of GNP growth per capita between 1961-68 were: the USA 3.4 per cent (GNP per capita \$ 3,980); Japan 9.9 per cent (\$1,190); West Germany 3.4 per cent (\$1,970); the USSR 5.8 per cent (\$1,00) against China which showed growth rate at 0.3 per cent (\$ 100); India 1 per cent (\$ 100); and Nigeria 1.13 per cent (\$70). During the same period, the population of India rose by 2.5 per cent to 524 million (India's present population is estimated at 900 million); Pakistan's by 2.5 per cent to 238 million (both wings included), China's by 1.2 per cent to 730

million, West Germany's by 1.0 per cent to 60 million and the US population grew by 1.4 per cent to 201 million. The uneven growth in population and resources has left two-thirds of the world perpetually hungry.

On this shoulder-to-shoulder planet, 500 million people are malnourished; 1,000 million people do not have clean water to drink; 800 million people do not have jobs or earn less than \$ 50 per year; 500 million live in slums and more than 1,500 million people do not have basic health facilities. And nearly all of them live in the poverty belt which girdles half the globe, from *Sahara to Saigon*, taking into its grip about two billion people, 800 million of whom are in the process of dying a slow and lingering death. The countries in the poverty belt, nearly 100 of them, have 70 per cent of world's population, 80 per cent of world's population growth but only seven per cent of world's world's wealth. To make mathematics simpler, if the world is imagined as a global village of 100 persons, 58 of them are Asians, 13 Africans, 10 Latin Americans, nine Europeans, five Russians and five person are North Americans.

At present, less than 30 per cent of world's people have more than 70 per cent of world's resources at their command. According to World Bank economist Hollis Chenery, the income share of the poorest 40 per cent averages only 12 per cent. Pakistani economist, late Mr. Mahbub-ul-Huq, who was associated with the UNDP, argued that one per cent increase in the population of the rich put eight times as much pressure on resources and pollutes environment. In India, the annual consumption of the richest 25 million is greater than that of the poorest 150 million. The massive growth in population has resulted in a fall in land man ratio in Asia from 0.26 hectare per person in 1975 to 0.23 hectare in 1975. And land fragmentation is continuing.

Sounding alarm about the deteriorating situation, Asian parliamentarians and FAO experts said that human needs have already begun to outstrip the productive capacity of biological systems. Quoting the US Bureau of Mines, FAO experts said that world's reserves of chromium ore are about 775 million tonnes. At the present rate of consumption, oil will last 450 years but the consumption is increasing at a rate of 2.6 per cent which means it will run out in less than 100 years. Similarly, gold deposits will last for 11 years, copper 26 years, silver 16 years, zinc 23 years and petroleum, which is the lifeline of industry, will run out in 30 year or less. Since the new discovers of oil and minerals cannot

meet the additional demand, the date with disaster may come sooner than many are willing to believe. Ecological pollution is another threat to civilisation. The matter discharged from factories are never lost; they are dispersed and rearranged; in the air, soil and water. But when effluents are discharged on a very large scale, the absorptive mechanism becomes saturated. It does not work. Major illness linked to air pollution are emphysema, bronchitis, asthma and lung cancer. Nuclear discharge beyond a point can set the biosphere ablaze. (Source: *Club of Rome*).

The population "bomb" has hit the food front hardest. The cause of food crisis is largely attributable to the rise in population. The hungry countries of the world include the Sahel (which means the "fringe" or the Sub-Sahara region). The Sub-Sahara region comprises Mauritania, Senegal, Mali, Niger and Chad. India, Pakistan, Bangladesh and the other countries of South-East Asia are no less affected by food crisis caused by baby boom. We have our godowns bulging with grains but people are dying of hunger. There is a recession in textile market, but poor women are struggling to hide their womanhood.

According to International Food Policy Research Institute estimates, there is a net deficit of between 120 and 145 million tonnes in staple foodstuffs, i.e. rice, wheat and coarse grains. FAO has repeatedly warned about the fast declining food stock. The world food reserves which in 1961 were enough to feed the world for 95 days is depleted now to last for only ten days. The over stock of cereals at the end of 1975-80 is likely to decline to 225 million tonnes, ten million tonnes below the average opening equivalent to 17 per cent of world's consumption against 19 per cent last year. The entire decline is recorded in the hunger belt. The Asia, Pacific Food Conference held in 1992 in Delhi abundantly made it clear. India's case is of mixed fortune; even while the country has come a long way from 1973-75: when it had to import 5.5 million tonnes of grain every year to avert famine but became exporter in 1977. It will, however, face a shortfall of 6.9 million tonnes of grain during the next season - population growth rate being what it is. The 30 million tonnes of grain reserves, of which the government boasts about, is the stock which the people could not buy. In other words, the calorie intake level, which is necessary to maintain the health of a nation, was not achieved. Hence, this surplus.

The present grain production in India is not enough to meet the full calorie needs of the people who constitute 16 per cent of

the world's population living on one-fortieth of world's total land area. In the first half of the century, the population growth rate was low because the death rate was high. Since 1951, about 27 million people have been added to the population. The present annual increase of 12 million people (daily births 58,000 minus daily deaths of 25,000 people is equal to the daily increase of 33,000 people) is roughly like adding the entire population of Australia, which is 2.5 times as large as India, every year.

The increase in population has virtually cancelled out the benefits of the Green Revolution, which has kept the people alive without growth. Poverty is the absence of growth and lack of demand over adequate resources and services to housing, clothing and medical aid. Broadly speaking, subsistence with minimum provisions to maintain health and working capacity forms the primary yardstick to determine the point where growth ends and poverty begins. According to the Planning Commission, for the satisfaction of the basic needs, a person requires a monthly consumer expenditure of Rs. 61.80 in rural areas, and Rs. 71.30 in urban areas at 1976-77 prices. Taking this as the poverty line, the number of people below this infamous line in 1977-78 was 290 million of which 70 per cent lived in villages and 30 per cent in cities.

During the last 100 years, when the population grew fastest, the growth in world economy did take place. But a country's economy has to grow faster than its population to leave real income with its people to spend on consumer goods. For instance, India has to produce goods and services at a rate higher than 2.2 per cent to create real surplus with the people. This has not been achieved except during a brief period in mid-1970s when the growth rate was five per cent and above. This has been the case with most of the developing countries except with those in West Asia where the growth pattern is artificial because of oil boom which has kept them in great company of rich nations. The difference between a stagnant economy (i.e. an economy that grows as much as the number of the people it is to support) and a developing economy is forbidding. The growth in the US economy at 2.4 per cent against India's 0.9 per cent, is many times more than the differential 1.5 per cent because of the level of investment. In the US case, population growth is very marginal against India's 2.2 per cent with the population base of 900 million people. So, the population growth cuts in two ways. First, it produces more mouths to feed and, second, it cancels out whatever growth is

achieved in the economy.

Population control is not only necessary but it is pre-condition for survival. With five per cent of world population consuming 20 per cent of its resources, the prosperity of the US is not much of a mystery. The US holds key to the survival of the world not only because of its nuclear power but also because of its "grain power"; it is world's drawer of water and hewer of wood.

GRAIN PRODUCTION

In the three major grain-producing countries, the grain fed to the cattle can be enough to feed 8.8 million hungry people in the world. These nations can starve the developing countries into submission. That was what had happened before Dr. Norman Borlaug developed the famous Mexican variety of wheat which changed the face of the world in a more substantial way than any inventor or conqueror could do since Newton was lowered into the grave. The failure on the population front is largely because of illiteracy, poverty and lack of medical facility or simple refusal to change. The attitudinal problem is most intractable in the developing countries. If by any miracle India's population could have been frozen at 430 million in 1947, the per capita GNP would have been closer to those in many developed countries. In the fifties, when the nuclear capability was the currency of power, the world was divided into pro-Moscow and pro-US groups. The issue was protection. The Dullesian era of the sixties was marked by the raging cold war when industrial capacity was the measure of strength with the entire Third World up for the grab. The issue was prestige. By the end of 1980, when the planet is groaning with the bulging population, posing threat to the limited resources of the world, the issue is survival.

Unemployment, inflation, violence, recession and agitations - name any problem and we have it. It is entirely because of the fact that at the present level of development, any kind of stability, political, economic or social, is well-nigh impossible. Instead of strengthening the police, we would do well to regulate the population growth and boost economic growth by investment and private enterprise, public units having failed to deliver the goods and achieve the "commanding heights". In that case, everybody will have something to lose in conditions of chaos and violence. "Give a rioter a piece of land and he will be a disciplined man", said Adam Smith. Place de la Bastille would not have fallen had

the agitators had tenements in Paris. Poverty has the tendency to perpetuate itself. And once it is done no industrial progress is possible. In principle, there are four ways to break the "equilibrium of poverty", to use the phrase of Nobel Prize winner Gunnar Myrdal.

One, to establish a happy and livable relationship between land and, people; two, alter the land tenure to reward the efforts of the people with what they produce; three, persuade or coerce the people to breed less. And the fourth solution is to ask the people to just disappear. If the land supply is insufficient, the last two solutions will only serve.

In Sutherland (Scottish Highland), the equilibrium of poverty was broken by forthright expulsion of people and the burning of their villages so that they could not return to them. Agriculture then would be based on wool and not land. This ushered industrialisation. At the beginning of the present century, 38 per cent of Americans were employed in agriculture; by 1975 this was reduced to 4 per cent. In Britain, it is 2.5 per cent, in Italy it is 16 per cent. Against that, in India the total number of employed, under-employed or unemployed in agriculture constitute the forbidding 72 per cent of the total population.

A massive switchover to industry and control of population, by persuasion if we can, by coercion if we must, alone can prevent the ghost of Malthus stalking the world again. Industrialists should be called the builders of the nation, crusaders and the saviours of poor in order to encourage them to industrialise the country. Or, even if we manage to live on this planet for a few more centuries and the doomsayers are proved wrong, as we would like them to be, the problem would not be so much of the agony of slow and lingering death for millions in conditions of non-growth but of the character of the world we would leave behind. The problem of regulating population and speeding up growth may be formidable but the consequences of their neglect would be too terrible to contemplate.

POPULATION AND THE ENVIRONMENT

There is a direct correlation between population and environment; no wonder we find large population shifts as environmental refugees abandon degraded lands and move elsewhere in search of jobs and sustenance. The 1994 report on world population, prepared by the United Nations Population Fund (UNPFA), which gives details

on the environment and population after the Earth Summit, has predicted that the number of "environmental refugees" will increase markedly over the next 35 years. "Environmental refugees" are the people who have been living until now in "critical zones" which for years have been unable to adequately feed their populations either because the soil in their area is exhausted or because there are too much arable land and pasturage. The FAO estimates that there are 165 billion people in such "critical zones," where at best only 600 million people could survive on a marginal agricultural industry.

This includes the main highlands or mountainous areas with difficult climates, of arid or semi-arid areas such as north-eastern Brazil, the Sahel Zone or the arid regions between Namibia and Mozambique in Africa, the Yemen and the Deccan region in India. In 1975, the FAO reported that many of these regions could only adequately support a third of the people living there, in some regions only about two-fifths. What does the situation look like now after 25 years of enormous population growth? For many people there is not much else they can do but leave their homelands. They become "environmental refugees" without being recognised as refugees under current international regulations. The number of "environmental refugees" could be increased enormously due to climatic changes which are threatening. For instance, when sea-levels rise due to melting ice, and low-lying marshlands and fluvial plains, such as the Nile Delta or extensive areas of Bangladesh, are flooded.

People overexploit environment by their limitless needs and the garbage they produce. The consequence of the population explosion has been an explosion in consumption. Reserves of important raw materials are much greater than was originally estimated, but they are not inexhaustible, and there has not been so much consumption as there is now in the whole history of mankind. The consequences are still unknown because the consumption explosion only took place a short time ago. The "*Consumer society*" came into existence in the 1920s. World economic crises and the Second World War hampered it from extending until 1945. By the end of the 1940s, for instance, one in four households in Britain had a washing machine and one in five a refrigerator. The population of the world was then only 2.5 billion. There are at present 5.7 billion people and at the end of this decade it will be 6.3 billion, ten years later 7.2 billion and in

the year 2025 an estimated 8.5 billion. The number of refrigerators and washing machines in use has been increasing almost as rapidly as the population. In addition, consumer goods are much cheaper than they were at the end of the 1949s. Thirteen per cent of households in Malaysia which would be categorised as poor can today afford a refrigerator. The report on world population states that it is possible that our rapidly increasing population will require twice as much unrenovable raw materials in the next two decades as is needed today.

Supplying the population with renewable resources such as land and water will also become difficult. At present, we consume more renewable resources than can be replaced. Much land is exhausted, transformed into steppe, salted up or eroded. There are so far only vague estimates about how much land is affected in this way. In Africa 40 per cent of the cultivable soil had lost more than ten per cent of its productivity because of excessive cultivation. When soil has lost more than a half of its production potential it is described as suffering from "severe degradation". In the mid-1980s, 17 per cent of the arable land in Africa was affected in this way; 16 per cent in Asia and ten per cent in Latin America. The "developed world" did not do so badly with only seven per cent of the arable land being affected in this way. Nevertheless, crop yields have increased almost everywhere due to the increasing use of artificial fertilizers. But artificial fertilizers can only compensate for the loss of natural soil fertility for a limited period of time. If they are used too intensively and for too long the residues turn up in the ground-water, in rivers and streams. In some countries, in the Netherlands for instance, the use of artificial fertilizers has had to be curtailed to protect the environment. In the long-term, then, artificial fertilizers are not the answer to ensure food supplies for an increasing population.

Where then will the arable land come from to feed the increasing population? In 1988, there was 0.29 hectares of arable land available per head of population. But this land was unequally distributed. People in the Third World had to be content with 0.21 hectares of land per head of population, but people in the industrialised countries had 0.55 hectares. By the year 2050 the population will have increased to such an extent that there will only be 0.165 hectares of arable land available per person - equivalent to an allotment measuring 41 metres by 41 metres - unless 2.75 million square kilometres of new land is made

available for agricultural purposes. Should harvest yields remain steady, then more land will also be needed for homes, road building, for industrial estates and similar facilities.

EXHAUSTED LAND

According to a United Nations report, such an enormous requirement will only accelerate land exhaustion. There is hardly suitable land in any parts of Asia, in the Sahel Zone and in East and North Africa. If mankind turns to land in the Steppes, in the mountains or in the rain forest, there is the danger that it will be lost again through erosion. According to the UN report, only a slower population growth could improve the situation.

The position is no less critical as regards water supplies and sanitation. Mankind needs water for almost everything: for producing food, and energy, for drinking and for personal hygiene. Consumption is increasing rapidly; water has already become a scarce commodity even in advance countries. Water shortages will place limits on the development of many countries in Western Asia and Africa. Under the heading "*Population and Climate Changes*" the world population report comments succinctly: "Population growth fundamentally contributes to the green-house effect and thus to global warming." Population growth in Africa is held responsible for 68 per cent of increase in carbon dioxide emissions between 1980 and 1988. In Brazil 76 per cent of the increase in emissions was attributed to population growth and 42 per cent in Indonesia. Methane or marsh-gas, is also said to be damaging the ozone layer. More and more methane is being released into the atmosphere as cattle herds increase to match the population growth and with the extension of rice fields. But rice production must be increased so that the continuously increasing population growth in the rice-growing regions can be fed. Scientists at the International Rice Research Institute in the Philippines are growing a species of rice, aided by gene technology, which produces less methane gas. But cattle continues to emit the gas into the atmosphere. Here again, a slowing down in population growth would reduce the difficulties and make it easier to cope with them.

If we could have somehow retained the population at the 1947 level, the growth since then would have made India one of the major powers of the world. But, this did not happen and, hence, all our problems and miseries. ●

"A good newspaper is like the nation talking to itself."

Media and environmental sanitation

Information is power. The most informed nations are the most powerful ones today which rule the world not as Caesar did but by subtle methods of managing the news and information; or monitoring them to suit their interests. Through the monopoly over knowledge, the powerful nations also control information about science and technology which is the basis of modern civilization. Social changes, political upheavals and economic reforms are brought



Media-eye

about by information (or disinformation) transmitted and beamed across the globe through radio, TV, cinema and newspapers which have reduced the world to the size of the newspaper you read. Or, the TV you watch.

It was not so before. For instance, Galileo (1564-1642), Italian astronomer, was the first to say that the sun is fixed and the earth is moving, a concept which was against the principle of Ptolemy on which the Holy Scriptures of Christianity was based. Galileo's discovery was declared heretical by the Pope as it was against the Bible. He was inquisitioned and made to recant. But he told his friend: "These beautiful heavens, this beautiful earth, this universe which I had watched all my life are lost to me forever. But, my friend, after I am dead, tell the world that the sun is fixed and the earth is moving." Galileo was right and the Pope is wrong. (Incidentally, the Vatican accepted only in January 1994 that Galileo was right, more than 400 years after his death.)

There was no press in those days and, hence, it took centuries for the world to be convinced that the entire Christian world was wrong and the blind Italian astronomer was right. But, it is not so now; in half a second, you'll know if the President of America sneezes, or a cliff had slipped in Caledonia in South

Pacific when the casualty was only a chicken. It is amazing but true. In larger areas of human endeavour, the growth and development cannot be achieved until knowledge and information are allowed to travel freely. And, fast. The Press in India came 100 years too late. James Augustus Hicky, an East India Company clerk, brought out a two-page weekly, called *Bengal Gazette*, which began its publication on January 29, 1780. Its only job was to expose the sex scandals of the Company's employees and that of the Governor-General Warren Hastings, and his wife who loved everybody except her husband.

Quite predictably, Hicky was dismissed by the Company and thrown out of India into a British jail from where he continued to write for his Gazette until he died a poor and sick man. Hicky was dead but his paper flourished and soon the news spread like a wildfire in Calcutta, then the capital of India, that the British clerk died in bondage so that the Press in India could be free. More than 200 years after Hicky's death, we cannot claim to have outdone him in sacrifice for the freedom of the Press. We still swear by Hicky while condemning the British rule in India, a strange paradox of which history of India is made of.

Media is the most credible source of information and knowledge on macro and micro areas which together constitute conditions of growth of a society. Now, there is explosion of information and our media, despite their many failings and flaws, is the only assured and instantaneous source of information which is the building block of modern society. May it be conservation of the environment, making peace or waging war - the media first prepares the ground for the people to march in unison. With the help of media, Hitler fought a global war and again with the help of media, President Roosevelt of the US brought peace by setting up the UN. And, when the media failed to support the League of Nation, World War-I broke out on a simple incident like the murder of Archduke Francis Ferdinand at Sarajevo on June 28, 1914. And almost one generation perished in the global conflict.

So, while talking of the role of media and its relations with environment, one is talking of the survival and growth of life on the planet. In sum, the media decides whether or not you and your country will grow; whether or not we'll be able to save life on this planet for our children and children's children. This is briefly what the media is all about. Now, let us talk about environment.

The environment is the life support systems, the hills, the mountains, rivers, land, sea, forests and flora and fauna, besides the historical experiences acquired through ages. And, the limit to which they can be used without destroying ecology. The media transfers knowledge and information on all these ecological factors from one corner of the earth to another. Obviously, our demand on environment is increasing far beyond its capacity to support it. In that event, the media, through exchange of knowledge of science and technology, will provide solutions and cry halt when the limit to growth is reached. In case of Ganga pollution, it is the role of media that has worked. During his visit to India,

Mr. Maurice, the Strong man behind Earth Summit

Mr. Maurice Strong speaks as people from the Third World do. He says that polluters must pay. It is not right to say that the poor

Today is celebrated all over as World Environment Day. Given below is the text of the UNEP's message on the occasion, as articulated by Elizabeth Dowdeswell



On 5 June, we celebrate World Environment Day - a day to bring the world together.

different national governments, to people who bear no resemblance to each other, to cultures alien to one another. It is the message of the sanctity of Life on Earth. And this is the theme for this year's World Environment Day: "For Life on Earth, To a vision from another planet the world would

live on earth. By throwing joint weights into history's on the right side, we can balance in

THE ECONOMIC TIMES NEW DELHI
MONDAY 28 JUNE, 1988

AT SEA WITH POLLUTION

Mahendra Pandey says that the world community has a considerable burden to bear in reducing marine pollution

French President Francois Mitterand had offered help in cleaning the Ganga, the lifeline in northern India. The Central government had already made a Rs. 250 crore Ganga Action Plan but the amount was not enough to complete the job. Earlier, the Thames in London and the Rhine in France were cleaned at forbidding costs. The media blitz alone brought help for the Ganga clean-up plan and also for many environment projects. Preserving the environment is no more a cosmetic concept, nor a high fashion to be talked in clubs. It is the issue on which the country will stand and fall. With the growth of cities and towns following a large-scale exodus from villages and the consequent proliferation of slums, different kinds of problems have arisen, not always of the sewerage system which, of course is very, major one but one of constant fight for more oxygen in the air to breathe and more

space to live and play. The crowded life in villages has different dimension, the most distressing of which is the shrinking land area, the rapidly rising population and the consequent mounting pressure on the environment.

The United Nations Conference on the Environment Development (UNCED) in June, 1992 at Rio de Janeiro was the greatest environment - media event of this century when leaders from more than 100 countries and 30,000 other participants gathered at the Brazilian capital, united in their effort to save the Planet Earth. The central premise of the unprecedented *Earth Summit* was that the environmental problems could no longer be solved at the national level alone; global initiative was also necessary. If the size and ambition were the measures of success, the Earth Summit, which took two years in preparation with Mr. Morris Strong in the centre of the show, was the largest and the most complex global conference ever held - bigger than the meetings held at Versailles, Yalta and Potsdam which carved up empires, drew new boundaries and settled world wars. And, no more. But the Earth Summit Agenda-21 was more far-reaching in impact; for, it set the more pressing environmental problems on the agenda, including the problem of global warming, deforestation, biodiversity, poverty and underdevelopment. The first Earth Summit was held at Stockholm in 1972, also organised by Mr. Morris Strong, which also produced a media wave that set off environmental reforms at national and international level.

If this kind of media coverage would have been there earlier, Galileo would not have had to recant his views and his followers would not have had to be burnt alive at the stake after inquisition. In sum, the media power is the most crucial development of this century, a power which destroyed the Soviet empire without a bullet being fired and a man being killed. Hence, promoting the environmental sanitation through media has been the consistent policy of the Sulabh Sanitation Movement in India.

Sharing knowledge through media is another way to save the environment of this planet and preserve heritage of man. The naked hills of Greece, Syria, Lebanon and Palestine tell the story of human greed and the lost Mesopotemian civilisation, which flourished on the bank of rivers Tigris and Euphrates, is an evidence of the fact that if there had been a media network, these could have been saved. And, the world would have been a happier and better place to live in. ●

**Sufficient measure of civilisation
is the influence of good women.**

- R.W. Emerson

Women are prime movers of Sulabh Sanitation Movement

Concern for advancement of women has underpinned Indian planning and polity, specially since Independence. From the feminism of the sixties to the introspection on women's status in the seventies, to *women-in-development* debates of the eighties and to the focus on gender issues in the nineties have been a momentous transition. From women's problems to women's issues and finally to women's perspectives - there has been a whole re-shaping of paradigms of development. The Constitution not only grants equality to women but also asks the State to adopt measures to help them grow. The Constitution also imposes a fundamental duty on every citizen to uphold the dignity of women. In 1971, the Government of India appointed a *Committee on the Status of Women* to examine all questions relating to their rights and status in the changing social and economic conditions in the country. The 73rd and 74th Constitutional Amendments (1993) guarantee women a minimum of one-third representation in all local bodies, both in the rural and urban areas, and also reserve one-third of all posts of chairpersons for women. However, despite all these women are the largest section of the population living in absolute poverty; they are the poorest among the poor.

"Woman thy name is not frailty. You are the tower of strength, source of life and sustenance on this earth and a pretty soul which has made life worth living." Or, so says the critic of Shakespeare who declaims "woman thy name is frailty". As a matter of fact, civilisation would not have been possible but for the major contributions made by women in all walks of life. Women raise families; do household chores and cook food and eat last. Poverty hurts women the most when she has to starve so that other family members can live. The story of women's sacrifices is never ending.

Girl child is not given education which is the preserve of the male child. She has to suffer all social, religious and political prejudices only to support unjust systems. Modern times have not



changed the situation much, although in the West things for women are much better than in the East. The appalling fact of modern times is that women are counted out while planning for improving economic and social conditions of the country. The empowerment of women is possible not alone by giving them political authority but by educating them so that they can fight their own battle for equal status in society. Sanitation, which is a composite concept of keeping environment clean and people healthy, can best be ensured only if women are also educated on a new sanitation order. Only women's contributions alone can make all the difference in the sanitation status of the country which is possible by their comprehensive education and training, especially in villages where most people live.

Women worldwide are responsible for looking after homes, sanitation and personal hygiene of children and also of family. They decide how to stay clean and productive. It may be noted that 2.5 million children die by sanitation-related diseases every year; bad sanitation is also responsible for billions of cases of diarrhoea each year, countless lost days from schools and work and enormous loss of nutritional status in growing children. These deaths may be prevented if mothers are given education in personal hygiene and waste management which they can easily transfer to children and, thus, to the future generations. Improved sanitation also requires many behavioural changes that take several years to bring about. Hygiene and education also require understanding,

community beliefs, values and practices; training extension worker in the two-way communication and innovative educational methods suited to different cultures.

WOMEN'S STATUS REPORT

India has more illiterate people than any other country (320 million according to the 1991 Census) of whom 62 per cent are females.

Regional and gender disparities are conspicuous, particularly in the rural areas as reflected in the social attitude towards the girl-child. According to the *Human Development Report (1995)*, there are 1.3 billion people living in poverty in the world and 70 per cent of them are



The tribal world is full of misery and despair

female and their number has been rising over the past two decades. Although during the decade 1981-1991 female literacy rate increased at a faster rate than male literacy, the rural-urban differential increased in 1991. There are wide regional differences between the States like Kerala and Rajasthan. Although girls' enrolment has grown at the primary stage and upper primary stage, the dropout rate of girls is higher than that of boys. Educated women are more likely to use health and nutritional services, delay marriages and plan their families than illiterate ones.

As many as 450 million Indian women form roughly one-sixth of the world's female population. Using a Gender-related Development Index (GDI), the *Human Development Report (1995)* places India in the 99th position among 130 countries in relation to the status of women. An assessment of the status of Indian women based on standard socio-economic development indicators related to demography, health, nutrition, mortality and education says that the 1991 census counted 407.1 million females against

the male population of 439.23 million outstanding just less than half (48.09 per cent) of the total population of India (846.30 m.) The sex-ratio, which was 972 females per thousand in 1901, in 1981, it declined to 927. This adverse trend is attributed mainly to higher mortality rate among females in all age-groups, right from childhood through child-bearing ages. Life expectancy for females which were 23.96 years at the beginning of the century in India have risen to around 58.1 years during 1986-1990. In many industrialised countries, including Canada, Hong Kong, Japan and Norway, women have an average life expectancy of 80 years - seven years longer than that of men. (Source: *UNDP report 1995*)

There has been a sharp decline in the mortality rate among female children in the 0-4 age group from 55.1 in 1970 to 28.2 in 1992. The overall death rate of female population has also declined from 15.6 in 1970 to 9.7 in 1991, showing a slight rise to 10.2 in 1992. The death rate of the overall population in 1993 was 9.3. There had been a sharp fall in Infant Mortality Rate (IMR) in the latter half of the 1971-81 decade for both female and male children. The IMR for females has fallen from 131 in 1978 to 80 in 1992, whereas for the male counterparts it fell from 123 to 79 in the same period. A study in India found that girls were four times more likely than boys to suffer acute malnutrition but 40 times less likely to be taken to hospital. Of all deaths among



A woman dipping the grass into water to process it into rope and make a living by selling in the local market

women, 65 per cent deaths are caused by disease groups predominantly infectious in nature. Women have different priorities than men regarding basic infrastructure facilities of the community, better health and nutrition of the family, etc. Yet women have

less access than men to health services and nutrition.

The 1994 International Conference on Population and Development in Cairo and the Social Summit and the Fourth World Conference on Women in Beijing stressed the importance of working to achieve gender equality and women's empowerment. They affirmed that reproductive choice and healthcare are central human rights to which all women are entitled to. Health is the reflection of political, economic, social and cultural regime. For women's health, the two basic pre-requisites are: a multipronged attack on poverty, social injustice and cultural habits. Gender discrimination today is one of the most all-pervading forms of deprivation. Women continue to be in marginal employments and low levels of skills, their contributions being largely 'invisible'. Lack of education, information and training and low levels of literacy aggravate their deprivation. Thus, while comprising half of humanity, "contributing two-third of the world's work-hours, they earn only one-third of the total income and own less than one-tenth of the world's resources."

The fact is that women are poorer than men because more households, headed by women, fall below the income poverty-line than households headed by men. Surveys of household consumption and expenditure in many countries of North and South America, Europe and the CIS countries show the incidence of *income poverty* to be high among female-headed households. But elsewhere there is no difference between male and female-headed households. In Indonesia, Morocco, Vietnam and Zimbabwe, for example, women and men experience poverty in different ways.

In Zimbabwe gender equality was achieved in primary school enrolment by 1990. In Pakistan the gender gap in education is pronounced with 77 per cent illiteracy among women in 1995 but 51 per cent among men. Women have fewer employment opportunities than men in rural areas. In Pakistan they rarely find work outside agriculture, so their lack of access to land is particularly crippling. China has made enormous progress in gender equality; however, girls are more deprived in poor families. More than 80 per cent of the children who dropped out of school in 1990 were girls, mostly in rural and remote mountainous areas and among minority Chinese groups. There are twice as many illiterate women as men. In Mexico poverty is mainly rural, especially among large families. Many poor women start work in childhood as domestic servants, and with working days of up to 12 hours they cannot attend school. They tend to marry young

and have children while still adolescents. Women's wages fell from 80 per cent of men's in 1980 to 57 per cent in 1992. In Russia, despite high levels of education, women are concentrated in low-wage occupations, and they were the first to be let go during the transition. (Source: *US Agency for Development*)

WOMEN'S EMPOWERMENT

To be true, empowerment of women is critical for the growth of society. In a political or social dispensation where women, *who hold half the skies*, are left out of the system to live in the confines of home and kitchen, such a society cannot have any future. All the societies which grew in the past were those where women had equal participation in social affairs and were held in high respect. A World Bank report on the health of women in India, released in Delhi in June 1996, said that between 1981 and 1991 more than four million girl-children were reportedly "missing" in India and, of them, 1.2 million were never allowed to be born; it was a case of pre-natal murder. In 1901, there were 970 women for every 1,000 men; today there are 927. The worst ratio is in Haryana where it is fewer than 800. In respect of education, nutrition, and opportunities girls are discriminated against. Women walk long distances to fetch water and fuel, they raise family, look after fields, cook food and eat last. And when it comes to marriage, they are traded as cattle for a price. The fineries which they were at the time of marriage is given to them again to wear when they were forced to die with their husbands on the pyre. The status of women in India is shocking. What is more worrying is that there is no evidence to suggest that things are improving despite the empowerment plan for women.

Women's empowerment is not simply to give power to them. Bertrand Russell said: "Power remains the highest aspiration and greatest reward of mankind." Power is the ability to govern somebody else's behaviour. The instruments of power are pressure or persuasion. Pressure is simply not possible for women to exercise in the loose democratic structure that we have in India; persuasion women cannot do because they do not have intellectual skill and ability. In which case, the concept of empowerment boils down to devolution of power to women at panchayat level or to their reservation in law-making bodies. It is done only for the political purposes. For women to get power, it is necessary

to ensure their share in property in an easy and enforceable ways and give them first-class modern education which can help them get jobs and live on their own. Women are the largest refugee block in India; the houses in which they are born do not belong to them and the houses into which they are wedded also do not belong to them. With the utterance of *triple talaq*, they can be thrown out on the street. In 1986, Section 125 of the Criminal Procedure Code was amended in the case of Shah Bano Case to rob Muslim women of their right to property and alimony.

Women don't become powerful because they are elected to local or state organisations; they become powerful when they are educated and have right to property. It may be noted again that women were given right to vote in India from the day - when the Constitution came into force on January 26, 1950. But in the US, women got this right 150 years after their independence in the early part of this century. In Britain also, women franchise has a long story. But, the status of women's in the US, and Britain, so also in European countries, where also women were late in getting the right to vote, is much higher than in India. In sum, only educated women can wield power and not those without it. If one is asked to tell one reason for the shocking status of women in India, one can very safely say: *education*. Once women are given education, rest of things will follow. So, women's organisations should not be overly keen to get political powers which they cannot exercise, but they should work to promote education, health and hygiene among women. It may take one generation to do, but there is no quick fix for women's problems; there has never been.

As a matter of fact, the key to good governance is education. The catalysing effect of education on all other social development indicators is clear from the *Human Development* in South Asia, 1998 report which says: The catalysing effect of education on all other social development indicators is clear from the South Asian experience. In urban India, where mothers are uneducated, the child mortality rate is as high as 82 per 1,000 but drops to 34 per 1,000 when mothers are educated. In Bangladesh, contraceptive use among *uneducated* women was only 27 per cent as against 66 per cent for *literate* women. *Increasing the average primary schooling of the workforce by one year in India would see an increase in nation wealth by 23 per cent (GDP)*. To begin with, educationally

backward states, most of them in the north, could learn a few lessons from a high achiever like Kerala which has displayed unwavering political commitment to literacy despite having a much smaller per capita income than many other states. Drastic improvements are required in the quality of primary schools. The spectacularly unimaginative syllabus needs to be changed because this is one of the main reasons for the high rate of dropouts even before the end of the primary stage. The



Polluted water is the source of most diseases

panchayati raj system could effectively be utilised to fit people's needs into the educational system rather than impose unworkable models on them. The report has made it clear that the only problem of the poor countries is education, specially, girls education. And if it is taken care of, the rest will follow.

Augmentation of women's capabilities and a sensitive support structure provided by society may go a long way in the empowerment of women. If women are to be brought at the level equal to that of men, their economic empowerment is a precondition in the contemporary materialistic society. For empowering women economically, the following *strategies* are envisaged: (1) Women and girls should be educated with a view to preparing them to take up gainful jobs. (2) Women be imparted the right kind of vocational/professional training in tune with their aptitude and capabilities to equip them with knowledge and aptitudes and behaviour patterns required for their work participation. (3) Adequate technological support should be made available to them which is helpful in raising productivity. Many countries are moving to put these agreements into practice. India, for example, has seen an upsurge in women's participation in government at the local level. The government is encouraging full

NGO participation in policy-making; the country has set its face firmly against a family planning system driven by service quotas, and is developing a national reproductive health programme which truly reflects the rights and interests of individuals. The flow of benefits to women in the core sector of education and health will greatly contribute to mainstreaming women into national development and improving their socio-economic status. It is the empowerment strategy which is today emerging as a unique Indian response to the challenges of equality, development and peace. If women are to be empowered, it is necessary to provide an expanding networking of support services to free them from gender bias. They have to be provided with facilities like credit, training, employment and management skills and social security.

WOMEN AND SANITATION

The water conservation and management work is done best by women who are by far the most reliable custodians of their immediate environment. The participation of women in the process of formulating and implementation of developmental policies is also critical to ensure that women-specific projects are incorporated in the national projects. This is very crucial since water and sanitation are more than physical infrastructure to accommodate people. These are the essential needs in a home where women live, within which socialisation process and social interaction take place, safeguarding the social fabric and social values of the community. There are many ways to enhance women's participation in development. What is necessary is to increase women's role and status in this sector, both as beneficiaries of and contributors to development.

During the *International Water Decade*, India has increased the availability of safe, potable water supplies to such an extent that 96 per cent of its rural population has full or partial access to safe water. This dramatic expansion was made possible by the application of locally developed technologies; both the widely known MARK II handpump and the drilling rigs. And yet the challenge continues, for as many tubewells go out of the operation each year as new ones are bored. Over two billion handpumps require constant maintenance, a job which is becoming increasingly difficult for public to handle. It is common in rural villages to see non-functional handpumps in the midst of a pool of mud, with a broken platform and stagnant water, breeding mosquitoes and

flies. Only when the community accepts full ownership of this life-supporting resource, and takes the initiative to maintain and repair, will the promise of the pump - good health through safe drinking water - be realised throughout the country. Here again, the woman's role becomes critical.

In 1988, the women of Banswara in Rajasthan came together and acquired the skills and took on the responsibility of handpumps maintenance. Once women learned to maintain and fix pumps, were provided with tools and spare parts to ensure immediate repair, things changed dramatically. Not only did they assure water to those who suffer most by pump breakdowns, but it transformed the image of women in their own eyes and in the eyes of the community. No longer helpless bystanders, women such as these soon established control over a major element of their lives in many regions of Rajasthan. The Report of the Meeting of Working Group on Sanitation Promotion of the Water Supply and Sanitation Collaborative Council at Switzerland in March 1994 commented that every year 2.5 million children die from diarrhoea that could have been prevented by *good sanitation*, millions more suffer the nutritional, educational, and economic loss, through diarrhoeal disease which sanitation can prevent. Poor sanitation has led to the infestation of nearly a billion people, largely children with a variety of worm infections, with corresponding cost in health and energy.

The sanitation situation in India even today continues to be alarming largely because women are not involved in it. At present, about 102 million households in rural areas and five million in urban areas have no toilets. Hence, out of the total population of 950 million, 700 million people defecate in the open, causing environmental pollution, filth, insanitation and many health problems. In rural areas, only 14 per cent of the 113 million rural households have access to latrines, leaving nearly 97 million households to defecate in the open. Though emphasis has to be placed on building latrines, other aspects of sanitation are also important. Disposal of excreta is only one component of sanitation, handling of drinking water, disposal of waste water, garbage disposal, home sanitation, food hygiene, personal hygiene and community sanitation together form a "*clean and productive way of life*".

Hygiene education requires understanding of community beliefs, values and practices. Training extension workers specially women in two-way communication, involve innovative educational

methods suited to their culture. It also requires focusing on key behaviour and recognising the fact that small things can make big difference as in Banswara. Sulabh's efforts at hygiene education have focused on women and children, bringing about cultural change by training them in the community. It has a large number of health workers and social scientists. Sulabh has launched a vigorous programme to promote health and hygiene education and held orientation training courses for women on environmental sanitation, jointly with United States Agency for International Development, UNICEF and Urban Basic Services Programme in Delhi. "Skilfully designed training programmes for women are the most effective instrument to create an impact on health and education programmes. Sulabh's replicable training module has been prepared with a view of empowering women and bringing about a change in society through them for promoting community health and cleaner environment," says Dr. Bindeshwar Pathak.

A HUMAN RIGHTS QUESTION

Human dignity, human rights and fundamental freedom, equality, equity and social justice constitute the basic values of all societies. The pursuit, promotion and protection of these values, among others, provides the basic legitimacy of all institutions and promotes an environment in which human beings are at the centre of concern for sustainable development. They are essential to a healthy and productive life in harmony with nature. "Without progress in the situation of women, there can be no true social development. Human rights are not worthy of the name if they exclude the female, half of humanity. The strength for women's equality is part of the struggle for a better world for all human being, and



Woman or a beast of burden?

all societies," said Mr. Boutros-Boutros Ghali, former Secretary-General of the United Nations. The Fourth World Conference of Women in Beijing concentrated on some major areas of concern which included education, health, violence, human rights, the environment, the girl-child, political participation and mass media. Safe water-supply and sanitation (specially waste disposal) are vital for protecting the environment, improving health, alleviating poverty and improving quality of life. People are not aware of the health and environmental benefits of sanitation and it is not a "felt need" for most of them. Sanitation facilities are of greater importance for women and children for reasons of privacy and safety as they have to go for open defecation before sunrise or after sunset. Sanitation in India has continued to be a matter of low priority because it is not directly connected to production. It has not been considered a major investment priority in the country despite being regarded as an important indicator for improving the quality of life, which is the central goal of development.

Woman is at the centre of the Sulabh Sanitation Movement which seeks to create a new social dispensation where men and women may live together as partners in progress. Dr. Bindeshwar Pathak has worked relentlessly to abolish scavenging, restore human rights to scavengers, 70 per cent of whom are women and create a new sanitation order. The Sulabh Women and Child Development Division works to provide human dignity to scavengers, ending gender apartheid by empowering women and children through their rehabilitation and participation in development programmes and working as an advocacy group at various levels. Hence Sulabh's strategy is to ensure women's full participation in the sanitation programme. Literacy among women, with education on sanitation and personal hygiene in slums, has resulted in the improvement of the environment, ecology and health. Sulabh has trained over 3,000 women in the Delhi slums in healthcare and sanitation. These women have become agents and harbingers of social change, creating awareness about the importance of sanitation and personal hygiene. It has brought about positive impact on the health of all members of the household, especially the women and children.

The right to access to sanitation facilities and hygiene and clean environment along with proper nutrition and healthcare is the right of every woman and child. In pursuance of this right, Sulabh has constructed nearly one million household toilets all over the country and made 240 towns scavenging free. Sulabh

has constructed over 3,000 public toilet blocks all over India, now being used by about ten million every day. Toilet and bathing facilities are also provided in toilet complexes for women and children. These Sulabh toilets are operational twenty-four hours on a pay-and-use basis, making it sustainable which is necessary for any successful programme. Sulabh has been declared as the *Best Practice* in the field of sanitation at the *City Summit*, Habitat II Conference in Istanbul in June 1996. It was then given Special Consultative Status by the UN with its Economic and Social Council (ECOSOC), thereby making it party to all its debate and decisions.

Sulabh has set up healthcare units at Sulabh Shauchalayas or its toilet complexes in urban slums in co-ordination with the Government health units for specialised medical services, such as ante-natal care, post-natal care, birth control, vaccination of children, maintenance of family medical folders, etc. Various healthcare projects have been undertaken in the rural areas, such as Jhuljhuli and Teekli villages, which are being developed as model villages. The aim is to help strengthen national capacities to deliver range of primary healthcare services and to communicate essential health knowledge to families from low income communities.

Schools play a vital role in promoting healthier habits and developing personal hygiene among children. The children in the school-going age have enormous potentials to act as effective informal change agents. Sulabh's practical orientation and participatory training component of "Better School: Better Living" models focuses on training the teachers in different aspects of community health, hygiene and sanitation. A pilot school sanitation project involving 300 primary schools in six municipal corporations was undertaken by Sulabh in the rural areas of Andhra Pradesh under sponsorship from ODA-British Council in 1996. Appropriate policies for empowerment of women have to be formulated by expanding the opportunities for women to engage them in gainful work. The female work participation rate in India, according to the 1991 Census is only 22.25 per cent.

WOMEN SCAVENGERS

In India, women scavengers who have been carrying on the practice of manual scavenging, generation after generation, face humiliation only to be treated and scorned at as *untouchable* due to the abject

poverty in which they live and the caste structure which has encompassed them in its vicious circle. Even today as we approach the twenty-first century, seven lakh scavengers, 70 per cent of whom are women, have yet to be freed from this task. By training the liberated scavengers and young girls from their families in various vocations, such as tailoring, typing, computers, fashion designing, embroidery, beautician courses, audio and television repair, driving, etc., Sulabh International Social Service Organisation is providing skill development training to girls from the weaker sections, especially from Valmiki families, and thereby helping them develop their self-reliance and self-esteem and to come into the mainstream of society. The vocational training centre at Delhi was set up in 1992. Prior to this, one was run at Patna and another centre is imparting training at Jhambul near Mumbai. Children from Valmiki households are exempt of training fee. Music and dance is taught to the trainees to enhance their overall personality development. Thirty thousand wards have been trained till date.

Besides this, Sulabh is running a model English-medium school in Delhi for the sons and daughters of scavengers from weaker sections of society, giving free quality education and ensuring all-round personality development of the children from the lowest of the low strata of society. They are taught three languages: English, Hindi and Sanskrit. The strength of the school is approximately four hundred. Non-formal education is imparted to over a hundred children in the afternoons in the same premises. These children earn a livelihood and support the family by doing domestic work, rag picking, etc., thus growing up as child labourers and deprived of their childhood. The last decade of this century has seen the emergence of gender as one of the basic issues of human progress. Concern over the status of women has permeated both thinking and rhetoric. Basic problems of poverty, illiteracy, environmental degradation and violence have to be solved by men and women working together to build a better world for the present and future.

Education of girls accelerates social transformation as literacy is integrated with other issues critical to women like economic and political empowerment. The direct correlation between literacy, health, economic and political power and the exercise of informed choice, especially for women, cannot be emphasised enough. Sulabh attaches great importance to efforts which trigger changes in societal attitudes. Awareness generation programmes and

communication strategy through documentary films, TV and radio programmes, print and film media and seminars and conferences have helped in highlighting the women's concerns and need of bringing them into the mainstream of developmental processes by raising their overall status.

THREE STEPS TO WOMEN'S LIBERATION

To be true, a woman's whole life is a history of affection and forgiveness. And that will make her a bad politician. But I support their greater role in politics because that will lend grace and dignity to this ruthless game of seizing power and retaining it by fair means or foul. Woman is an index of growth and civility. If you want to know how good is a society, talk to a woman in the street and you will get the answer without having to consult economists. Woman symbolises growth, beauty, fairness and all that have made life worth living. Political power does not necessarily constitute empowerment. Women were given the right to vote in Europe and America as late as in the first quarter of this century. Invention of kitchen gadgets and universal education made them free to fight for their rights. And they rose to high eminence soon after the World War II. Suppression of women's right in India and also in most other developing countries is largely because of misplaced faith, skewed social priorities and also political compulsions. Religion has put them behind *purdah* while illiteracy has robbed them of the opportunity to grow along with men. Social beliefs have linked their loyalty to husband with the prestige and honour that forced Rani Padmawati and others to commit *jauhar* which is sung in Rajasthani folk song with great nostalgia. Very clearly, man's continence, or his loyalty to wife, has never been the issue!!

The 17-year-old bride Roop Kanwar was dragged out of her house in her bridal fineries and burnt alive on the pyre of her husband. And after nine years of litigation, all the 39 offenders were found innocent. More than 5,000 young girls are forcibly kidnapped into the Mumbai flesh market every year. When Mr. G.R. Khairnar sought to rescue some of them the other day, he was beaten up by pimps and *madams*. Politicians called Mr. Khairnar a "crazy chap", trying to end the oldest profession. As a matter of fact, there seems to be a national consensus on exploitation of women which has a long history, beginning from

Draupadi who was sought to be disrobed in the presence of most powerful, most virtuous, most feared and most respected kings and captains of the time. The story of miseries of women will never end. However, the following three steps are basic to women's redemption.

1. *Compulsory Education:* Educate a boy, you educate a man. Educate a girl and you educate a family – good, modern, science-based education. This is one and only thing that will empower women and equip her fight her battle. All girls must be given this kind of modern compulsory education, free. And, without the minimum education, marriage should not be allowed. If the state has to borrow money to educate girls; we must, to save the society. The science-based education should also include education on health and hygiene, and in basic skills.
2. *Registration of Marriage:* All marriages must be compulsorily registered. A magistrate should certify that no dowry was given or taken. This law should be enforced ruthlessly. We see every day how marriages are celebrated in big hotels and girls are killed for dowry. Registration of marriage will largely end this practice and save many lives.
3. *Property Ownership:* We have given no economic right to women, and if there are some, they are best respected in non-compliance. The house in which a girl is born does not belong to



The urban Indian woman of the 90s has carved a niche for herself with her aggressive presence and professionalism

her nor does the house into which she is married. Shah Bano was given only Rs. 219 by way of monthly allowance under Section 125 of the Criminal Procedure Code and the entire community rose up in arms and the Government of India had to change the Constitution of the country to deprive the poor old woman of Rs. 219. She died, without leaving the money even to buy coffin for her. One could never imagine that this will happen in any civilized society. But it did. The day a girl is married, her name should be entered into the official records as co-owner of the property along with her husband so that in case of divorce, she may not have to go to court to establish her right.

These three principles constitute the bedrock of women's empowerment. Once these girls grow up well educated and have full right in property and protection against the evil such as dowry, they will fight their own battle and win it. And they must win because in their victory, lies the salvation of the Indian society.

SULABH'S FUTURE STRATEGIES

1. Providing, on a sustainable basis, access to safe drinking water and proper sanitation, enabling people in the vulnerable group to meet their basic human needs;
2. Promoting and protecting the human rights of women and children, with particular attention to the rights of the girl-child, by ensuring eradication of scavenging in actual practice;
3. Enabling people living in poverty and low-income communities to have access to primary health care system facilities for eradicating, eliminating and controlling major diseases such as cholera, diarrhoea, etc;
4. Designing effective mechanisms for empowerment of women through gender development programmes and projects;
- 5.(a) Ensuring that children from the disadvantaged and downtrodden sections of society have access to a variety of formal and non-formal learning activities with equal access for girls at all levels of education, including non-traditional and vocational training; and
(b) Taking measures to address the various cultural and practical barriers that impede their access to education. ●

"For what avail the plough or sail,
or land, or life if freedom fails."

- Jefferson

Human rights – principle and practice

It was not until the dawn of the twentieth century of the Christian Era that war became the potential destroyer of the human race. The organisation of mankind into great states and empires, and the rise of nations to full collective consciousness enabled enterprises of slaughter to be planned and executed upon a scale and with the cruelty never before imagined. All the noblest virtues of individuals were gathered together to strengthen the destructive capacity of the mass. Good finances, the resources of world-wide credit and trade and the accumulation of large capital reserves made it possible to divert for considerable periods the energies of whole peoples to the task of devastation. Democratic institutions gave expression to the will-power of millions. Education not only brought the consequences of the conflict within the comprehension of everyone, but rendered each person war worthy in a high degree



Oh! Liberty - by thy name, we swear !!

for the purpose of killing others. The press afforded a means of unification and of mutual stimulation. Religion, having discreetly avoided conflict on the fundamental issues, offered its encouragement and consolation to combatants. Science unfolded its secrets to the desperate demands of men in uniform and placed in their hands agencies almost decisive in their character.

In consequence, war became more awesome than before. Instead of fortified towns being starved, all nations were methodically subjected, or sought to be subjected, to the process of reduction by famine. The entire population in one capacity or another took part in the war; all were equally the objects of attack; the air opened paths along which death and terror could be carried far behind the lines of actual armies - to women, children, the aged, the sick - who in earlier struggles would have been left untouched. Marvellous organisation of railroads, steamships and motor vehicles placed and maintained tens of millions of men continuously in action. Healing and surgery in their exquisite developments returned them again and again to the battlefield. Nothing was wasted that could contribute to the process of destruction. The last global war was a sheer madness; there was not a house in Europe, once the *Continent of Destiny*, which did not nourish its injured, or mourn its dead. And after it was over, nobody knew what was it all about.

Montagu (1976) cites evidence that some 14,500 wars were fought during the last 5,600 years of recorded history, or 2.6 wars per year. From his tally, only 10 of 185 generations have known uninterrupted peace. Burke (1975) says that there have been only 268 years of peace during the last 3,400 years of history. Peace thus comprises only 8 per cent of the entire history of recorded civilisations. A study project at the University of Michigan that war proneness is a "constant" factor in modern history. Since World War II, Valzelli (1981) notes, there have been more than 150 wars, conflicts, coups d'etat, and revolutions. During this period of "deceitful peace", he reports, an average of 12 acts of war occurring simultaneously per year, with only 26 days of actual peace. Some 25 million humans were killed during the last 35 years, more than the total number of soldiers killed during the two world wars. Out of this pain and sorrow, emerged, the concept of human rights.

Human rights are certain fundamental rights that are essential for any human being to lead a normal conflict-free life. Whatever be the theory on which human rights are based, their

ultimate aim is to grant the individual, the necessary freedoms to make his life on this earth worth living with reasonably just comfort and happiness in harmony with others in the society. The founders of the United Nations were aware as to extent the denial of human rights was responsible for the outbreak of World War II. Theirs was a firm conviction that a peaceful world could not be built without the effective guarantee of international protection for human rights. Hence the *Universal Declaration on Human Rights* was adopted by the world body. There is a direct relationship between human rights and peace. It is impossible to have true and lasting peace, when the human rights of even a section of society are unrecognised and violated. It is for this reason that since early times national and international attempts were made to recognise and protect certain valuable fundamental human rights that every individual ought to enjoy in any civilised and just society. At the state and national levels this was sought to be ensured through the laws drawn up by the governments; and at the international levels through treaties, conventions and protocols. Undoubtedly, international jurists, lawyers, judges, statesmen and philosophers have also planted the roots from which they hoped would sprout forth a new social order that would promote and protect human rights, and preserve the dignity and well-being of all human beings.



Tomorrow is today

The special feature of the struggle in modern times for the preservation of human rights is that it is now a universal movement and the violations at any place cannot be hidden from others for long. For the first time in the international sphere, the UN Charter has made the issue of human rights binding on member countries which are required to safeguard them. The Charter makes it

obligatory on the part of member states to cooperate with the UN in promoting universal respect for, and observance of, human rights and fundamental freedoms for all, without distinctions of race, sex, language or religion. The rights of the human persons are based on mankind's increasing demand for a decent civilised life in which the inherent dignity of each individual would receive respect and protection.

India in 1979 ratified the International Covenant on Civil and Political Rights that came into force in 1976. This Covenant, and the covenant on Economic Social and Cultural Rights, which constitute a detailed codification on human rights, have legal force as treaties between the parties thereto.

Article 7 of the International Covenant on Civil and Political Rights prohibits acts of torture and of cruel, inhuman or degrading treatment or punishment. Article 10, instead, provides that "All persons deprived of their liberty shall be treated with humanity and with respect for the inherent dignity of the human persons." Article 5 of the UN Declaration of Human Rights, 1948, also lays down that "*no one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment.*"

In 1975 the UN General Assembly again adopted by consensus a declaration on the Protection of All Persons from being subjected to torture and other cruel, inhuman or degrading treatment or punishment (Resolution 3452 (XXX) 9 December 1975). According to Article 1 of this Declaration, torture means "any act by which severe pain or suffering, whether physical or mental, is intentionally inflicted by or at the instigation of a public official on a person for such purposes as *obtaining from him or a third person information or confession* or punishing him for an act he has committed or is suspected of having committed or intimidating him or other persons...." (emphasis added).

Article 2 of this Declaration states that "any act of torture or other cruel, inhuman or degrading treatment or punishment is an offence to human dignity and shall be condemned as a violation of the human rights and fundamental freedoms proclaimed in the Universal Declaration of Human Rights." On June 1979 the Government of India deposited with the UN a Universal Declaration Against Torture, in which it stated that it would comply with the rules for the prohibition of torture laid down in the Declaration and implement its provisions through legislative and other effective measures. India's commitment to prohibit acts of torture and of

cruel, inhuman or degrading treatment or punishment in accordance with the guidelines laid down in international covenants and declarations are so evident, that it would seem it will readily comply with the norms prescribed by the UN General Assembly Declaration, 3452.

Everywhere on the planet, human beings make claims to a range of values that cumulatively amount to human dignity. But in too many places, human dignity is under assault. For too many of our fellow human beings, life is nasty, brutish and brief. This is despite an evolving



Lost childhood

international human rights system, which in no small measure continues to alleviate human sufferings. Years ago, it has been assumed that what a government did to its own people was its own business. That changed after 1945, following the Holocaust and Nazi denials of basic human rights. Nations decided that the promotion of human rights ought to be a principal purpose of new United Nations Organisation. Distinctive prescriptions and institutional arrangements for the invocation and the application of human rights norms were developed. These amount to a restraint on the use of a government's power. The basic proposition of the international law of human rights is that a government can no longer utilize any means against its own people even though it is acting against its own citizens and in its own territory.

In January 1947, the United Nations Human Rights Commission held its first plenary session. The Commission comprised 18 nations and its chairperson was Eleanor Roosevelt.

The task was to draft an international bill on human rights. When finally drafted a year later, the Universal Declaration of Human Rights was presented to 55 member states of the UN and was adopted unanimously. It was a historic achievement, and an important moment in the development of international human rights.

In appraising the current state of human rights it is, of course, difficult to ignore the conditions that characterise our international environment, generally. My Yale University colleague, Paul Kennedy, a historian, asserts that "the forces that challenge and test our human condition – the forces of technology, demography, political disintegration, cultural animosities, ecological damage – are severe and in many respects increasing." Indeed, these are at the root of the challenges which our human family now faces in efforts to hold human dignity.

Our Post-Cold War order is characterised by disorder and the international system by a diffusion of power, and by collapsed and disintegrating states. Our planet is less characterised by interdependence than it is by inter-determination. Our world is one of overwhelming volubility and immediacy as segments of our societies function at hyperspeed. This means that human rights abuses, thanks to the media, are conveyed about the planet. They are conveyed to elites and to the masses. Our post-Cold War international system is yielding new humanitarian crises, patterns of human rights violations on a massive scale, the denial of self-determination, environmental destruction and increasing compassion fatigue. This is a perplexing age – but as a famous American journalist once observed, "Anyone who isn't confused, doesn't understand the situation." Some of the human rights challenges of the post-Cold War age run-deep. First, there is the *challenge of respect*. This is the beginning and the end of human rights. The very first article of the Universal Declaration of Human Rights is about "respect". "All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood."

This demand for respect is so intensely held that it became the foundation of contemporary human rights standards. Respect means ensuring the fulfillment of the full range of human values. It means every human should be respected, regardless of gender, age, race, creed or the social status. Respect includes the

opportunity to determine one's place and that of one's community in the civil-political order. Article 21 of the Universal Declaration of Human Rights asserts the right of everyone to participate in his or her government and that the will of the people is the only basis for governmental authority and that this will must be expressed through periodic and genuine elections. This is, of course, a matter of respect. For even if one's spiritual journey in this life and others is preordained - one's civil - political journey is not.

Second, there is *the challenge of well-being*. The international human rights community has worked to ensure well-being - understood as the right to life and security, in combating torture and slavery, arbitrary arrests and extra judicial executions. And these challenges will still be with us. But we now must reformulate the challenge of well-being to include poverty and a basic right to food, health, cleanliness and to shelter. In a world of 5,500 million people, 1,500 million live in absolute poverty. That a child dies of starvation is as much a denial of human rights as when an adult is tortured or forced to suffer the indignity of carrying human excreta on the head. Our notion of well-being in the human rights context must include, in the words of the Irish writer James Joyce, "*out-castes from life's feast*"; scavengers are one such outcastes.

Our Post-Cold War international system is characterised by an increasing number of failed and failing states. And this is a *third challenge* for human rights. There are growing numbers of territories having the external characteristics of "states," yet they have ceased to fulfill the criteria associated with a state. How will the human rights system protect human dignity in these situations of increasing confined chaos? The human rights system have just completed an important era of standard-setting. Most agree that we are now facing the challenge of applying those standards. But what if there is sharp disagreement on the standards presumed for so many years to be universal? This is *the challenge of universality*. This challenge claims that there are regional and cultural particularities to human rights. That certain norms from what is known as the International Bill of Human Rights must be consonant with local standards. But the particularisation of human rights can lead to the termination of prescriptions designed to ensure dignity for everyone, regardless of culture, religion, age, or gender.

NEW CHALLENGES

This challenge is forcing the international community to confront and to clarify its common interests. "The banal fact of the earth's roundness," this challenge to universality is driving us all toward commonality on the basis of values enshrined in the Universal Declaration of Human Rights. More than ever before, humankind is confronted with the sphericity of the human environment. And this is the womb from which an *optimum* public order of human dignity is emerging. Authoritatively protected social processes increasingly maximize the shaping and sharing of all human values. At the level of human awareness there exists, in varying degrees, a planetary unification. Regardless of differentiation in institutional practices by which values are pursued, and irrespective of individual expectations, at least the demands for the fulfillment of human rights appear to be commonly shared. The language of human rights, if not yet universal, is universalising. It is wedded to three human commonalities - impending mortality, the power of self-reflection, and dignity. And this is a *hopeful development*.

The *final challenge* on the list has to do with the distribution of power in the international system. This is challenge at the macro level, but its repercussions are far-reaching. Our international system is increasingly polycentric. We are undergoing one of the deepest rearrangements of global power since the birth of industrial civilisation. There are territorial centres of power and there are new, non-territorial centres of power, based on technology, computation, and high finance. We must ask ourselves, in this rearrangement of power, who will be included and who will be left out? We will all increasingly face the challenge of inclusion.

The greatest innovation in the international human rights system has been participants other than states, and this is a *hopeful development*. If the behaviours of states were appraised of in the international milieu, it was inevitable that non-state actors would emerge. These were the non-governmental organisations, or NGOs. At the World Conference of Human Rights in Vienna (Austria) in 1993, governments and a plethora of NGOs reasserted a commitment to the goals embodied in the International Bill of Human Rights. But the most significant development of that world conference was the participation of thousands of new NGOs which represented human rights advocates from throughout the world, working on the front lines of the struggle for human dignity. They

are the future of human rights movement and we in the North and the West must ensure that our brothers and sisters in South and the East have the means to participate fully in the system.

The International League for Human Rights utilizes its full consultative status at the United Nations in working to prevent torture, extra judicial executions, arbitrary detention, religious intolerance, and disappearances while defending freedom of expression, of conscience, of thought, and the rights of women and children. Non-state participants (NGOs, advocates and scholars) in the international human rights system are constantly appraising and clarifying the common interests of our ever-changing community. While necessarily drawing upon history, they have forced us all to look to new constitutive and institutional arrangement to apply those standards to which we are all committed. The result of this appraising and promoting is the recently created United Nations High Commissioner for Human Rights. This is a *hopeful development* for human dignity in our post-Cold War international system. Perhaps the most hopeful trend is the growing number of human rights monitors. *The International League for Human Rights* provides technical assistance in the field to those monitoring and reporting human rights abuses. This takes a special kind of courage. The late Robert F. Kennedy observed at Capetown, South Africa, in 1963: "It is from numberless acts of courage and belief that human history is shaped. Each time a man stands up for an ideal, or acts to improve the lot of others, or strikes out against injustice, he sends out a tiny ripple of hope, and crossing each other from a million different centres of energy and daring, those ripples build a current which can sweep down the mightiest walls of oppression and resistance."

That human rights monitors and advocates have the courage to continue their work at great personal risk, is most hopeful for all of us. But with our human rights standards, advocates, challenges and a few hopeful trends, where does this leave human rights and our species stand at the end of this century? We are left with a specification of human dignity that is partial at best, unfulfilled at most, partially shared at least, and better than any alternative at worse. The writer Thomas Mann observed that "...man lives not only his personal life as an individual, but also consciously or unconsciously, the life of his epoch and his contemporaries." We have to clarify our goals, examine those trends relentlessly driving us to the future. We must ask ourselves if we like that

future. If not, we must consider alternatives and identify those factors that will get us to a preferred future.

We are entering a phase of the psycho-social evolution of our species in which human rights must be viewed as being at stake in every interaction and decision. That must be made clear. It must be made clear to national elites by everyone of us concerned for human dignity. Not long ago, the Secretary-General of the United Nations issued an *Agenda for Peace*. It underscored the importance of peacekeeping to the international community, along with a plan for peacekeeping operations in the future. What we need now is an *Agenda for Dignity*. We need a plan born of the claims and demands of everyone of us in our mutual common interests that will address the human rights challenges. ●

No one shall be subjected to torture or to cruel, inhuman or degrading treatment or discrimination. - Universal Declaration of Human Rights, Dec. 10, 1948

Sulabh promotes human rights

- scavengers who ?

S scavenging is a human rights question because it violates Article (1) (All humans are born free and equal in human dignity and human rights), Article 4 (No one will be held in slavery or servitude), Article 5 (No one shall be subjected to cruel, inhuman or degrading treatment or punishment) and Article 23 which says: "Everyone, without discrimination, has the right to equal pay and equal work." Scavenging also violates the Preamble of the Universal Declaration of Human Rights (signed on December 10, 1948) which among other things, says "The Charter affirms faith in the dignity and worth of human person and in the equal rights of men and women".



**HUMAN EXCRETA AS HEADLOAD:
Oh Lord, see how your children
suffer - The Bible**

The abuse of human rights as pointed out by various human rights commissions at national and international levels largely concerns arbitrary arrest, child and bonded labour and war victims. But, reading between the lines of the

Declaration will reveal that those who have been discriminated against, in social relations, economic opportunity or legal dispensation also deserve protection under the Declaration. Scavengers, who are made untouchables in their own country, need protection under the Charter no less than the victims of apartheid in South Africa, ethnic conflicts in the Balkans or the victims of prejudices anywhere else in the world. Scavengers, however, do not get media attention because they have been suffering the indignity of physically cleaning and carrying human excreta for centuries without protest and with total resignation. They are victims of history!!

One of the features of the Indian caste system is that each caste has been associated with a particular occupation. The so-called superior castes enjoy a wide range of choices which the lower castes don't. The lower castes do unclean jobs, The two main tasks are sweeping and leather processing. Sweeping streets, cleaning drains and sewers, removal of human and animal waste, raising pigs etc. are their jobs. Since latrines in most cities don't have flush, the sweeper or scavenger (*Balmikis*) have to carry buckets of human faeces on the head. Leather work includes handling of dead animals, removing their skin and curing it, and making leather goods. By assigning these tasks to these people, society has saved other people from doing dirty work. The jobs that Dalits do (oppressed) are not only undesirable, polluting and hard, but are also low-paid; they eat kitchen left-overs and do menial work. Sweepers and scavengers collect everyday one or two *chapatis* from each house. This practice is gradually disappearing from big cities but is still prevalent in small towns.

SCAVENGING CASTES

Sweepers and scavengers in India are known by many names, the most common among them are *Mehtar* which, ironically, means prince or leader. The head of the ruling family of Chitral State (now in Pakistan) is called *Mehtar of Chitral*. Another name for this caste is *Bhangi* a derogatory term. The term *Bhangi* is derived from the Sanskrit word *bhangi*, meaning hemp; it seems to be an allusion to their drinking habits. *Bhangi* also means "broken". This describes the scavengers who split bamboos and make mats and baskets. In Punjab, scavengers are known as *Churas* and *Jharna*, who sweep scraps. Another name in Punjab and Uttar

Pradesh is *Balmiki* or *Lal Begi*. These are the names of two great saints, the first being a Hindu and the other a Muslim. The other names are *Hela*, *Hari*, *Hadi*, *Bhumali*. They are also called *Halalkhor*. Some other castes also do scavenging such as *doms*, *dumras*, *dhanuks*, *bansphor*, *mazhabi*, *mukhiar*, *thoti*, *chachati*, *pakay*, *relli*, *ghasi*, *olgan*, *zadmalli*, *jamphoda* and *metariya* etc. But whatever their names, all of them are at the bottom of social ladder and are regarded as very unclean, both by the Hindus and Muslims. *Col Tod* calls them the "*refuse of mankind*." Scavengers are a functional community coming from different racial and social groups. Most of them took up this degrading profession because of poverty. The variations in their physical features show that the members of various castes have joined this profession at different points of time, due to economic compulsions, defeat in battle or just by birth. *Stephen Fuchs* ("*At the Bottom of Indian Society*") has pointed out that "the endogamous sub-sections of this lowest of all low castes, are not without a certain social gradation. Within the scavenging castes, some sections are superior to others, whose social status is determined according to the origin of the section or according to the type of work. The lowest place is occupied by those who carry night-soil".

MANUAL SCAVENGING

Cleaning latrines is the main work given to scavengers. This is the place where scavengers come in direct contact with human excreta and his (or her) hands are completely soiled. In the congested locality, the scavenger has to crawl through a narrow passage, pushing the basket with one hand, resting his body weight on the other to make way up to the latrine chamber through a narrow opening. And, in the latrine where the seat is deep inside, he has to stretch his hand to the maximum and thrust his head into the hole to clean the toilet. The scavenger has to bend forward into the narrow space to clean excreta from the toilet with antechambers. The latrines which have no receptacles, human excreta drops directly on the floor which, with the passage of time, wears out and the brickwork becomes patchy and uneven. In most cases, the side-walls are also without cement plaster; with the result, human excreta gets stuck up everywhere on the side-walls and also on the floor. The scavenger, while cleaning, has to scratch the floor and the side-walls to do maximum cleaning. It is also a common sight to see scavengers (mostly women) moving



Human excreta is being carted away to disposal sites after it was physically cleaned and carried from household toilets by scavengers

with excreta on the head, stored in bamboo-baskets or in leaking drums with the excreta trickling over her face and body. The passers-by avoid such persons. If a scavenger comes close to them, he or she is abused. In many places, latrines are so constructed that the users do not even see their own excreta. They simply squat over the seat and go away without even caring to know who cleans their toilets. And the scavenger continues to do physical cleaning, being abused, get underpaid, and live a life of degradation unheard of in human history. No human degradation could be more cruel and inhuman than the one suffered by scavengers.

RAPID SURVEY

J.H. Hutton in the 1931 Census estimated the population of various scavenging castes to be at 20 lakh in the undivided India. In the 1961 Census, population was 8.2 lakh, of which 48.20 per cent belonged to the Scheduled Castes. In other words, 51.80 per cent of those engaged in sweeping and scavenging belonged to other than Scheduled Castes. There are many among scavengers who have adopted Christianity. Under the provisions of the Constitution,

they have ceased to be Scheduled Castes, but they do scavenging. There are a large number of Muslim scavengers in Punjab, Haryana, Delhi, J&K, and Uttar Pradesh. In some areas, it has been found that the people belonging to tribal communities (for example, Kabui Nagas in Shillong) have taken to scavenging. No dependable estimate has been made of Christian and Muslim scavengers. The Task Force, constituted by the Planning Commission in July 1989, (in its report submitted on March 21, 1991), had estimated the number of scavengers for the year 1989 at 4,00,999, out of which 3,33,779 were in the urban areas and 67,220 in rural areas. In the urban areas, 2,06,612 were estimated to be male and 1,27,167 female. This shows that about 83 per cent scavengers are in the urban areas and 17 per cent in rural areas. It also shows that 35 per cent are women. Tasking into account the number of non-Scheduled Caste scavengers and also the growth in the number of scavengers since 1989, the number of scavengers may be roughly eight lakh. A rapid survey to identify each individual scavenger and his dependants was undertaken by the Union Ministry of Welfare through District Magistrates of the country. The survey had identified 7,36,114 persons. The survey, however, suffered from deficiencies and there had been complaints that many scavenging families had been left out. But one thing is clear that the number of scavengers may be about eight lakh as mentioned above.

The Task Force, constituted by the Planning Commission (as mentioned above), also estimated that the total number of dry latrines was 76.4 lakh, of which 54 lakh were in the urban areas and 22.4 lakh in the rural areas. At the time of 1991 Census, it was found that the percentage of households, having toilet facility, was only 23.70 per cent. In other words, more than 76 per cent of the people (or about three-fourth of the total population in the country, had no toilet facility. In the urban areas, the percentage of households having toilet facility was 63.85 per cent as compared to 58.15 per cent in the 1981 census. More than one-third of the urban households in most States and Union Territories did not have toilet facilities while more than half of the urban households in 177 districts did not have toilets. The percentage of households having toilet facilities in the rural areas at the time of 1991 census was only 9.48 per cent. It is evident from the above that the problem of sanitation has been tackled to some extent in the urban areas but it is still grave in rural areas. (*see chapter 'Magnitude of the problems' for details*).

Out of 950 million population, more than 750 million people either defecate in the open or use insanitary bucket/dry privies cleaned manually. It is estimated that 20% of the urban population have access to water flush arrangements connected to sewer system, 14% have access to water flush arrangements connected to septic tank, 33% do not have latrines in their houses. In rural areas the situation is worse only 3% of the rural population has access to sanitary toilets.

LEGISLATION ON ABOLISHING SCAVENGING

Parliament passed the *Employment of Manual Scavengers and Construction of Dry-latrines (Prohibition) Bill, 1993* to abolish scavenging and ban the construction of dry latrines. This was, no doubt, a historic decision but no time limit had been given, by which the system of manual scavenging would be totally abolished and, thus, the very purpose of the bill was defeated. The States of Andhra Pradesh, Goa, Karnataka, Maharashtra, Tripura and West Bengal have adopted this Act by passing a resolution in their respective Assemblies. The Government of India has constituted a seven-member (including Chairperson and Vice-Chairperson) National Commission for *Safai Karamcharis* under the National Commission for Safai Karamcharis Act, 1993 in August 1994. The tenure of the Commission is three years. The main function of the Commission is to recommend to the Central Government specific programmes of action towards elimination of inequalities in status, facilities and opportunities for Safai Karamcharis under a time-bound action plan; study and evaluate the implementation of the programmes and schemes relating to the social and economic rehabilitation of Safai Karamcharis.

PEOPLE'S COMMISSION ON ABOLITION OF SCAVENGING

In spite of many commissions and committees including the National Commission for Safai Karamcharis set up in 1997, the degrading practice of manual scavenging still continues. Hence, Sulabh has set up the *People's Commission on Abolishing Scavenging* which will take a holistic view of the problem and suggest ways to abolish it. The terms of reference of the proposed Commission will be: to ascertain the nature and extent of the problem of manual scavenging in its historical and contemporary

perspectives; to determine the extent to which manual scavenging has been reduced in the country; to develop a socio-economic profile of scavengers in rural and urban areas; to examine the working and living conditions of scavengers; to find out the participation of scavengers in education and other development programmes; to study and evaluate the effectiveness of various schemes on the abolition of manual scavenging; and to make recommendations for the liberation, resettlement and upgradation of scavengers with a view to finally abolish this practice totally.

Scavengers have no forum no union nor any caste leader to plead for their salvation. These are the defenceless people, almost perpetually waiting for a redeemer who doesn't seem to be coming, now that Gandhiji is dead and his dream of *Bhangi Mukti* (salvation of scavengers) lies broken in heaps. Scavengers need not be introduced; we know them but refuse to mention their names. We quietly dismiss them at the backdoors after flinging at them the day's leftovers of the kitchen. In small towns, these mysterious figures materialise in dark shadows early in the morning, stealthily running between lanes and by-lanes, cleaning dry-latrines and collecting human excreta on the head to the tankers which cart it away to disposal spots.

Scavengers, as professionals, have been growing in number; first, because of the general growth in population; and, second, because of the rising demand for their services in fast-growing urban and semi-urban settlements, most of which are unplanned and, hence, unsewered. This situation has also produced ready jobs for them which are hard to come for other untouchables, equally poor, illiterate and outcast. Socially, scavengers are untouchables among untouchables. They are completely sealed off from the mainstream of social life. The law (Articles 17 and 42 of the Constitution and the Protection of Civil Rights Act, 1955) does not help in this respect at all. The sporadic attempts of private persons or social organisations have not changed the situation either. The question of social acceptability is not a matter of law; it is an attitudinal problem which has to be solved differently.

Scavenging started in India during *Puran* period when people were divided into 15 castes and one of the castes called Chandal was allotted the work of cleaning and carrying human excreta. The number of dry-latrines increased during the Mughal period when women in *Purdah* were provided with this indoor facility. Later, it spread to other communities as well because of increasing

insecurity to women. Warriors who were made captives in wars, were also forced to clean latrines and, later, there emerged a class of scavengers who belonged to different castes and social background only to unite in the work of scavenging which became an institution and is a running sore on India's social structure. Ironically persons from all the religions, viz. Hindu, Sikh, Muslim and Christian are scavengers today. (see chapter 'History of Evaluation of Toilets' for details)

Once a scavenger, always a scavenger. The people, who were pushed into this profession by compulsions of war or joblessness, never came out of it. They became untouchables forever. Their number grew steadily as marginal people without jobs joined ranks. Thus, once the defenders of our land and religion became scavengers of today. Surnames like Chauhan, Bisen, Bhadwaria, Thakur, Rout and Bundela are clan names of scavengers and as well as of Rajput warriors who fought and fell for the country and its glory. Gandhiji had made it mandatory for the inmates of his *ashram* to clean these places. (Mrs. Indira Gandhi had done that.) All the Prime Ministers had tried to help scavengers. Mr. Rajiv Gandhi revised the 20-point programme to include plans to end scavenging. Recently, the Planning Commission had set up a "Task Force" on scavengers and their rehabilitation. As Mrs. Indira Gandhi said in 1983, scavenging could not be abolished without providing an alternative to it. Now, we have Sulabh technology which works independent of the sewerage system and is hundred per cent pollution-free. UNICEF, UNDP and the World Bank, as also the Government of India have recognised this technology which is working well in India as well as outside the country. The Sulabh system does not need scavenging, is fail-safe, appropriate to Indian conditions, and affordable to all.

ABOLISH IT, HERE AND NOW

Hence, the first step towards solving this problem is the total ban on scavenging and setting a final deadline (many had been set before) when this practice will be declared unlawful. All civic bodies should warn scavengers that they should equip themselves for other vocations by that deadline and for doing so civic bodies and voluntary agencies should play a leading role. The second most important step should be the conversion of dry-latrines into leach-pit, waterseal and flush latrine mandatory and house-to-

house search should be conducted to ensure that none dry latrine exists there. Mr. Narasimha Rao, former Prime Minister, had set 1997 end as the deadline to abolish scavenging. But, this does not seem to have been possible.

Once dry privies are converted, scavengers will have to give up scavenging. They can be absorbed in other sanitation work. Having done this, extensive programme for their education and rehabilitation should be launched with full publicity in the manner of a movement in all cities and towns of the country. Adequate money should be spent on programmes for scavengers who should be persuaded and pressured to change over to other professions. Some attempts have been made by the Central and State Governments and voluntary organisations for the liberation of scavengers.

However, these efforts are inadequate and sporadic. The diffused thrust with inadequate support of appropriate alternative technology and funds have succeeded only in very small measure. The problem of liberating scavengers is too big to be solved just like that. It is the time to organise our national efforts and energy in order to abolish scavenging once and for all. The nation must pool all its resources and borrow, if necessary, from international leading agencies to obliterate this stigma from Indian society which hurts our claim to civility and culture. And, in so doing, at least for once we will be borrowing money on interest to restore human rights and solve a great social problem of human slavery which caused in the past many wars in the world, including one in the US which President Lincoln had to fight in 1862 and fall eventually to an assassin's bullets. Gandhiji had said: "If I were to be born again, I would like to be born in the family of scavengers so that I may relieve them of the inhuman, unhealthy and hateful practice of carrying nightsoil." According to Hindu belief, a pious soul gets the birth of his or her choice. In which event, Gandhiji should have been a 49 year-old scavenger carrying human excreta on the head. So, let's search for our lost Gandhi among scavengers where he must be waiting to be liberated by his people. We have made him wait for too long. In bending all its efforts to help scavengers, Sulabh prevents human rights abuse and promotes a new social order, fair and just. ●

"Noises are lost in the air but silence endures."

The disabled also have human rights to fight for

Victory produces many admirers but defeat has to be suffered alone. Those who have the divine blessings to be born fit and fine will not easily understand what it is for the disabled to live a life in a constant fear of being thrown out of the social system. Law alone cannot help; it never does. To restore a good and purposeful life to the disabled, specially the disabled women, a caring society and family is necessary -- a society which can spread out its institutional network to educate and train these people and help them live well. The disabled also have human rights which grant them a permanent lien on society. Sulabh works to promote these rights.



Stephen Hawking is physically confined to wheel-chair but his mind probes the cosmos

There is enough evidence to suggest mental ability is not impaired even when limbs don't really work. Milton wrote finest poetry after he became blind; the famous Russian writer Gogol had emaciated hands but he produced some of the finest novels to be compared with Pushkin; Franklin D. Roosevelt, a crippled man, was the longest serving President (1933-45) of America who led World War-II and Stephen Hawking, also on the wheelchair, is the most brilliant mind since Einstein and the world's greatest living physicist who has plenty of things to say from Big Bang to Black Holes. Hawking can neither

walk nor speak except through machine. Ludwig van Beethoven reigned the entire Europe with his music which he himself could not hear. He was deaf. The wandering Greek minstrel, Homer,



The wandering Greek minstrel, *Homer*, who described the epic battle of Troy in *Illiad*, could not see. He was blind

who wrote and sang the story of Troy (*Illiad*) was blind. The list is not complete.

According to WHO, ten per cent of the world's population, suffer from the disabilities of one kind or other and they are not able to live full life. Disability itself is a curse, but it is worse when women are made disabled. They are subjected to dual discriminations: firstly, because of gender and secondly because of disabilities. The fact assumes specific significance in the Indian context where the Hindu doctrine of '*Karma Phala*' has traditionally shaped attitude towards the disabled. Women's disability affects their entire life – education, employment,

economic status, marriage and family, health-care and rehabilitation.

The Society for Disabled Women (SDW), promoted by Sulabh, has made significant contributions in helping the women with disabilities. The Society encourages and supports the disabled, specially disabled women, in their struggle for integration into the mainstream of society. The Society also works to abolish elimination of gender discrimination. The *Centre for Children with Special Needs* is a model centre of learning for disabled beginners, particularly for deaf-dumb and mentally retarded children. What initially started as a preparatory course in July 1994 (in the sprawling Sulabh premises at Mahavir Enclave, Palam-Dabri Road, New Delhi) with the enrolment of only eight students (five deaf-dumb and three mentally retarded children), has now become a centre for free and quality education. No wonder, the number of students seeking admission has been increasing by the day.

The curriculum of the Centre has been structured in such a way



The German composer, *Beethoven*, regaled one generation of Europeans through his music which he could not hear. He was deaf

as to make children employable, instead of being a burden on their families and society. Following the CBSE curriculum modelled on the *Lady Noyce School* (Delhi Gate), the Centre is expanding its educational network fast. Besides organising teachings on – Hindi and Mathematics, it also offers vocational training courses in order to equip students with skills, including making greeting cards for different occasions, candle and diya-making, weaving and cooking. The deaf and dumb have hearing aids and other devices of learning.

The children of the Centre have also participated in many academic competitions and cultural functions, including the YMCA-sponsored Special Olympics in 1995, World Disabled Days and Special Olympics of Dance and Music competition organised by the SDW, at states and national levels. And, many of them have bagged prizes.

National seminars on disability and rehabilitation are also organised by the Society to mobilise public support for disabled women. Many organisations and distinguished persons have come forward to extend a helping hand in this noble cause. SDW does research work on disability studies as a separate academic discipline. Sulabh



The handicapped children of the Society, in their colourful best, staging a cultural programme, defying disabilities in the making of which they had no hand

does all these only to give a new deal to the disabled, specially disabled women; telling them that all is not lost for them. They can be useful members of society like Beethoven, Hawking and others. Sulabh is with them. ●

The present is rooted in
the past - Lord Gibbon

Of those who worked to improve sanitation since ancient time

Sanitation has a long history, beginning from the Indus Valley Civilisation, Vedic and post-Vedic periods, so also of Greek Nobles, *Bactrians*, Sunga, Kushan, Gupta dynasties, the Maurya, Mughal and the British times till today. The sanitation practices in Vedic and post-Vedic periods, were quite safe and hygienic. People used to go out for defecation because of religious sanctions. They would dig a pit and put grass and leaves and defecate into it; again after defecation, put grass and leaves and fill it with earth. The system was safe and hygienic as far as it worked. People would take water with them to clean themselves after urination. After coming from defecation, they would take bath. Nobody will take food without cleaning feet nor would enter kitchen. This practice was cumbersome but safe and hygienic. During the Indus Valley Civilisation, (Mohanjo-daro and Harrapa), solid and vegetable wastes and also wastes from kitchen were disposed of properly so that these may not create environmental pollution. After five or six months, wastes were used as manure to grow crops.

The encounter of a Buddha's disciple with a *Chandal* (scavenger), entrusted with the task of carrying night-soil in a *Bahangi*, (two-pots suspended on a stick mounted on the shoulder of the man who carries it) shocked the Buddha. In fact, he is said to have recommended the use of pits with raised platform of bricks and wood for defecation. Thus, prevention of environmental pollution through better management of human waste seems to have concerned the greatest social reformer of ancient time, Lord Buddha. During the Maurya period, the sanitary condition, particularly in urban areas, received greater attention. Chanakya, the 'Mantri', (or the Principal Adviser to the Emperor), laid emphasis on the need for a kitchen and a bathroom in every house. Punitive measures were also prescribed for those defecating in an open space of the town. In *Aarth Shastra*, he said, if somebody defecated in the open, he would be fined 100 *quin* of that time, 10 *quin* was

to be fined for urinating. Sick and disabled were, however, exempted. There seemed to be an elaborate system for managing civic amenities during this period. Specific designs for toilets and bath, however, do not find any reference in the social history of this period. It is our guess that these resembled the bucket privies prevalent in the contemporary India.

During the *Daivic Puran* period also, the practice of digging a pit before defecation continued. In Puranic period, this sub-human evil system of scavenging also existed. In the Puranic period, the reference to '*Chandal*' (a caste for the disposal of human waste and the bodies of dead animals) confirms the gradual institutionalization of a system of disposal of human waste. There seemed to have emerged a section of people who preferred to defecate inside the house. In spite of all these, a scientific system for disposal of human waste remained a distant dream.

The number of scavengers increased enormously during Muslim period. The Muslims defeated the Kshatriyas, and some of them were made captives. Muslim brought women with them who were kept under *Purdah* and, therefore, they used to defecate inside the house and the persons who were made captives were



Gandhiji set up Harijan Sevak Sangh which was a pioneering agency working to abolish untouchability

forced to clean their excreta manually. Since then, scavenging became a profession and persons who cleaned human excreta were called as *bhangi*, *halalkhor*, *mehtar*, etc. There are 29 sub-caste names which are common between the Kshatriyas and scavengers. Physical features and living style of the scavengers are different from other Scheduled Castes because of their origin. During Mughal and British period, scavengers adopted the religions of their masters. Hence, we find people from all the religions – Hindu, Muslim, Christian and Sikh – as scavengers. The sanitation before Independence was so bad that those who were engaged in sanitation work were given less wages, kept at the outskirts of the villages and towns; nobody would touch them; housing condition was still worse. They used to be called *untouchables*. Today there are more than 113 million houses which have no toilets and about eight million houses have bucket toilets cleaned by about 400,000 scavengers manually. No wonder about half a million children die every year due to dehydration, diarrhoea. Villages stink because of open defecation. Women are the worst sufferers; they have to go for open defecation before sunrise or after sunset, as a result of which they get headache and many other diseases. It is not safe either for them to go for open defecation after sunset.

Mahatma Gandhi said that unless one had a toilet in his house, he must put earth on excreta after defecation (*tatti par mitti*) to prevent diseases and foul smell. While Gandhi was in Phoenix Ashram, South Africa, he used trench latrine and human excreta was used as manure. During the freedom movement, he recommended the use of trench latrine. Some of his followers engaged themselves in sanitation work. Prominent among them were Appa Saheb Patwardhan, Anna Saheb Datane, Atre Guruje, Dr. B.R. Ambedkar, Jiwan Lal, Jai Ram Das, Kesho Das Sah, Yugal Ram Vaidvave, Mama Saheb Phadke, Thakkar Bapa, Bithal Pharanee, Sant Vinoba Bhave, Ballabh Swami, S.N. Murthi, R.R. Diwakar, Rameshwari Nehru, Bhau Narvekar, Yiyogi Hari, Jaglal Choudhary, Sarayu Prasad and Rajendra Lal Das. Among all, Appa Saheb Patwardhan kept himself engaged in sanitation work till the end of his life. He managed to devise a compost type of latrine known as *Gopuri*.

Under the Government of India Act of 1935, health administration became the responsibility of district health officers, but the job was left to sanitary inspectors and that was the beginning of the fall in the standard of sanitation system. During

this period, some sporadic attempts were made at latrine construction as part of the rural medical relief programmes in Uttar Pradesh, Punjab, Bombay, Mysore and Madras. The Gopuri and Nasik types of latrine became popular in former Bombay Presidency, Hagevu type in Mysore, the borehole *Dehati Tatthi* and in some parts of Northern India. The septic tank latrine was recommended as a suitable type by the Ushagram Centre in West Bengal; this was also used by people in some parts of the country. The Wardha type latrine, consisting of a shallow trench and use of a shovel to cover the excreta, was favoured by Gandhiji.

Between 1940 and 1945, attention was paid to the improvement of the borehole latrine in West Bengal through the Rural Health Centre attached to the All-India Institute of Hygiene and Public Health, Calcutta. The provision of a waterseal and a suitable mould for casting squatting plates was developed at the Singur Health Centre. Later, the borehole latrine was modified into the dugwell latrine with waterseal and squatting plates. These were constructed in the Singur area where boreholes had been constructed earlier. A systematic study was also made during this period on subsoil pollution from borehole and dugwell latrines by *Dyer and Bhaskaran* under a Rockefeller Foundation grant. The present (1998) Director of the All India Institute of Hygiene and Public Health, Prof. K.J. Nath, has contributed a great deal to the development and improvement of the sanitation systems. Dr. (Prof.) Indira Chakravarti, formerly with the All India Institute, also made significant contributions in sanitation research.

In 1946, the Environment Hygiene Committee noted that the following types of latrines could be considered to be set up in rural areas, (i) septic tank latrine, (ii) the borehole latrine, (iii) pit latrine, (iv) hagevu type, and (v) dugwell latrine with waterseal. Thus, at the time of Independence, some types of latrines were available for use in rural India but they were not well tested. Before 1949 and 1998, various State and the Central Governments constituted Committees to improve the living conditions of the scavengers. Notable among them are Barbe Committee in Maharashtra, Slappa Committee in Karnataka, Malkani Committee, Bhanu Das Pandya Committee and presently Safai Karamchari Commission.

Research by a number of agencies on rural latrines was conducted under the five-year plans with a view of developing suitable designs. A multiple approach, incorporating organisational,

educational and engineering aspects of the problem, was initiated by the Planning, Research and Action Institute (PRAI), Lucknow. The Research-cum-Action (RCA) project was launched in 1956 by the Union Ministry of Health with the assistance of the Ford Foundation. A great deal of useful research on latrines was done through this project at its three centres, Poonamallee (Madras), Singur (West Bengal) and Najafgarh (DELHI). PRAI developed a circular pit system of toilet while the Poonamallee Institute developed rectangular one. Realising the importance of a scientific study on rural latrines in the implementation of the National Water Supply and Sanitation Programme under the five-year plans, the Indian Council of Medical Research (ICMR) encouraged research units in Kerala, West Bengal, Bombay and Punjab. And good progress was made by the research units in Kerala and West Bengal. Some useful work was also done during this period in Barapalli, Orissa, and by the Kerala Government and the World Health Organisation (WHO) projects. Gujarat and some other states also undertook latrine construction work as part of their hookworm control programme.

In recent years, the organisations such as the Friends Service, Ludhiana, World Health Organisation project at Ramnagaram, Mysore; Sanitation Wing at Gandhigram, Madras, Central Public Health Engineering Research Institute, Nagpur, and the National Building Organisation have also done good work on developing latrine designs and implementing the sanitation programmes in the areas of their operation. Studies on the manurial value of the pit contents have been carried out by the All India Institute of Hygiene and Public Health, Calcutta; Poonamallee Health Centre and the Central Public Health Engineering Research Institute, Nagpur.

In the beginning of the sixties, the Khadi Village Industries Commission, Gandhi Smarak Nidhi, Safai Vidyalaya, Harijan Sevak Sangh, Bakshi-ka-Talab in Uttar Pradesh. Poonamallee Institute of Tamil Nadu started propagating the idea of pourflush toilet. The programme acquired momentum in 1968 when the National Committee was formed to celebrate the birth centenary of Mahatma Gandhi at the national level and state levels. During Gandhi Centenary period, the Government of India directed all the Centenary Committees in the States to include the programme for liberation and rehabilitation of scavengers which was a major concern for Mahatma Gandhi. The Safai Vidyalaya, its office-bearer Appa Saheb Patwardhan and Ishwarbhai Patel, promoted this in

Gujarat. Mrs. Savitri Madan of Gandhi Smarak Nidhi, Maharashtra, did good work in Nasik and Pune areas. Dr. Bindeshwar Pathak joined the Bihar Gandhi Centenary Celebration Committee 1968 where he was asked to find out ways to end scavenging. And, that was the turning point in the sanitation movement in India.

In 1977 the attention of Mr. A.K. Roy who was the sanitation engineer with WHO, was drawn to this problem and, with his efforts, a national seminar was organised by WHO, UNICEF and Government of India in 1978 in which representatives from international agencies, Government of India and all the state governments participated. In 1979, Mr. A.K. Roy (now with Sulabh) joined the UNDP/World Bank Project on low-cost sanitation. The project carried out evaluation of low-cost sanitation work in the country. In 1985, it published a manual on pourflush latrine. The Union Ministry of Home Affairs, took up work on scavenging in 1981. Later, this responsibility was transferred to the Ministry of Welfare which was split into two ministries, Ministry of Welfare and the Urban Affairs and Employment.

HUDCO, a Govt. of India undertaking, also played an important role in promoting low-cost sanitation programme by providing funds for projects. The role of Planning Commission and Ministry of Health has also been critical. The Ministry of Rural Areas and Employment and CAPART, had taken up a big rural sanitation programme in the country. International agencies, including WHO, UNDP, World Bank, UNICEF, SIDA, DANIDA, IRC, HABITAT, Lutheran World Service are worth mentioning in this connection. The Ram Krishna Mission, Rotary Club, CBRI, Roorkee also have played important role in sanitation movement in India. The National Environmental Engineering Research Institute, Nagpur not only did research on the subject but implemented the low-cost sanitation programme in Nagpur area. Rural University, Gandhi Gram, did some important work in Tamil Nadu.

This was the backdrop against which the Sulabh movement was launched by Dr. Bindeshwar Pathak in 1970 after which a dramatic change came in the sanitation status of the country.

HARIJAN SEVAK SANGH

The Harijan Sevak Sangh was set up in 1932 after Mahatma Gandhi's epic fast in Yarovada prison against the decision of the British Government to separate the so-called untouchables. He broke his fast on September 26, 1932 after the British Government's

revision of the *Communal Award* and the provision for separate electorate for untouchables was deleted. The crisis was resolved but it made Gandhiji realise that effective steps should be taken to abolish untouchability if only to save Hindu society from disintegration. On September 30, the same year, it was resolved in Bombay under the presidentship of Pandit Madan Mohan Malaviya that untouchability should be eradicated in all its forms from Hindu society. To implement this resolution, a new organisation named "Anti-untouchability League" was formed in October 1932 which was later on called the "*Harijan Sevak Sangh*". The entire nation stood in support of this move, morally and politically. Deshbandhu Thakkar Bapa tried to turn it into a national movement and within a few days of its setting up, he spread it throughout the country with utmost zeal and devotion. Gandhiji made a countrywide tour at the request of Thakkar Bapa, covering 12,500 miles, between November 1933 and July 1934. This had a great impact on the masses. Millions of people heard the speeches of Gandhiji, thousands of them, inspired by his thought, stopped the practice of treating Harijans as untouchables and started fraternizing with them.

The Sangh had from the beginning sought the co-operation of the municipalities and other local bodies in ameliorating the working and living conditions of sweepers and scavengers. The response had been slow but a beginning had been made by drawing the attention of these bodies to the lot of the sweepers and scavengers. Thirty-five co-operative societies functioned under the Sangh during the third year of its existence (1935) to provide credit to them and save them from the clutches of money-lenders. In Bombay, 226 rooms had been hired by the Sangh and let out to the sweepers and scavengers at cheap rates. As a result of the Sangh's intervention the Ujjain and Bhilsa Municipalities in the Gwalior State began to give loans to sweepers at a low rate of interest. In UP, Faizabad Municipality advanced Rs. 500 to the Sweeper's Co-operative Society and agreed to recover the amount in monthly instalments from their salaries. In Meerut (UP) and Bellary (now in Karnataka), the Sangh was able to secure the benefit of maternity leave for women sweepers.

After the introduction of provincial autonomy in 1936, the Sangh made representations to Congress Ministries for bringing about improvements in the working and living conditions of sweepers employed by local bodies so that they might get a decent

minimum wage, proper housing, education and other facilities and might be saved from the corrupt officials and money-lenders.

The Municipalities in Bombay, Ahmedabad, Madurai, Tiruchirapalli, Bangalore, Madras and Kanpur constructed residential quarters for their sweepers. The Sangh helped the cooperative society of sweepers at Ranavar in Kathiawar to build quarters for sweepers. Six Sweeper's Sevaks were working for the welfare of the sweepers in different parts of the country under the new scheme started by the Sangh.

After independence the work of the Sangh was increased manifold. The Central Board of the Sangh in its meeting held on 15th and 16th November, 1958 discussed the hardships of the sweepers and scavengers and welcomed a suggestion by Shri Appa Saheb Patwardhan that a permanent exhibition be organised at the Headquarters of the Sangh in Delhi where models should be displayed of improved latrines and implements for cleaning and removal of night-soil. The Sangh had been receiving grants from the Central Government for Bhangi Kashta Mukti programme. The Sangh runs this programme through the Safai Vidyalaya at Ahmedabad. The 78 scavengers sevaks employed by the Sangh were working in 14 branches, contacting municipal authorities for the betterment of the working and living conditions of the sweepers and encouraging the sweepers themselves to adopt more scientific ways of work. They also helped in the formation of credit cooperative societies and 125 of these were functioning. There were in addition, a large number of industrial, housing and agricultural societies, which they encouraged. As a result of the work of these scavenger sevaks, more than 7000 wheel-barrows were supplied to the scavengers and about 400 residential quarters constructed for them.

The Sangh felt that while emphasis is to be laid on improved methods of working for the sweepers, it was clear in its intention that the ultimate goal was to make it unnecessary for man to carry or clean human excreta and therefore the Sangh had been laying emphasis on better types of latrines. But, it was long cry to the day when even all the municipalities in the country, could claim that every single latrine within their jurisdiction had sanitary fittings. The attack was, therefore, two pronged. On the one hand, the Sangh and its workers devoted great attention to the welfare of sweepers and improvement in their methods of work, at the same time it was trying to persuade the municipalities and other

local bodies to make it obligatory for house-owners to have only sanitary latrines.

GANDHI SMARAK NIDHI

The Gandhi Smarak Nidhi was established in Delhi in 1956 under the chairmanship of late Appa Saheb Patwardhan who was also the founder chairman of the Bhangi Mukti Samiti. It was set up in the same year with a view to liberating scavengers in India. In 1962, the *Maharashtra Gandhi Smarak Nidhi* was set up as a separate unit. But, in the beginning, this State branch tagged its activities with the Central Gandhi Smarak Nidhi. The Founder Chairman of this unit was late Mamasahab Deoginkar. After the Gandhi Centenary Celebrations of 1969, the state branch started working as an independent unit (1970). It was engaged in village uplift, propagation of Gandhian philosophy, publication of Gandhian literature and in scavengers' liberation work.

The Nidhi has been converting the service latrines into pour-flush sanitary latrines which did not need scavenging. Pioneering experiments in this field were done by *Appa Saheb Patwardhan* at Gopuri Ashram in Ratnagiri district of Maharashtra. Based on his work, the Nidhi decided to popularise two types of latrines, one was the *Sopa type*, in which the pan is not water-sealed, but is provided at the delivery end with a hinged metal plate and other one is *Naigaon* latrine, which is a modified aqua privy in which effluent collects in containers for use as fertilizer in farms. The Nidhi established a separate cell called *Bhangi Mukti Yojna* to popularise and construct sanitary latrines. Work of extension, persuasion and also the setting up of sanitary latrines had been undertaken by the cell which also motivated people in rural areas to set up sanitary latrines. Films and slide shows, group meetings, exhibitions, *bhajans*, *kirtans*, posters and leaflets were held to popularise the scheme and liberate scavengers.

The Nidhi had its own manufacturing workshops where pans were manufactured and water-seal traps cast from cement mortar and marble chips. Training programmes were organised for social and municipal workers on its projects. Regular training camps and lectures were arranged for municipal and Zila Parishad staff at various levels. Besides, the Nidhi imparted a 15-day training course in latrine construction and 10-days training in biogas plant construction to local technicians; stipends were also given to

trainees. The Nidhi had included in its programme the construction of biogas plants and in that work Dr. Mapuskar had rendered a very valuable service to the organisation as its honorary adviser. Initially, the Nidhi gave 50 per cent subsidy to farmers and took up the work of constructing biogas plants based exclusively on human excreta. Unfortunately, the progress of biogas plants was not as fast as expected due to high cost and absence of immediate gain. Repayment of loan also presented difficulty.

The organisation also constructed 70,000 latrines in 27 districts of Maharashtra and commissioned 500 biogas plants. It had trained a large number of field staff, organised training camps for social workers engaged in different voluntary organisations and carried out other allied programmes. Masons and technicians were trained. The Government of Maharashtra, municipalities and Zila Parishads gave full cooperation to the Nidhi. They have been directing their administrative and field staff to take up latrine construction work vigorously. Some of them subsidized the cost of construction to villagers who adopted the design prepared by the Nidhi. The Maharashtra Government has started giving mosaic pans free of cost to the adopters through zila parishads. All these were major steps towards liberation of scavengers.

SAFAI VIDYALAYA

The *Safai Vidyalaya* in Ahmedabad, a sanitation institution, was set up by the Harijan Sevak Sangh at Sabarmati Ashram in 1963 under the charge of Ishwarbhai Patel. The building in which the institute is accommodated is named as *Parixit Sadan* in memory of late Mr. Parixitlal Mazumdar who was a pioneer in the Gujarat Harijan Movement and devoted his life to their uplift. The Vidyalaya, in keeping with the objectives of the Harijan Sevak Sangh, undertook the programmes touching all aspects of scavengers' life: social, economic and educational. Its activities included training, use of improved implements for cleaning latrines, etc. for all concerned staff, including junior and senior engineers, masons, sweepers, scavengers and sanitary inspectors of primary health centres in rural areas, besides social workers engaged in Bhangi Kashta Mukti. Short-term courses for policy-makers and administrators were also arranged at various levels to convince them of the importance of sanitation. The training programme comprised practical demonstration in general cleanliness, technique

of conversion of dry latrines into waterborne types, construction of new handflush sanitary latrines needing no scavenger service, modification of byelaws of local bodies, use of improved implements for sanitation, etc.

The utility of the Vidyalaya had been recognised by the State Government, municipalities, district and Taluka panchayats and educational institutions, the universities and people in general. They have often been calling on the Vidyalaya for organising camps, seminars and conferences. Various national and international agencies and organisations had taken note of the valuable contributions made by the institute in the field of low-cost pourflush latrines and rural sanitation.

The impact of the Vidyalaya has been enormous. There is general acceptability of the expertise made available by it to workers, engineers, municipalities, panchayats and government departments and private users. The Vidyalaya has kept a close contact with local institutions. About 1,200 Panchayat workers and dozens of chairmen of district and Taluka Panchayats have been trained by the Safai Vidyalaya. The UNICEF has provided a mobile van to the institution with models, charts and arrangement for showing films. The mobile van is being used extensively in rural and slum areas of some of the cities for educating the masses.

GOVT. AGENCIES

During the Gandhi Centenary year, the Centre took up special programme for converting dry-latrines into water-pour flush latrines. Under this scheme, the householders were provided 25 per cent subsidy and 75 per cent loan recoverable in easy instalments. The householders were also allowed to connect their services latrines to nearby public sewers, if any.

The Central Ministry of Works and Housing, which is now a separate ministry, (earlier, it was a part of the Health and Family Planning and Urban Development Ministry) issued a circular in 1968, directing all the State governments to get the bucket privies converted into water-borne latrines and connect them to sewers, wherever available, or to any other disposal system at the earliest so that the scavengers could be free from the demeaning practice of carrying night-soil during the Gandhi Centenary period. The Centre said this would be the best tribute to the Father of the

Nation. Three States, Bihar, Gujarat and Kerala, took up the programme in right earnest. The service latrines not being made in Kerala, almost all of them were got converted into sanitary outfits.

Gujarat also took up in a big way the programme to liberate scavengers. Bihar topped in the country. The Central Ministry of Works and Housing, organised the following seminars with the collaboration of the WHO, UNICEF, UNDP and the Governments of Bihar, Rajasthan and Tamil Nadu. National Seminar on Conversion of Bucket Privies into Sanitary Water-borne Latrines was convened by the Government of India in collaboration with the UNICEF at Patna in May 1978. The International Seminar on Low-cost Techniques for Disposal of Human Wastes in Urban Communities, was sponsored by the UNDP and the Government of India in Calcutta, February in 1980. The Regional Conference on Low-cost Pourflush Latrines, sponsored by the Government of India and the Government of Rajasthan in collaboration with UNDP, was held in Udaipur, in August 1982. The Regional Seminar on Low-cost Sanitation was organised by the Ministry of Works and Housing, Government of India and UNDP, October 1982. The National Seminar on Integrated Development of Small and Medium Towns" was held in New Delhi, 1982.

These seminars created impact and motivated the State Governments to take up the scavengers liberation programme. The Central Ministry of Works and Housing also started giving loans to small and medium towns under the Integrated Development of Small and Medium Towns (IDSMT) project for the conversion of dry latrines into hand-flush water-seal ones. The National Building Organisation (NBO), which is a part of the Central Ministry of Works and Housing, has been working on various low-cost sanitation designs and is also trying to make them popular through the media.

The Ministry of Home Affairs also initiated a centrally-sponsored scheme in 1958 for improving the working and living conditions of sweepers and scavengers. Under the scheme, financial assistance was provided to State Governments for supplying wheelbarrows and hand-carts to sweepers and scavengers employed by the municipalities for scavenging work so that the practice of carrying night-soil as headload could be eliminated altogether. This assistance was given to the municipalities subject to the condition that 50 per cent of the total cost would be paid by the

municipalities from their own funds without any assistance from the state governments and the grants-in-aid would be admissible to such local bodies which agreed to stop the practice of carrying night-soil as headload or manual handling completely and not to those who may like to take up the scheme in piecemeal. In spite of the financial assistance, the response from the State Governments was poor and the demands for only Rs. 16 lakh were received from all over the country during 1958-59.

This matter was also considered by the Estimates Committee of the Lok Sabha in 1959 under the chairmanship of Mrs. Renuka Roy. The Committee urged the Ministry of Home Affairs to take interest in the scheme and impressed upon the local bodies the urgent need to abolish the practice of carrying nightsoil as headload. The Government of India accepted the recommendations of this committee and included this scheme under centrally-sponsored schemes during III and IV Five-Year Plans. The scheme gained momentum in the beginning of the third and fourth Five-Year Plans but the sweepers and scavengers lost their interest in the scheme due to the following reasons:

1. The designs of the wheel-barrows was not suitable for women and children; it was too heavy to be handled by them. It was a well-known fact that a majority of the women-folk and children work as scavengers in the households. It was very difficult for them to carry heavy wheel barrows/hand-carts to places at higher altitude or on the slope.
2. No financial assistance was provided to the municipalities for their maintenance and repair.
3. There was no arrangement for parking the wheel-barrows; with the result, they were taken by scavengers to their houses.
4. The improved implements like receptacles, scrapers, improved brooms, brushes, gumboots, hand-gloves, etc. were not supplied to all scavengers and, if supplied to some, they were seldom used by them.
5. It was noticed that in some municipalities 50 per cent contribution, as envisaged in the scheme, was not forthcoming.

The scheme failed and was discontinued during the fifth Five-Year Plan. The State Governments were, however, advised to continue the scheme under their state plan. A number of State Governments have discontinued the scheme but some of them

retained it.

It was in March 1981, when the Ministry of Home Affairs took the initiative of introducing a comprehensive scheme for the liberation of scavengers from the degrading system of scavenging, a meeting was held under the chairmanship of Mr. Bhisham Narayan Singh, the then Minister of Works and Housing, to discuss the proposal of the Bihar Government for liberation of scavengers. This meeting was attended by the Secretary, Ministry of Home Affairs, Mr. P.S. Krishnan, Joint Secretary, the Ministry of Home Affairs, Minister of Urban Development, Bihar, and Secretary and other officers of that department. It was decided at the meeting that a scheme may be introduced for the total elimination of scavenging in the selected towns on the 'whole-towns approach' basis.

The scavengers may be liberated from this system and given alternative jobs without any loss of income and both liberation and rehabilitation should be done simultaneously without time gap. Since there was no other scheme where this proposal could be accommodated, it was agreed that the liberation of scavengers was one of the measures for removal of untouchability, which could be taken up under the centrally-sponsored scheme of implementation of protection of Civil Rights Act. The State Government was asked to make a comprehensive scheme for the liberation of scavengers in the two selected towns of Biharsharif and Purnea, and this proposal should also include a scheme for the rehabilitation of liberated scavengers. The Government of Bihar, accordingly, submitted the proposal to the Ministry of Home Affairs in March 1981. The Ministry of Home Affairs after a good deal of discussions with Financial Adviser approved the scheme and released the Central share of Rs. 63.00 lakh to the state Government on the matching grant basis. Thus, a beginning was made in Bihar (1980-81) and, subsequently, the scheme was introduced in other states as well.

Under the scheme, financial assistance was provided to the state governments on the matching grant and "whole-town approach" basis. The state government, in turn, provided financial assistance to the local bodies for the conversion of dry latrines; 50 per cent of the total cost for conversion was given to the householders as subsidy and remaining 50 per cent as loan recoverable in easy instalments, irrespective of income. The householder had, therefore, not to spend money in the beginning

on the conversion of dry latrines which was done by the local bodies itself through voluntary agencies or contractors by inviting tenders. Before a town was taken up under the scheme, a preliminary survey was carried out with a view to collecting some basic information like family composition of the scavengers, marital status, age group, educational qualifications if any, etc., to enable the government make suitable schemes for their rehabilitation.

THE HUDCO INITIATIVE

The Housing and Urban Development Corporation (HUDCO), set up by the Government of India in 1971, is a leading financing and technical institute in the country, promoting housing and urban development. It started in 1983 financing basic sanitation schemes with a view to ending scavenging. It charged nominal interest on lending. It has always been promoting the two-pit leaching system (Sulabh Shauchalaya) for low-cost sanitation scheme launched under the International Drinking Water Supply and Sanitation Decades. HUDCO later made funding terms more liberal and project cost of up to 50 per cent was made available to all beneficiaries irrespective of their income, to be repaid in 12 years at an interest rate of six per cent. The difference between the total project cost and the loan amount sanctioned (and cost overrun, if any) is met by the borrower.

HUDCO received and cleared applications from agencies authorised by the Government to carry out programmes for providing basic sanitation facilities schemes. These agencies included housing boards, slum clearance boards, development authorities, improvement trusts and local bodies. The financial assistance was given to the projects on conversion of dry-pit latrines into water-seal pourflush latrines (Sulabh Shauchalayas) and also for new latrines. Community latrines, public baths and urinals are on the HUDCO funding list. The borrowers were required to give detailed project reports containing description of the proposals like the location, proposed system of sewage disposal supported with drawings, specifications, cost estimates, implementation period and the system of post-implementation maintenance. The proposal for provision of individual latrines or community latrines with disposal arrangements had to conform to the established norms in the field.

MINISTRY OF WELFARE

The Ministry of Welfare was created on September 25, 1985 after separating the subject like welfare of the handicapped, social defence, drug abuse, etc. from the parent Ministry of Social Welfare; and, Scheduled Castes Development, Scheduled Tribes Development, Minorities and Backward Classes wing of the Ministry of Home Affairs. Thus, the work earlier handled by the Ministry of Home Affairs, including the welfare and development of the Scheduled Castes and Tribes, was transferred to the newly created Ministry of Welfare. The work of liberation of scavengers was, thus, taken over by the new Ministry of Welfare about the time, the seventh Five-Year Plan was launched. The pattern of the scheme remained unchanged and the work tempo gained momentum under the new Ministry. An allocation of Rs. 39.07 crore was made for the scheme during the seventh Five-Year Plan.

INTERNATIONAL AGENCIES

International agencies like WHO, UNICEF and UNDP have played a crucial role in sanitation programme. Although they have not worked for low-cost sanitation, yet they helped liberate scavengers from the demeaning practice of carrying nightsoil. When in Bihar a controversy was raised by the Public Health Engineering Department on the pollution of the source of drinking water, the World Health Organisation (WHO) settled the controversy. Or else the entire programme would have suffered a setback. WHO, with the help of the Central Ministry of Works and Housing and UNICEF, organised a seminar in Patna on the conversion of bucket privies into water-seal latrines in 1978, in which the secretaries of Urban Development departments, chief engineers of almost all the State Governments; representatives from the All-India Institute of Hygiene and Public Health, Calcutta; National Environmental Engineering Research Institute (NEERI), Nagpur; Planning Commission; Director-General of Health Services; World Bank, WHO and UNICEF participated.

Seminar recommended that the two-pit system should be adopted in the hand-flush watersealed toilets. This was a historical decision when the technology of conversion of dry latrines into handflush water-seal latrines got approval from most competent national and international experts. The recommendation was

printed by WHO and circulated among the authorities concerned after engineers and others were convinced about the technology. WHO also circulated an article written by Mr. Jitendra Tuli, public relations officer of WHO, which created considerable impact on planners, administrators, engineers and decision makers. An international workshop was organised by WHO on health care in 1983, in which low-cost sanitation was discussed threadbare. The workshop recommended that sanitation was very much related to health care and thus, the scope of low-cost sanitation was expanded to include a lot more than the mere liberation of scavengers which, however, continued to be the central thrust of the programme.

UNICEF ROLE

UNICEF has also played an important role in the sanitation programme of India. It has helped in having hand-flush water-seal toilets in schools and funded the construction of hand-flush toilets in schools under Integrated Child Development Services programme. UNICEF also involved itself in bringing about improvement in the sanitary condition of Andhra Pradesh, Orissa, Uttar Pradesh, Madhya Pradesh, Jammu & Kashmir and Bihar. This international agency collaborated with WHO and the Ministry of Works and Housing of the national seminar in Patna and it bore the entire expenditure of the international seminar organised in Calcutta. A National Workshop was organised by UNICEF in Sri Lanka in which I was invited to participate as a "resource person". UNICEF has hitherto sponsored the visit of experts of different countries, including from Sri Lanka, Bangladesh, Nepal, Afghanistan, Vietnam, Ethiopia, the USA and Indonesia, to Patna to see the low-cost sanitation programme. Apart, from distributing the literature on low-cost sanitation by UNICEF, the concept was propagated through media, including slides. UNICEF also sponsored the programme for training of masons and engineers in low-cost sanitary toilets.

UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)

UNDP, whose executing agency is the World Bank, started its activities in India in the field of low-cost sanitation in 1978. First, it got evaluated low-cost sanitation programme already being carried

out in Bihar and Gujarat. Secondly, a study on the possible pollution of drinking water sources from the pit latrine was done in Bihar, Gujarat and Tamil Nadu in collaboration with the Prevention and Control of Water Pollution Board of each State. UNDP also had designs of the low-cost sanitary latrine made by the Central Building Research Institute, Roorkee, (UP). It took the assistance of the All India Institute of Health and Hygiene, Calcutta; National Environmental Engineering Research Institute, Poonamallee; PRAI, Lucknow and finally prepared a manual on low-cost sanitary toilets for its adoption in South East Asia, Latin America and Africa. The movement was globalised, with thrust areas being the poor countries of the Third World. This was a major development for which credit goes to UNDP.

The UNDP was requested in 1979 by the Government of India to help prepare master plans and preliminary engineering and feasibility reports on low-cost water-seal latrines for seven States of Assam, Bihar, Gujarat, Maharashtra, Rajasthan, Tamil Nadu and Uttar Pradesh. For this purpose, 20 towns were selected in Uttar Pradesh and 50 towns each in the other six States, in the first phase. The reports in respect of these States were completed in 1981, covering 110 towns. The studies related to the conversion of dry latrines into low-cost water-seal toilets, provision of individual sanitary latrines in houses and setting up community toilets for common use. The report created considerable interest in the Central Government. Encouraged by the studies, the Central Government requested UNDP to prepare similar feasibility reports for eleven States of Andhra Pradesh, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Orissa, Punjab, Tripura and West Bengal and three Union Territories of Goa, Mizoram and Pondicherry.

The UNDP studies helped the Government launch a Centrally-sponsored scavenging elimination programme with 50 per cent grant to convert all the dry latrines in 33 towns in Andhra Pradesh, Assam, Bihar, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal. UNICEF financed some demonstration units. The State Governments also started putting the low-cost pour-flush latrines and baths in project and non-project towns. While preparing the feasibility reports, it organised, supervised and financed, either partly or wholly, a number of special studies which included evaluation of ongoing latrine

conversion programmes in Bihar, Gujarat and Tamil Nadu; evaluation of the community latrines in Bihar maintained on the pay-and-use basis; designs of pourflush latrines; optimisation of pourflush latrines technology use; sociological study on the impact of latrine conversion on scavengers; institutional, financial and legal studies of 20 local bodies; and studies on soil and water pollution and the on-site disposal of human excreta were conducted in Bihar, Gujarat and Tamil Nadu. UNDP had also played a very important role in the diffusion of the concept of low-cost sanitary latrine. The engineers, who were hesitant to accept the technology, now recommended its adoption in urban areas. UNDP got organised an international seminar in Calcutta, a national seminar in Delhi and two regional seminars in Rajasthan and Tamil Nadu. At all these four seminars, the adoption of low-cost sanitary toilets in urban areas was unanimously recommended.

MINISTRY OF URBAN DEVELOPMENT

The Ministry of Urban Development has taken up the Centrally-sponsored scheme of "Integrated Development of Small and Medium Towns" (IDSMT) since the sixth Five Year Plan. The scheme consisted of plans for drinking water and low-cost sanitation. Under the scheme, Rs. 15 lakh was provided as loan exclusively for each town selected for integrated development. This scheme was not meant exclusively for conversion of dry latrines into water-borne latrines on the "whole-town" basis but covered only part of the town. There was no provision in the scheme for training and rehabilitation of displaced scavengers. This scheme had been taken up from the sanitation point of view without having concern for scavengers. The response to this scheme was, therefore, very poor. Under the scheme 43,465 dry latrines and 641 community latrines were converted into sanitary ones in 12 States up to March, 1988 at an estimated cost of Rs. 10 crore.

MINISTRY OF ENVIRONMENT AND FORESTS

Under the Ganga Action Plan launched by the Ministry of Environment and Forests, low-cost sanitation in the towns along the Ganga in Uttar Pradesh, Bihar and West Bengal also formed an integral part. It was necessary to set up sanitary latrines in the towns along the river into which human excreta flowed. So

this was part of the Ganga Action Plan. The Ministry had released grants of Rs. 12.34 crore to the three States for the conversion of 24,999 household dry latrines and 10,760 community latrines in 36 towns within a radius of two km along the river bank. This scheme had been taken up primarily from the point of view of cleaning the Ganga and not for liberating scavengers; it has no rehabilitation scheme for liberated scavengers. This scheme had impact on the sanitation situation.

DEPARTMENT OF RURAL DEVELOPMENT

The problem of liberation of scavengers in rural areas is not acute because the entire population defecates in fields and hardly 0.5 per cent of the rural population has access to sanitary facilities. The Ministry of Rural Development had taken up low-cost sanitation scheme for the construction of new water-pour latrines in rural areas but the progress was slow. However, a beginning had been made towards rural sanitation which is becoming very important to promote in view of expanding population and diminishing cover for open defecation. ●

A blow-by-blow account of sanitation movements in India since ancient time

Man in the palaeolithic period is identified by his tools of the *Chelleo Acheolean* type, generally made from quartzite. Palaeolithic and Neolithic age tools and objects were discovered in the excavations at Pallavaram near Madras (1863) and peninsular India, Cuddapah District, Kurnool caves and Nellore district (1864), some portions of Bihar, Gujarat and Orissa, Paithan on the upper Godavari (1865), Bhuttra on the Narmada (1873), West Coast of Mumbai (1932), Assam, Bengal, Jammu and Kashmir, North-Western Punjab, Sind and Narmada Valley and near Attirampakkam, Madras (1935), Valley of the Soan near Rawalpindi, eastern Coast of Orissa near Mayurbhanj, the Valley of Burhabalang river and its tributaries (1940), Maski in Hyderabad (1942), Brahmangiri and Chandravalli in Mysore (1948), and Sanganakallu in Bellary (1948), Langhnaj in Gujarat, Mirzapur District and Singrauli (1949), Tirunvelveli in Madras (1950), Mahi and Sabarmati in Gujarat, Nimar district in Madhya Pradesh, Nasik on the Godavari, Malaprabha Valley in Karnataka, Chittorgarh in south Rajasthan (1951-56), and Nevasa (Ahmednagar), Sutlej-Sirsa Valley, in Kangra, Punjab (1956).

SANITATION STATUS: Defecation in the open was widely practised as people lived in the jungles, dense forests and caves. The idea of health hygiene or sanitation was unknown to them. There was no danger of insanitation either because there were not many people around. And, the concept of city was never thought of. It was a primitive life but unpolluted.

INDUS VALLEY CIVILISATION

In 1922 when railway lines were being laid between Karachi and Lahore, ruins of ancient cities of Mohenjo-daro in Larkana District of Sind and Harappa in Montgomery District of Punjab were discovered. The epoch-making discoveries revealed that in the third millennium BC, a full-fledged advance civilisation flourished over 5,000 years ago. The Indus Valley Civilisation has been recognised as very advance alongwith Iran, the Sumerian culture to Mesopotamia or the Egyptian to the valley of the Nile. The

remarkable and imposing of all the remains was the *Great Bath* (as was found amid Roman ruins later) situated in the citadel mound at Mohenjo-daro. It measures 180 ft. from North to South and 108 ft. from East to West. Its outer massive walls, were 7 to 8 ft. thick at the base. The solidity of the construction is amply borne out by the fact that it has successfully withstood the ravages of five thousand years. The first invaders, the Aryans, came from the Iranian plateau. They entered India from the North-West, settling at first in the Punjab and destroyed, the cities in 1,500 BC of the *Indus Valley Civilisation* vanished.

SANITATION STATUS: The characteristic feature of these cities was wide streets and lanes with underground drainage though water discharged from smaller drains coming out of the houses or bylanes was collected into cesspools, built either entirely of masonry or with earthenware jars. At Harappa, drains from bathrooms, courtyards and other parts of the houses were quite common. At Mohenjo-daro, earthenware drain-pipes have also been found. Latrines were fairly common and rubbish chutes were also not unknown. Frequently, cesspools, either structural or lined with pottery jars, were connected with drains coming out of houses, but sometimes they were converted into soak-pits by knocking out the bottom of the jar lining or by not paving the structure. From the regular alignment of thoroughfare, lanes and bylanes, on which encroachments appear to have been rigidly prevented and the elaborate sanitary arrangements, it may be concluded that some sort of efficient municipal administration must surely have existed. The agricultural based life did not pose any problem of disposal of garbages and other wastes. Garbage, human and animal excreta were easily deposited in the fields and they turn into organic manure. This was the high point of the sanitation status.

VEDIC INDIA

During the Rig. Veda period, the Aryans had already reached a high state of civilisation. In knowledge, power and in social organisation, they had attained a high level. In the whole history of India, the *Vedic Age* has been recognised as ideal and the attempt in all subsequent ages has been to approximate the life of man to the conditions of the Vedic Age. According to scriptures and other literature, scavenging, (especially the disposal of nightsoil by a particular caste or castes of Indian society), has been in

existence since the beginning of civilisation. One of the fifteen duties for slaves enumerated in the '*Naradiya Samhita*' was to dispose of human excreta.

SANITATION STATUS: Aryans were a vibrant people, full of joy and energy and their hearts filled with love for all living beings. Cleanliness and hygienic way of life came to them naturally and effortlessly. In the Vedic period there were villages and also towns with proper drainage facilities. The Vedic Aryans had good brick-built homes which contained bathrooms, ponds, water-tanks etc., but there were no toilets inside the house. They had to go outside for this purpose. After attending to the nature's call, it was compulsory to go to river or pond for a bath. Bath is regarded as the complete washing off of physical, moral and spiritual impurities. The early Aryans bequeathed to their future generations a dual sense of sanitation. They divided hygiene into two parts: (a) personal and (b) social. Both were stressed equally and were considered equally important. This balanced approach towards sanitation and the science of personal and community health was maintained till the Puranic age and even later.

POST - VEDIC PERIOD

With the rise of Buddhism, there arose, within the vast area comprising the Indo-Gangetic plain and the Malwa tableland, a chain of territorial states, which were small, were of two principal types, namely the monarchical and the republican known as *Sangha* or *gana*, each trying to dominate others. As a reaction against the inflexible Brahmins, two new religions were born, Jain religion founded by Vardhamana, known as Mahavira (599-527 B.C.) and the other Buddhism by a Sakya prince, Siddharta of Kapilvastu near Nepal border, called Gautam Buddha founder of the Buddhist religion (563-483).

SANITATION STATUS: Vatsayayana in his *Kamsutra* has pleaded that house should not be in clusters but separate airy, full of ventilation, having soak pits and sewerage and drainage for the exit of used water. The '*Manusmriti*' says that all our organs must be kept clean and in good condition by daily wash and ablution. Men and women shall wash away their dirt with water everyday - this is the means to cleanse their body, but reading the *Gita* will keep their mind and heart clean of all impurities. In Vedas, it has

been made clear that driving away diseases and invitation to strength is definitely not possible without proper sanitation and adoption of hygienic rules. In the rural areas the application of manures in the agricultural fields include animal excreta (but not human excreta), fish, bone, beef and various kinds of decoction.

ALEXANDER THE GREAT

Alexander the Great destroyed Darius-III's Persian empire and invaded India, bringing with him the influence of *Hellenic* culture. His campaign was a short-lived one. He had to turn back as his home-sick soldiers refused to march against the powerful *Nandas*. His general, Seleucus Nikator, inherited his conquests, extending from Asia Minor to India. Seleucus tried to proceed against Magadha, but was defeated by Chandragupta of the Maurya dynasty.

MAURYA PERIOD

Towards the end of the 4th Century BC, the Nanda dynasty was ruling in Magadha; from them sprang the Maurya who in Circa 320 B.C. succeeded in founding the first pan-Indian empire. A young Magadha warrior *Chandragupta*, revolted against his sovereign just as Alexander the Great was reaching the banks of the Indus According to Plutarch (Alex; LXII), he solicited the help of the Greek conqueror but Alexander who had to confront the powerful army of Poras, ruler of Sind and Punjab, was unable to accede to the request of Chandragupta. Alexander defeated Poras but allowed him to retain his kingdom. Chandragupta, came to the throne of Magadha, overthrowing the Nanda dynasty. The Maurya empire soon stretched from the Indus to the Ganges and became one of the great world powers. He married the daughter of Seleucus. The Maurya dynasty reached the height of its power with Bindusar's son, the famous Emperor Ashoka (264-27 BC). After his bloody conquest of Kalinga, (which stretched from the delta of the Godavari to that of the Mahanadi in Orissa) he experienced a spiritual crisis and was converted to Buddhism. During his reign Buddhism became a powerful civilising influence; with his encouragement it spread to Kashmir, to the Hellenised territories and even as far a Ceylon, Burma, China, Japan and Indo-China etc. His empire comprised the whole of north and

north-west India and extended as far as Andhra (the lower Valley of the Godavari and the Krishna).

SANITATION STATUS: Seleucus left behind nobles who were called Bactria. They could not leave marks on Indian life and vanished into the pages of history, unsung and unwept.

BACTRIA (NOBLES THAT ALEXANDER LEFT BEHIND TO RULE THE TERRITORIES HE HAD CONQUERED. THEY WERE BACTRIA)

After the death of Ashoka, the Maurya empire gradually broke up and the centre of power shifted to Malwa and Magadh under the Sungas and then under Kanvas. Indo-Greek kingdoms were founded in Bactria, Gandhara and Kapisa. One of the kings of Bactria, Demetrius undertook the conquest of India in about 189 and reached as far as Pataliputra. Sungas drove the Indo-Greeks beyond the Indus. In about 80 BC, the Greek Kingdom of Bactria fell under the attacks of semi-nomads who had been driven from Central Asia by the advance of the Huns from Mongolia.

KUSHAN DYNASTY AND SUCCESSORS

In the 1st century A.D. a new force was being built up in the north-western regions, that of Tokharian nomads, the Kushans, who had come from Khotan in central Asia. They conquered the Parthians, seizing Kabul and the whole of the Punjab, and thrust out towards the east and south. Their empire extended from the Oxus to the Ganges plain. Kanishka was their third sovereign.

SANITATION STATUS: According to Megasthenes, Patliputra was a large and beautiful city. It was over nine miles long and nearly two miles wide, and the public buildings, the palace and the great city walls were made of wood. The city was well equipped with proper drainage system and soak-pits. No body was allowed to defecate in the open. The abundant forests, which at that time covered a far larger area than today. Chanakya's 'Arthshastra' gives a full account of the Maurya administration and how the cities were kept neat and clean by following proper sanitary system. For every ten families in the towns and cities there was a public well used by all. The throwing of garbages and rubbish on the streets was forbidden and offenders were punished. There was no

water logging on the roads, lanes and bylanes. It was the duty of the residents to construct drain for cleaning stagnant water and any failure to do so was punishable with fine. There were public baths in the cities with regular supply of water all the times. It seems that these public baths were connected with some pond, river or stream. It was the duty of every citizen to take bath before sun rise, clean the teeth, get the body scented, put some *surma* in the eye and eat with music.

GUPTA DYNASTY AND SUCCESSORS

In about 320, a new power emerged, that of the Gupta. This dynasty originated in Magadha and reached its height in the reign of Chandragupta (375-414) and Kumargupta (414-55). India then enjoyed one of the most brilliant periods in her cultural history. Their empire was extended over a large part of India and their influence in Southern India was considerable.

The White Huns from Bactria appeared on the frontiers of the Gupta empire. Though Sikandargupta (455-67) succeeded in repulsing them but their incursion was nonetheless the beginning of a weakening of Gupta power. The Huns destroyed practically all the Buddhist stupas, monasteries and universities and the monks persecuted. The Gupta dynasty survived but its princes were now little more than local heads of state. The northern states taking advantage of the weakening of the Guptas, consolidated their own power. Among them was Thaneshwar, at the eastern end of Doab (a region between Ganga and Jamuna) with Kanauj its capital under King Harsha Vardhan (605-47); northern and central India was rejoined under a single ruler for the last time before the medieval period. Huan-tsang (629-45), a Chinese Buddhist traveller visited India during Harsha Vardhan's reign. Meanwhile the Kingdoms of the Deccan flourished particularly the Pallava in the Tamil regions and western Chalukya in Maharashtra. The Pala sovereigns in Bengal (765-1086) protected Buddhism and made the University of Nalanda prosper once again.

SANITATION STATUS: During the Bactrian and Sungas period the towns and cities were not so well organised. The houses were constructed in a very haphazard manner without any drainage facilities. There were narrow lanes and bylanes. Everybody was free to use it in anyway he likes. The city of Taxila was a seat of learning and well planned during the Buddha period but later

destroyed by the invaders. People used to go outside for open defecation. The houses were divided according to the caste and communities. Very little information is available so far as this period is concerned.

THE MEDIEVAL PERIOD

The Muslim invasions interrupted with dramatic suddenness the cultural development of many Indian states. Islam's conquering armies arrived in the Punjab as early as 775 and gradually reached each of the states in turn. They captured Kanauj in 1019 and the whole of Punjab was conquered in 1022, Bihar and Bengal in 1199 and Gujarat in 1297, Maharashtra in 1317 and Pandyas in 1310, and Hoysala (Vijayanagar) in 1565. Mohammed of Gazni had invaded India over a dozen times between 1000 and 1026, two hundred years later in 1221, Chengizkhan invaded north; and still later, Timurlane in 1398. After the beginning of the 13 century, Mohammed Gori founded the powerful Sultanate of Delhi which extended its sovereignty over several states of the South-Slave dynasty (1206-90), the Khiljis (1290-1320), the Tughlaqs (1321-1413) and the Lodis (1414-1526). In the 14th Century, however, the Sultanate began to break-up into ten or so local dynasties, until in 1526 it was conquered by Babar after defeating Ibrahim Lodi at Panipat.

SANITATION STATUS: During Kushan period the cities were well planned with proper drainage system. Water-logging was not there, people used to go to the nearby fields, groves etc. for nature's call.

MUGHAL EMPIRE

Babar, a descendant of Timur, founded Mughal Empire in 1526. He was succeeded by his son, Humayun, but Humayun suffered defeat at the hands of an Afghan general, Shershah Suri. Shershah ruled India for 5 years. He died in an explosion at Kalinjar. Humayun later regained his lost kingdom after defeating the Shershah's successors. Humayun was succeeded by Akbar (1556-1605) Jahangir (1607-27), Shahjahan (1627-58), Aurangzeb (1659-1707). Bahadur Shah Zafar was the last Mughal Emperor who was deported to Rangoon in 1857 by the Britishers. During the Muslim rule enormous changes, cultural, religious and social, took place.

SANITATION STATUS: During the Muslim rule in India which lasted for over 300 years there was a total absence of social awareness about the values of community sanitation. They planted trees, established inns and charitable dispensaries all along the Grand Trunk Road, built masoleums over graves or forts showing their majestcity, but they overlooked rural life and living. After the advent of Muslims in India the term 'sweeping and scavenging' seems to have taken the form of a formal profession. It is said that system of bucket privies was designed and constructed by Muslims for their women in *purdah*. Those who were made captives, were forced to clean latrines, bucket privies and throw off the nightsoil at distant places. These captives when freed, were not accepted by the society and they formed a separate caste and continued the work of scavenging.

THE BRITISH RULE

Sir Thomas Roe was given permission by the Emperor Jahangir to set up factories in Surat and establish the *East India Company*. The British gradually expanded their possessions. By the Middle of eighteenth century, British succeeded in establishing their power in Bengal, Bihar, Orissa and the east coast (Battle of Plassey in 1757) and this was later extended and consolidated for the whole India. Warren Hastings (1774-85) was the first Governor-General. The most prominent amongst the Governor Generals of the East India Company were Lord Clive, Lord Cornwallis (1786-93), Marquis of Wellesley (1798-1805), Lord Dalhousie, Lord William Bentinck (1828-35) and the last Governor General was Lord Louis Mountbatten (1946-48). After the Revolt of 1857, the British Govt. took over the reign of administration from the East India Company and Queen Victoria was declared Empress of India in 1876. The British Govt. ruled India upto August 14, 1947.

SANITATION STATUS: Like Muslims, the British who ruled India for about 250 years paid no attention to create social awareness among masses against open defecation or their health and hygiene. If the Muslims lived in lavishness, the Britishers lived capriciously – both crawling for a continuity of their imperial grip over India. Rural sanitation was completely overlooked for over 500 years consequently. The Britishers had planned cities in a way that suited them: Civil Lines were inhabited by the white rulers with fine sewage and drainage system, while the other parts were left

out for the natives. The other part was perhaps the black city with no civic amenities. The Septic tank was introduced about 150 years ago. No Englishman settled in rural areas; they found this land full of mosquitoes, snakes and tigers. After the setting up of army cantonments and municipalities a large number of people were employed to do sweeping and scavenging services on a regular basis. The sewerage was introduced in India in 1870 but only in the civil lines. There were no toilets in the Indian Railways. It was in 1909 one Okhil Chandra Sen encountered, a very awkward situation owing to nature's call while travelling in a passenger train and being forced by the intensity of the call he had to get down from the coach on the platform at Ahmedpur station just to relieve himself of the pressure but in doing so he had the ill luck of being left behind on the platform as the train left the station as per guard's signal. Being aggrieved, he lodged with the Sahibganj Railway Division, Bengal, a complaint which forced the British authorities to provide attached toilet in railway coaches used by Indians.

AFTER INDEPENDENCE

SANITATION STATUS: The emergence of free India in 1947 brought to light the problem of sanitation which can brook no delay. It was Mahatma Gandhi who got focussed the attention of the Govt. to this problem. In the earlier five year plans the entire allocation earmarked for sanitation was spent on sewerage only yet there are hardly 232 towns and cities (out of 4689) with sewer lines. None of them, however, cover the entire municipal city areas, leave alone the adjoining suburbs included in the municipal limits. It was in the Sixth Five Year Plan a scheme for the liberation of scavengers was introduced with the twin objectives of conversion of dry latrines into water pour flush latrines and rehabilitation of liberated scavengers in alternative jobs. The scheme is in operation in an amended form but without any substantial achievement.

The widespread phenomenon of open defecation remains grim even after 50 years of India's Independence, especially women have to suffer a lot due to non-availability of toilets. Even today 110 million houses have no toilets and 10 million houses have bucket toilets causing filth and diseases. According to an estimate hardly 20 per cent of urban population have access to flush arrangement connected to sewerage system, 14 per cent have access to water borne toilets connected to septic tanks, 33 per

cent have bucket or dry latrines and the remaining, 33 per cent do not have access to any facility whatsoever. The rural sanitation coverage is now 17 per cent (1998) which was only 0.3 per cent in 1981. The situation is so appalling that about half million children die every year due to dehydration caused by open defecation.

SULABH SANITATION MOVEMENT

A non-Governmental non-profit Voluntary Social Organisation known as Sulabh Shauchalaya Sansthan was born at Patna on 5th March, 1970 which was later renamed as Sulabh International Social Service Organisation. In 1970 Dr. Bindeshwar Pathak, a 27 years old young social worker from Bihar founded a non-Governmental Organisation known as Sulabh Shauchalaya Sansthan (now called Sulabh International Social Service Organisation) which emerged as the most effective and dynamic non-profit voluntary organisation in the country. Sulabh developed a most appropriate, affordable, easily available, socio-culturally acceptable, low-cost technology (Sulabh Shauchalaya) to replace the bucket dry privies and to stop open air defecation, introduced for the first time in India, well designed and managed community toilet complexes with bath, washing and urinal facilities. Then it developed a proper delivery system including motivation, sanitation, education, implementation and follow-up. Following rapid adoption of Sulabh technology, more than 240 towns have been freed from scavenging and 40,000 scavengers liberated and resettled in other professions. It was possible by converting 8 lakhs of bucket latrines into Sulabh toilets. Sulabh is operating more than 3100 community complexes in 641 towns, used by 10 million people everyday. It has set up 68 human excreta based biogas plants all over the country. Sulabh technology was declared Best Urban Global Practice in low cost sanitation at Habitat-II Conference at Istanbul, Turkey in 1996. Sulabh International was granted special consultative status by Economic and Social Council of United Nations. Besides Padma Bhushan, several prestigious awards including the International Saint Francis Prize for the Environment "*Canticle of All Creatures*", Assisi, Italy, were conferred on Dr. Pathak, Founder of Sulabh Sanitation Movement.

(Source: "*The Manual Scavenging in India*" by B.N. Srivastava)

**King Louis XIII of France defecated
in the open but dined alone.**

History of evolution of toilets

Consumption and excretion are the two basic biological functions without which life on this planet would not be possible. However, man has always been concerned with meeting the consumption needs, far beyond the resources of the earth to support and much to the neglect of the waste disposal problem which is an area of major concern, specially in the developing countries which are going through the painful process of urbanization and population explosion. Toilet is precisely the place where civilization begins and tribalism ends. Man's status, social customs, cultural preferences and education are reflected in the choice of toilets.

People's preferences changed, so also their cultural values. For instance, King Louis XIII and XIV used to give audience to their subjects while sitting on toilet seat but dined alone; French and English Kings and Queens had their toilets laced with gold and velvet and the Versailles Palace had 274 toilets to cover almost twice as many rooms.

Toilets were also the place for political intrigues. Roman Emperor Heliogabab (222 AD) was assassinated in toilet, so also the English King James-1; Edward-II was attacked in toilet and barely escaped murder. In 1668,

construction of toilets was made compulsory in Paris. This is what we could not do now even after more than 300 years of progress in human civilization. Paris also reserved jobs for scavengers in 1696 we have not been able to do now. The system of paid toilet



Sulabh International Museum of Toilets, New Delhi

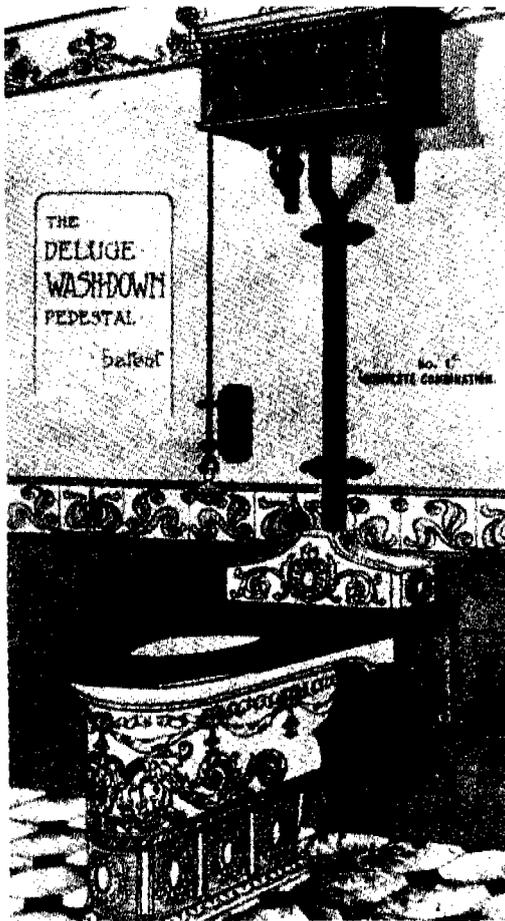
service came into practice in Paris in 1771; there used to be half-door latrines in Lyon (France) to keep boys and girls out of mischief. Sanitation law was first made in Britain 1846 but this did not improve the situation and cholera broke out in London in September 1848 which claimed a large number of lives. This was the beginning of the intense sanitation activities in Britain and setting up WCs in houses was made obligatory by law.

A close look at the history of toilets will make it clear that after the eastern (*Ottoman*) wing of the Roman empire was split from west, the sanitation movement, which was strictly an European phenomenon, stopped travelling east. With this historical interruption, and very unfortunate at that, most of Asia, Middle East and the Far-Eastern regions of the world could not get the benefits of the new sanitation concept. However, it did not matter as long as these societies were pastoral, but when industrialisation came, we were virtually caught pants down, as it were. We discovered that we did not have enough toilets in cities to go to. No wonder our cities stink and people defecate in nudity.

The known history of "*baths and bathing*" is almost 5,000 years old, beginning from Mohen-jo-Daro in the Indus Valley civilisation when every house had bathrooms fitted with terra cotta pipes encased in bricks. The sewerage system, drains and water supply were highly developed among ancient Cretans, Egyptians and the Incas. The Greeks were first to de-link diseases from magic and attributed them to the "imbalances between man and nature". And, thus, they recognised hygiene as a basis for healthy living.

Romans, who inherited the Greek concept of health and hygiene, were first to build defences against filth and pollution. They organised collective baths and toilet system. Strangely enough, Romans had gods of toilet (*Stercutius and Crepitus*) and goddess of sewer (*Colachina*) and Romans worshipped them while defecating in groups. The privy pots were cleaned by slaves.

In Rome also, public bath-cum-toilets were well developed. There were holes in the floor and beneath was flowing water. When the Romans travelled, they constructed toilets for their use. The stools were key-hole type so that these could be used for defecation as well as urination. Excavations in Sri Lanka and Thailand too have brought out a contraption in which urine was separated and allowed to flow while the other portion was used at the same time for defecation. Historical evidence exists that Greeks relieved themselves out of house. There was no shyness in use



Early decorated stoneware bath in Britain

of toilet. It was frequent to see at dinner parties in Rome, slaves bringing in urine pots made of silver. Members of the royalty defecated and played at the same time. This practice of covering waste with earth in India continued till the Mughal era. The period between 500 and 1500 AD was a dark age from the point of view of hygiene. It was an era of cess-pools and human excreta all around. Rich man's houses and forts in India had extended parts from which defecation was done and the excrements fell into the open ground or the river below. The forts of Jaiselmer in India and big houses on the banks of rivers bear testimony to this fact. In Europe, it was an era of chamber pots, cess-pools and cross-stools.

There was no toilet attached to individual houses. The toilet system acquired an established design in 1596 when Sir John Harrington (about whom we spoke earlier also), a courtier in the court of Queen Elizabeth, developed a design for WC (water closet) which finally grew to become what we have in our houses today. Sir John Harrington also worked on a flush WC which was installed in the Queen's palace at Richmond, Surrey. He wrote a book which angered the monarch who banished him from the court for profanity. The improved model of Harrington's WC, incorporating a stink trap was patented by a London watchmaker, Alexander Cumming, in 1775. Further improvements were made by a London cabinet-maker and inventor Joseph Bramah in 1778. These early

WCs were connected to cesspits and even after invention of stink-traps, smell from them must have been pretty strong. It was with the invention of the modern sewerage system in Hamburg in the 1840s, that the health of people improved. The finest of the 19th century sanitary engineer was Sir Joseph Bazalgette who, in the 1850s, equipped London with the an efficient sewerage system for which he invented automatic flood doors and new pipes sections which allowed speedier flow of effluent.

In Victorian times, the chamber-pot became a veritable object of art and even in the 1900s, inventors continued to work on new designs. In 1929, an American electrician, Elbert Stallworth, patented the first electric chamber pot for use in chilly nights. In the continental Europe, a series of inter-related developments took place which resulted in networks of massive sewerage system that continued to be in use today. Since then, the sanitation revolution has continued to brew although without making bold headlines.

The massive influx into cities in the wake of the Industrial Revolution created new kinds of sanitation problems. Cities expanded, rivers began to stink, a variety of industries along rivers only added to filth. The result being that sanitation which has always been a non-profit work done by official agencies became a big-time business. For instance, Lyonnaise Dumez, a Fresh company, is providing water and sewerage facilities for 10 million people in Buenos Aires, Argentina. Similarly, many private companies are taking over the work of waste disposal and water supply even in the developing countries. The history of evolution of toilets in Europe is, however, not complete.

For instance Lutyens (Sir Edweard L.) built New Delhi in 1919 for only five lakh people and now over 50 lakh people live in NDMC area alone, the total population of the Capital being about 10 million people (1998). The sewage carrying capacity of rivers is exhausted. The Yamuna is a nullah now, and the Ganga is no more holy; the massive discharge of effluents into these rivers, the lifelines of the country, has disturbed the balance between man and nature.

Human waste disposal, as a matter of fact, has always been a problem. The sewerage system solved the problem of rich countries but not of the poor nations where population grew far beyond the capacity of civic infrastructure to support. Most cities in the developing world are depending on septic tanks. In the remaining areas, people either defecate in parks or along railway

tracks or on road. In Jakarta (Source: *The Economist*, April 1994) some 800,000 households have installed their own septic tanks. Or, dry privies are serviced by scavengers. In China, family member themselves clean and carry excreta to dump at a common spot from where municipal agencies cart it away. They use hot water and, therefore, infection is curbed. No wonder, manually cleaned privies mushroomed in city suburbs and so also the number of scavengers.

American farmers collected excreta in cities at night for use in agricultural fields and, hence, we have the word "*night-soil*." Manual scavenging in Europe was done by slaves, serf, blacks or wanderers. Meanwhile, the sewerage system grew up fast and scavenger class disappeared in Europe. In India they are a class of untouchables, condemned and hated even by those whose excreta they carry on the head. For that matter, scavenging in India is a great human problem. And that is the source of the beginning of the Sulabh Sanitation Movement in India.

The following is the evolution story of toilets in chronological order

B.C.1375 In ancient Egypt, according to Herodotus, the noted historian, toilets were provided in the house but due to little rainfall in area, water closet did not develop much. Since river water was used for irrigation, excrements were not released into rivers; was stored inside the toilets and during the flooding of Nile river, waste was used as a manure mixed with fresh soil. It is believed that Amenhotep IV of the 18 dynasty began this practice of construction of toilets inside the house to prevent people from easing along road.

Around

B.C.1000 In the Bahrein island in the Persian Gulf, flush-type toilet was discovered. Stool seat was 12 cm above the floor level and there was a drainage hole in the front portion. There was a pit beneath from where the fossils of excrements were found. Around this time, use of rainy water for cleaning was considered but ended in a failure in the regions where the rainfall was scanty.

B.C. 615 Lucius Tarquinius, who established Etrurian rule over Rome, constructed the oldest sewer in Rome. This

"Cloaca Maxima" was meant for the waste water of the Forum Valley surrounded by seven hills. Initially, it was open drain type, as it was a wet zone but between BC 3rd and 5th century, it was covered with arch. It was further improved between 1st and 3rd century BC and the remains of sewer (4.2 m. tall and 3.3 m. wide) belonging to the 3rd century BC were found.

- B.C. 480 During the 3rd Persian War, Persian army that invaded Greece, suffered from plague caused by their own excrements and lost the war. Further, it was also because the Persians lived in the desert area and had the practice of excreting on sand. As found in Agra Fort, in Persia too, a well was dug and the human waste was mixed with soil.
- B.C.431 During the Peloponnesian war, Pericles called upon all the people to assemble in Ethens and in the absence of adequate sanitation facilities, within two years there were epidemics that caused many deaths. This is the oldest record of an epidemic. In Ethens, scavengers carried the night-soil and dumped it outside the city.
- B.C. 400 In Pionia, certain tribes had roof-top or river-top toilets.
- B.C. 380 Sewers, found in the ruins of Agora, were constructed during this period. In "Women's Parliament", there is a description of Ethens having no toilets and stools. A book "The Peace" describes slaves dumping human waste. According to Aristotle's "The Republic of Athenians", waste had to be thrown at least two kms away from the castle.
- B.C. 312 In Rome, 16.5 km. long Appia Waterway was completed. It was evident that Romans had learnt their lessons from Persian invasion of Greece and they gave utmost importance to sanitation. As a result, WC became popular as far as in Egypt and South France.
- B.C. 200 In the Antoninus Public Bath, there were 1,600 holes for defecation. In public toilets in Rome, toilet seats with hole in the middle were arranged in semi-circular shape and water flowed underneath to a hole for in the "Book of Deuteronomy" in the Old Testament", there is a sentence where Moses, as the leader of the Sem tribe, admonishes his tribemates against excretating in the open. He says, "You should search for some other place and bury your excrement." In the "Fourth Book

of Kings", it is recorded that the believers of Jehovah, destroyed the shrine of the Pagan Baarr and constructed a toilet in its place.

- B.C. 146 At the time of downfall of Karthago, there were four types of toilets in Rome:
- (i) Ranasa chain type seat with a golden or silver cover. Around 30 A.D., the floor under the seat was gouged out and then the chair type seat was set on the lowered surface.
 - (ii) Gastora, a pot kept by the roadside for the public and a detergent was obtained from urine.
 - (iii) Kroakina (Public toilet). It was a fully equipped structure having water supply and drainage facility.
 - (iv) Latorina (private toilet). It had WC and was widely used.
- B.C. 84 In Pompeii (Southern Italy), buried under volcanic eruption from Vesvios volcano, toilets were found. It had water supply system and common toilets. In Rome, Tevere river water was used for drinking and the waste water was discharged into the Tevere river through a highly developed sewer system. Around this time, toilets were decorated with mosaic and marble and the water from the tank was used.
- B.C. 33 There were 170 public baths in Europe alone and later their number increased to as many as 1,000. At this time, owners of the houses facing the road were responsible for cleaning them and Caesar made people clean roads periodically after they had been paved. It is believed tall buildings had no water supply and drainage facilities beyond the second floor. Therefore, excrement was thrown on to the road. Plinius (Gaius. P. Secundus) in "Historia Naturalis" describes the use of manure. He also emphasized the medicinal value of urine. Life of Maththaios in the New Testment", reads - "You fellows still do not realize. Whatever you eat, goes into the toilet through your stomach". Here toilet implies the chimney type pot called "draught".
- A.D. 69 Vespasianus (Otto Empire) levied tax on toilets. In a fort belonging to the Roman era, there was a common toilet that could be used by 20 persons at a time and had a deep sewer drain. And it is believed that people used a sponge bar to clean themselves in place of

- paper. Water was supplied from a stone tank in which rain water was collected.
- 222 A.D. Roman Emperor Heliogabab was assassinated inside the toilet.
- 315 A.D. Most of 144-odd public toilets in Rome had WC. Those which were located in an open ground were divided into two portions and toilets were constructed on three sides of the main structure and there was a drain underneath. It was basically similar to that in Pompeii, ancient city near Naples in Italy. In North Africa, there were 26 toilets near the market. Seats were made of marble and there were holes and a drain underneath. On both sides of the seat were arm rests in the shape of dolphin and there was a wash-basin made of marble.
- 395 A.D. Roman empire splits into east and west. Exodus of people that started from 372 AD, resulted in WC of Rome being practically forgotten. And, people returned to primitive style of toilets used in rural areas earlier.
- 960 A.D. The Father Superior of Abindon (town in Oxfordshire, England) constructed a sewer-line connecting the abbey with the river. This was the first recorded sewer in England since the Rome age.
- 1088 AD Toilets in Lochester Fort were constructed in the castle wall and the human waste fell on the outer side of the wall through a hole. In Cambridge, the human waste was collected on the road and then cartloads of waste were taken to be dumped outside the city. In Strasbourg, dumping of human waste or garbage in front of residential houses was prohibited by law and it was obligatory to collect them in a specified place near the meat or horse market.
- 1160 AD In Saleruno in Napoli (Italy), Aruso writes a book on the method of urine test, based on Arabaian medicine. He classified the urine of patients into 19 types depending on its color, quantity, sediments, etc. (Uruso's "A manual of Urinology"). The most important feature of the technical history of Europe, as represented by Canterbury Abbey, was that all the Abbeys in the medieval age functioned as a small independent city and had almost complete water supply and drainage facilities. In the Durham Alley, there was an independent toilet next to the Abby. In the pit found in the monastery

at Saint Alvanse Cathedral, purgative (laxative) and pieces of gown used for cleaning by clergymen were found. In the Fountain Alley in Yorkshire, there were nine toilets covered with nine archs.

- 1200 AD In Paris, Phillippe August orders the construction of paved roads in the city and the drains by the roadside. It marked the beginning of sewer network in Paris. Viore Lu Duke: Toilets in the castle were located in the internal angle of the main castle of support wall and were so devised that the human waste fell outside the castle. In the Landsberg castle, toilets were surrounded by rectangular walls extending out from the castle wall, with provision of human waste to fall beneath. (Such toilets were mostly found in castle that had barracks. i.e. France, Poitiers State, England, Langre Castle, Marknosis castle etc.)
- 1214 AD In Strasbourg, breeding of pigs in the open was banned. Although they ate up human waste, they dirtied the environment too. Since there were no toilets in the houses till the 14th century, public toilets were constructed and were manned by scavengers. However, with the increase in the population, public toilets became insufficient. Hence, people excreted in the stools and threw the contents into drains or rivers. And in Edinburg, citizens threw the human waste onto the roads like in Paris. Henry III ordered the construction of drain pipe between Westminster Palace which had the underground sewer system, and the Thames river so that waste from the kitchen could be discharged into the river directly. In the Green Castle, in Country Town to the north of Ireland, there was waste-drop-type toilet constructed on the castle wall.
- 1271 AD In Marco Polo's "11 Million", there is an account of toilets in the Gobi desert.
- 1290 AD Clergymen in Southern Buton are permitted to have water supply from the reservoir and in 1310, citizens also started getting the supply. In France in the Pierefon Castle, there were privies where waste fell into a bucket and there was an outlet to collect the waste and a window to release the foul smell.
- 1310-14AD In the account of Sharivari, it is mentioned that human

waste was thrown at passerbys at the time of Carnival, as a ceremony.

- 1318 AD Joanes Mactoarior published his 7th volume of "Urine Research" in which he considered urine as the filtrate of blood. During the reign of Edward I, in Pemasaris castle in North Wells, human waste was being thrown down through a square shaped chimney extending out from the wall. Outdoor toilet was called privy and big ones meant for castles or large houses were called guardrobe (wardrobe implied the portion next to the privy for keeping clothes). But it was Edward II who got locked up in this guardrobe. James I was killed there. Toilets were the places where many conspiracies were hatched. Around this time in most of the cities, garbage and human waste were being thrown on the roads.
- 1338 AD Glass makers offered 432 bedpans in the form of tax to Wien Prince Funbelt II.
- 1513 AD An edict in Paris made it mandatory for constructing a urinal in each house but it could not be implemented. Therefore, space of a house between two houses was left vacant for this purpose. At the time of religious reform, books from the Alley were used as toilet paper.
- 1519 AD In Mormandie, the high court orders the construction of toilets on the roof top of each house.
- 1533 AD Paris High Court orders the construction of a regular manure Vat in each house and another edict in 1539 strictly enforced the same.
- 1534 AD Francois Rapre' in the 13th Chapter of his book "Tale of Gargantua and Pantagrielle" talks of the queer custom among Italians of using a gosling to clean themselves after evacuating. It also describes the throwing of urine at one another in the carnivals. This book closes with a song, talking of human waste.
- 1544 AD Poet Woostroque-de-Bolyu who was known for his poems on human waste; he was very famous.
- 1546 AD A Purveyor to the government in London, supplied an expensive toilet bowl (stool) to the Royal Family. (Purveyor was Royal Coffer Mayors).

HENRY VIII TOILET

Toilet used by Henry VIII during travelling was covered

with black velvet laced with ribbons and 2,000 gold plated rivets, some filled with water.

QUEEN ELIZABETH TOILET

The toilet used by Queen Elizabeth and James I had cushion and lace decorations with a pot inside the toilet bowl (stool). King James V of Scotland used 15.5 yards of cloth for partitioning. (The cost of cloth worked out to 52 pounds 2 shillings in those days.) Henry II tries to measure the amount of waste in the Paris sewer but failed. No such attempt was made until 1760. Sewer also became the hiding ground for criminals.

1566 AD Humanist Henry Ethienu criticises the Gothic style architects for constructing the toilets in the most prominent place of the house.

1571 AD Philosopher John Louis Vivesse refers to families housing the toilets at the roof-top due to foul odor and using buckets (pots) inside but soon toilets began to be located across the courtyard.

DRY PRIVY 16TH CENTURY

In the 16th century England, there was dry privy, (also called earth closet) where after defecating, soil (sand) was put on the waste. It was only in the latter half of the 19th century that dropping of sand was automatized

1585 AD In Bordeaux, construction of toilets and manure vats inside the houses is ordered and throwing of human waste and garbage on roads is banned.

INVENTION OF WC

1596 AD John Harrington invents WC. He describes the WC he had in his own house in one of his poems. Further, he constructed similar WC for Elizabeth to be used in Richmond Palace.

1600 AD Velvet covered toilet seat for the British Monarch to be used during travelling is invented.

KING GIVES AUDIENCE WHILE USING TOILET

Louis XIII gave audience while using his toilet. Louis XIV too did the same. Further, there was an exclusive cleaning object for each member of the royal family. Different things were used for cleaning after use such

as linen, merino, thread waste, leaves, small stones, pages from books etc.

- 1606 AD Henry IV banned the soiling of Louvre with human waste. Offenders were fined. First-ever sewer main line was laid in Paris.

MEDICINAL VALUES OF URINE

Urine has been said to have medicinal value since ancient time and the same is further stressed during this period. A Minister of Louis XIII ate horses' dung mixing with white wine. And in the 18th century, Doctor Foshall used urine for gargling. Toilets in the houses were on roof top and manure vats were constructed outside.

- 1609 AD In Paris, septic tank was cleaned by providing for sewer and water sprinkling facilities and water was discharged into Seine River.

ABANDONMENT OF CARRYING NIGHT-SOIL IN BUCKETS

- 1609 AD Practice of physically transporting the night-soil in buckets was abandoned and in Hamburg and Berlin sewer line was laid.

- 1609-13AD During this period, some interesting episodes took place. In the box of a theatre, Marchioness Raphelt eased herself and unable to bear the foul smell, threw the stool down the parquet; Louis Anjerik suffered from incontinence due to overlaughing; Ms. Orlean had special liking for faecal matter etc.

BUDAAL TOILET BOWL-FRANCE

Budaal, a member of Jesus Society and confession priest for females of the Royal family, was regarded as a symbol of good luck and, thus, they named the toilet bowl after him.

- 1624 AD As in the previous century, toilets were equipped with a ventilator or vent hole to release foul smell. And Francoise Blondel in his "lectures on Architecture" emphasised that the toilets should be connected with manure vat away from the house with a fired pipe and this manure vat should be further connected with drain (sewer) for waste water or rain water. However, in the countryside, manure vats were not common, and some

- people climbed up higher places to evacuate themselves.
- 1625 AD In Hampton court, there is a cross stool covered with red velvet and is believed to have been used by Charles I and James II.
- 1641 AD In Berlin, construction of pig sheds by the roadside is prohibited. Such laws enacted in each city in Germany one after another since early 15th century. Pigs were let loose in the cities to eat up the garbage and human waste till the 19th century.

TOILETS AT VERSAILLES PALACE : 1641 AD

- In the Versailles Palace (near Paris), there was a luxurious commode type toilet having back rest and attached container for personal effects. Structurally, this toilet was a chamber pot. In the list of properties of the palace, there is a record of 274 toilets. Among them, 208 simply had a container underneath and 66 were gorgeous ones with lots of decorations. Due to soiling of Paris city by human waste, Louis XIV is requested to construct toilets all over the city.
- 1665 AD Epidemic breaks out in London and many laws are enacted to prevent soiling of roads or throwing of things that caused foul odour. (60,000 persons die of pest)
- 1666 AD There is a big fire in London and here after night-soil is collected at night and sold to farmers in the neighbourhood.

WEARING OF OVERSHOES BY LADIES AND WASTE DISPOSAL

- As depicted in a poem by Swift, in London, human waste in drains and rivers was often thrown onto the roads due to flooding caused by rain water. For that very reason, ladies of rank wore overshoes. A German doctor Christian Fratz Paulini published a book in Latin entitled "Pharmacy of Stool". In Paris, sewer was 10 km. long, of which 8 km. was open and therefore, dirty water was getting discharged into Seine river. And, 100 years later, its length extended to 26 km.
- 1668 AD A Minister of the Chatoure Empire reports that since there were hardly any drains and toilets, there was intense foul smell all over. In Paris, Police Commissioner Nichola-de-Ralen, orders the construction of toilets in all houses.

- 1670 AD In Paris, carriers of night-soil begin leaving the jobs due to low salaries and also to enable their children taking up some better professions.

TOILET OF THE QUEEN OF HAM HOUSE

- 1675 AD Next to the bed room of the Queen of Ham House, there was a "cross stool" in the closet room but lacquered one's were also being used by the Royal family.
- 1676 AD Ceramist Yan Ariance Fan Ham sets up a kiln in the box hole and the manufacture of English Derft starts. In rural England, toilets for simultaneous use by 3 to 6 persons were constructed in the gardens.

JOB RESERVATION FOR SCAVENGERS

- 1696 AD The Paris High Court prescribes the job skill for night-soil carriers and prohibited people from other professions to do it.

LOUIS XIV TOILET

- 1676 AD It is reported that Louis XIV used the British-style toilet connected with overhead tank and manure vat.
- 1679 AD In England, Chamber pot continues to be used till the 18th century.
- 1700 AD In Paris, all private houses are ordered to construct urinals within one month or face eviction. A seat type toilet is constructed which from its appearance looks like stacked books.

WATER CLOSET-WINDSOR PALACE

- 1700 AD There was water closet in the Windsor Palace during the reign of Queen Anne. In France, WC was called "British Style Angrez"

ENGLISH WC

- 1700 AD According to Heyer, WC in England at this time so devised that water was filled first and after having used it, Spigot was opened to discharge the contents outside via the drain pipe.
- 1700 AD According to Vole. Le. Duke, in the Versailles palace, seat called "Gardor" was used till the 18th century. (One used by Louis XIV was lacquered and had a Japanese landscape painted on it.)

- 1700 AD Chamber pot in the shape of pitcher is used in France by ladies from around this time. Mostly it was made from ceramic ware.
- 1705-10AD Eleven edicts are passed in quick succession banning unauthorized dropping of night-soil.
- 1710 AD In Versailles palace, bidet makes its appearance.
- 1713 AD Nichola-de-Maal reports in "The Outline" that there are no public toilets in France.
- 1718 AD In England, B.S. Francis uses WC. In it through the use of balance, fixed amount of water is collected and discharged.
- 1722 AD In Paris there were three appointed placed for throwing waste and dead bodies. Throwing of waste into the Seine river was banned through an imperial edict.
- 1726 AD John Howard, the pioneer of prison conditions improvement movement in London, denounced the fact that there were no common toilets and prisoners used sewer for this purpose.
- 1728 AD Louis XV constructed new style bathroom in the Versailles palace.

ATTACHED TOILET

- 1737 AD Architect J.F. Brondel described the ideal toilet as one which was next to the bed room, which had covered seat and the whole thing was hidden in a long seat connected with the wall. Initially, the cover was springboard type but soon it became automatic which could be lifted through the pressing of a button (Paris).
- 1738 AD Since homosexuals came closer to each other pretending to be urinating, police patrolling was very strict near Deauriui Palace and San Tantvaneau Gate (Paris). Officials in Paris kept barrels for people to evacuate themselves at several places on the roadside. Around this time, urinal pot and toilet bowl were in use in every house.

FIRST SEPARATE FRENCH TOILET FOR MEN & WOMEN

- 1739 AD At a ball in Paris, for the first time, separate toilets for men and women are made.
- 1740 AD Tyurgo constructed the trunk sewer line called santur in which there was a 6000 sq. m. storage tank of purification and there were a large number of branch

sewer lines constructed under the roads in a highly organized manner. With this, the blind sewer system came to its end in Paris.

DISCARDING OF CHAMBER POT BY LADIES

- 1745 AD Poet Swift writes about the maid servants discarding the chamber pot of womenfolk. Further before 1729, he constructed WC for himself. A number of furniture companies started manufacturing night table for keeping the chamber pot, toilet stand for keeping commode, etc.
- 1749 AD At the unveiling ceremony of copper statute of Louise XV, 48 night pots are laid out. Louis XVI and Marie Antoinette used the latest style water closet where stool was made of marble with lifting cover, pipes for flushing the waste and for cleaning the buttock.
- 1767 AD John Crunden writes that of the 46 houses, only 5 had WC (London).

CONSTRUCTION OF PAID TOILETS

- 1771 AD Baron Angivirel, Director of Buildings and Parks Management Bureau, ordered the construction of paid toilets. Twelve paid toilets were constructed where paper was provided free.
- 1774 AD The job of burial of mortal remains of Louis XV was carried out by scavengers of Versailles Palace. In most houses, since the barrels filled with waste were buried in the lawn or kept in the basement, their influence on the surroundings was big, especially on stored wine and well water.
- 1775 AD Alexander Cummings, a watch-maker of London, registered his patent for making WC for the first time in England. It was siphon type and since there was always water in the pit, there no foul odour. Drain pipe was U-shaped but valve was not perfect.

SECOND PATENT FOR WC

- 1777 AD Second registered patent was invented by Thomas Proccer that suppressed the foul odor completely. It was an improvement on Cummings WC and through the circular cock, water level could be regulated. When the

lever was pulled, waste was flushed. It was called "pan closet". However, its drawbacks were that the sound of pan revolution was big and its cleaning power was less.

CONSTITUTION OF COMMITTEE FOR SCAVENGER WELFARE IN FRANCE

1777 AD Louis XVI constituted a committee to investigate air pollution and also expressed concern for protection of scavengers' health.

JOSEPH BLUMER, JAMES GREASE

1778 AD Furniture dealer Joseph Blumer invented the WC where two hinges were provided at the bottom of the pot. In this, crank valve was used in place of slide valve. In the same year, James Grease and others registered new patents one after another.

1783 AD David Lease registers his patent.

1786 AD Architect Jillow proposed moving-type manure Vat. It had provision for a tank that could be moved to the basement (Paris).

1789 AD Thomas Launtry registered his patent. Six WCs are constructed in Shellboon House in Barkley Square. Through the pull of handle, waste could be flushed.

1791 AD Paris sewer-line is extended to 26.5 km.

AUTO WC - JOHN ATHLAY

1792 AD John Athley registered his auto. WC In this water was supplied automatically the moment a person sat on it.

THOMAS BIN'S PATENT FOR WC

1793 AD Carpenter Thomas Bin registered his WC having valve.

WILLIAM INVENTS IMPROVED MODEL

1806 AD According to Victor Yugo, in the 2nd year of Napoleon rule, the total length of sewer-line was 23.2 k.m. but thereafter, Napoleon constructed 4.8 km., Louis XVIII 5.7 km., Chartles X 18.0 km., Louis Phillipe 89 km., and Republican Government 23.4 km. and by 1862 its total length became 227 km.

1809 AD Napoleon I, through an edict, ordered due consideration to be given to the health of scavengers.

- 1812 AD Public Health Supervision Bureau is instituted (Paris).
 1815 AD In London, excrements are flushed into the sewer for the first time (Till this time, sewer was used for rain water and drain water.) Laying of water-transportation sewer is commenced.
 1817 AD In a Paris guidebook, all luxurious paid toilets are recorded.
 1824 AD Sanitation Deucibele reports that 35628m of sewer line based on arch method of construction is under construction in Paris. He reports that a further 2206m is open sewer and at some places it is manure Vat like and is unhygienic.

FIRST PUBLIC TOILET IN PARIS

- 1830 AD In Paris, first public toilet was constructed by the Senie Governor Ranpyuteau in the Italian Street. This toilet, made with stones and plaster, became the barricade during July Revolution. In place of dipping in a bucket, suction and push pump were employed and 1000 litres of night soil could be treated in 6 minutes.

PUBLIC SANITATION LAW

- 1842 AD Edwin Chadwick submits the public sanitation Law before the Parliament.
 1843 AD In London, sewer committee is formed and over 2,00,000 manure vats in slum areas are eliminated. And the work for connecting WC with sewage system is started. Friedrich Angles writes a report about the unhygienic living conditions of labour districts in London and other British cities. He writes that there were inadequate drainage facilities and toilets. Human waste etc. was being thrown into the drains (i.e. Edinburgh). Roads in Leeds are strewn with human waste and in Butterfield, waste fermented and dirty water gathered all over the place. There are 468 public urinals in Paris. While Lyon had sufficient number of urinals, Lille had none till the middle of the 19th century. Sociologist Alexander played an important role in the improvement of public sanitation such as survey of sewer, closing of Monfokon dumping ground, formation of rescue teams during 1832 cholera epidemic, etc. "Paris city News" often lamented the fact that Paris citizens not only urinated in the

open but often defecated too.

PORTABLE CLOSET

1844 AD Vess invents the portable closet having a bowl and a small water tank.

HALF DOORS IN TOILETS

1846 AD In the imperial school in Lyon, half door was put in the toilets to prevent students from masturbating.

In Berlin, urinals were constructed in a corner on the staircase or footpace and night-soil was dipped up every second day.

1846 AD Sanitation law in Britain - (1847)

1847 AD Sewage work is completed in London. Southwood Smith launches a campaign for environmental sanitation. And subsequently public sanitation law is enacted.

1848 AD Cholera breaks out in summer in London and in September in one day 200-400 persons die.

TOILET IN A HOUSE IS MADE OBLIGATORY

New public sanitation law is enacted in England. Construction of ash-pit or WC in each house is made obligatory. Further, sewage Management Committee is constituted in London and open drains are covered.

1849 AD Number of deaths due to cholera in London was 14,000 annually. In 1854 the number reduced to 1,000 and in 1870 it became nil. At this time, residents of Phillimore region had complete sewage facility

1851 AD John Jennings who played the keyrole in the improvement of public sanitation conditions in London, developed the new "key closet" and became very popular. In the London Expo, which displayed it, 827,280 persons used it paying in cash.

EXCLUSIVE RIGHT FOR DIPPING OF NIGHT SOIL TO RISHH Co.

1852 AD Napoleon III gave monopoly to Rishh Co. which had 7 branches and 300 employees, for dipping operation of night-soil.

1854 AD Through an edict, draining of human waste into the sewer was permitted (Paris).

PREFERENCE FOR SAND TOILET

At this time, as epidemics broke out due to sewage

treatment, doctors and sanitarians preferred sand toilet used since olden days.

TOILETS AS PART OF COOPERATIVE HOUSING

In Napoleonic Cooperative Housing, the first public welfare housing block in Paris, four toilets were constructed on either ends of each floor and on an average there was one toilet for 4-5 families.

COMMERCIAL PRODUCTION OF TOILETS

1857 AD Daniel Bostal Co. of Britain successfully manufactured the "wash out closet" on commercial basis.

INVENTION OF EARTH CLOSET

Clergyman Moore invents the improved model of earth closet (automatic type). Since the human waste was dried in this system, foul odour was suppressed considerably.

1859 AD Toilet for Queen Victoria in North Western Railways had a valvet system and was decorated with gold and turquoise.

1863 AD Sanitation Committee for Private and Public Schools in Paris in its report, stated that 62 per cent (855 schools) of the 1,403 schools did not have adequate toilet facilities.

SEWAGE WATER AS MANURE

1869 AD As an experiment, sewage water is used as manure in 6 hectare of land and from the grass grown there, it is confirmed that use of manure causes no problems. Water pipeline is laid in Danchihil in Germany.

1870 AD Louis Mooler discovers in Paris that the solid portion in human waste if liquefied, dissolves in manure vat. He developed the method of sealing of the vat but since he caused typhoid; it was abandoned.

INVENTION OF SIPHON TYPE TOILET

J.R. Man develops the siphon type closet.

DEVELOPMENT OF WASHOUT TOILET

1870 AD T.W. Tuisford develops wash-out closet where water is always there in the closet (pit). S.S. Hellier invented

- "Options" which was an improvement over Blumer model. It was the modern toilet used widely during the second world war. J.R. Man developed "siphonic closet" where sand with water flowed through S-shaped pipe, based on the principle of siphon. However, it was a complicated system and since its washing capacity was poor, the "wash-down" system became more popular.
- 1872 AD Paris Municipal Council gave the jurisdiction of 6 independent toilets to Dorion.

FIRST CERAMIC TOILET

- 1876 AD Paris Sanitation Science Society and Occupational Sanitation Society are formed. A movement is launched to educate children about cleanliness and to improve toilet facilities in schools.
- 1878 AD By this year, the total length of sewerage in Paris was 600 km.
- 1880 AD Around this time, more than the mechanical toilet (where water was radiated in the stool itself) it was the non-mechanical (there is only a hole for discharging water in the stool and the water discharge mechanism is in the cistern tank) toilet which became popular till about 1914. Hereafter, more attention was given to decoration of the stool, and it marked the advent of the so-called closet-art era, some had flower design, some had Lion or Dolphin shape and even some were all Nouveau style.
- 1881 AD John Louis Mooras applied for patenting of a new automatic, odourless night-soil tank. Priest Muwanio of the Jesus Society, in collaboration with Balba Co., manufactured this waste water tank on commercial basis which could serve 10 persons at a time. (Paris)
- 1882 AD Paris city permitted the installation of Mooras type waste water tank in individuals house. Ministry of Education (France) decided to have two toilets for each class of male students and three for each class of female students and separate toilets for teachers. In Paris, out of 71,873 buildings, housing 60,000 families, 30,000 did not have water supply facilities.
- 1883 AD Emile Lither invented oil urinal, i.e. where city substance was used in place of water to smoothen the surface of slate or cement (France).

ANOTHER TOILET FOR QUEEN VICTORIA

- 1883 AD Thomas Turiford made a wash out toilet" called "Unitas" made fully from ceramic for Queen Victoria. It was the most beautiful toilet ever made and was on sale in 1901. Toilet installed in Manjour Secondary School in Paris became the focus of all attention as the most ideal toilet for schools. On the proposal of sanitary housing Committee, a new law was passed regarding fully furnished rental rooms, which made provision for having a toilet for every 20 persons (Paris).
- 1886 AD Felix Mandini's Company constructed thousands of low-rent apartments in Lyon and they were all equipped with WCs.
- 1889 AD Paris Municipal Council officially approved the purification and use of sewage water based on agricultural treatment. Sewage Treatment for the First Time in the World.
- 1889 AD In London, sewage treatment is started for the first time in the world.

SEPTIC TANK

- 1904 AD Arbeis Carmett Trail manufactures two septic tanks (Paris).
- 1905 AD A company specilising in construction of underground toilets, opens one such big toilet having facilities for 22 urinals for men, 3 ceramic WCs, 14 WCs for women and 4 make-up rooms, in Madeleine Square beneath the flower market.
- 1906 AD In the Debenham Palace constructed in London by Harzei. Reculd, there was a ceramic enameled scat type toilet in the marbeled bath room designed by William de Magan.
- 1907 AD Off the 616 cities having a population over 5000,294 did not have adequate sewage facilities. Engineer Jule Armango proposed the construction of all underground urinals (Paris).

LADIES TOILET

- 1908 AD In Hallows, London, a gorgeous ladies toilet decorated with stained glass, marble and mirrors is constructed. In London, as an extension of club culture, many male urinals were set up.

- 1910 AD On the sandwich beach of KENT, a bath-tub which had supply of hot sea water and cold fresh water is made for Lady Aster. The length of closed waterway network for supply of water to Paris, becomes 517 km. Hence, while 36,50 did not have drainage facility and mostly labourers lived in such houses, in Seine district, use of unapproved sewage purification tanks was banned.
- 1911 AD Member of Municipal council Adrof Sherew reports that in Paris besides, 112 independent public toilets there were 806 urinals for 2-3 persons each set up by advertising companies, 398 urinals for 2 persons each set up by Paris Municipal authorities and 415 urinals for each person.
- 1914 AD Seine district Governor orders dipping up of manure vat from each house under the martial law. In Manchester, use of bacteria from sewage treatment is discovered.
- 1920-22AD A survey by the city Public Sanitation Research Institute revealed that out of 2,000 sewage purification tanks in use, only 12 were as per technical standards and only two performed the purification job correctly. In London, three bacteria methods including contact filtration, active sludge methods etc. are tried for sewage treatment in the down stream of the Thames river.
- 1928 AD In London, sewage treatment facility employing active sludge method is set up.
- 1930 AD From around this time, agricultural land for reduction of the sewer became scarce and construction of sewage treatment plants became problem in France. As a part of water purification plan of Seine district, it was decided to connect three new waterways for waste and rain water with the existing Aseru plant.
- 1930 AD Urinals, that were set up in very large number from around this time, were dismantled.
- 1937 AD In the Paris Expo, Sanitation Hall is set up.
- 1239 AD Till this year, contrary to the trend in the countries, trains in France did not have WC. During two great wars WC made of white ceramic and equipped with seats made of mahogany of oak become popular in France.

- 1959 AD Paris Municipal Council decides to abandon all the surface toilets.
- 1960 AD 130 urinals are dismantled (Paris).
- 1980 AD Paris Municipal council permitted the installation of three sunnyzet (auto-control public toilet). Thereafter, 150 in 1981, 150 in 1982, 100 in 1983 have been constructed and the number has risen gradually ever since. This, in brief, is the history of the evolution of toilet systems. Now, the WC and the sewerage system are the accepted practice all over the world. But, most Third World cities are not fully sewered because of the high-cost, as a result of which a variety of toilet systems have come into use. But the Sulabh toilet system is most effective of them all for non-sewered areas. The history of toilets also shows that there has been a constant search for the methods of human waste disposal. And, that search is not yet over because the costly sewerage system is not possible for the poor countries. Besides, our rivers have no more sewage carrying capacity, thanks of rapidly rising population and slums. For that reason also, the on-site, Sulabh excreta disposal system becomes a viable alternative. ●

(Source: *"Sulabh Museum of Toilets"*, New Delhi).

For want of toilets, battles were lost

In a survey conducted recently by *Focus* magazine on March 1997 (as by William Harston in the *Independent*, London), toilet was found to be the greatest invention of modern times, more important than fire, the wheel, steam power, microwave, computer and, *lo and behold*, atomic weapons!! Toilet topped the list of all inventions in the survey conducted by 1,000 researchers, science writers and members of the public. Disposable nappies (in 95th place) would probably have earned more votes had it not been for contraception (in 12th). Computers, in second place, have pushed the printing press down to third, but the overall winner was "*the toilet system*".

Now there can be little doubt that proper sewerage system, drainage and lavatory paper have been responsible for greater improvements in the quality of life than anything else one can name. Describing "*the toilet system*", as the single most important invention,

suggests how times have changed.

The Chinese had primitive flush lavatory 4,000 years ago; the first modern water closet was invented by Sir John Harington in 1596, yet nobody could have considered "*the toilet system*" worthy of first place in the roll of man's ingenuity before Mr. A. Ashwell of Herne Hill patented the *Vacant/Engaged*



The sewerage system was introduced in India in 1870 but still it has covered only about 300 towns, out of 4800, and that too partially

sign in 1883!! Surely, Dome Perignon's invention of the cork, which aided the secondary fermentation needed to produce the fizz in bubbly, is worth mentioning. As stated earlier, instant coffee squeezed in at 100 place while teabags are absent? There is no arguing with *Da Vinci's* genius in inventing scissors (72), but we see no mention of Issac Newton's greatest contribution of all: the cat flat. And can anyone really claim that the brassiere (88) has done more for civilisation than the wet T-Shirt? Taken altogether, this compilation of the "100 Greatest Inventions" is seen as the best achievements of mankind. Toilet tops it all!

To be true, toilet has always been a critical area of man's concern. Cynic historians say that Pompey the Great (106-48) lost the war on the bank of the Rubicon, the mythical river that once divided Rome from Cisalpine Gaul (France), to Ceasar not because of the "cackle of the geese" that woke up the sleeping Roman army but because Pompey's army had diarrhoea which had made them too weak to fight Roman soldiers. The Greeks lost the Peeloponnesian War (378 AD) to Sparta because the huge Greek army had no place for toilet and cholera broke out, creating panic and causing defeat after which Greeks could never recover again.

As long as man did not have an established home, he did not have a toilet. He excreted wherever he felt like doing so. When he learnt to have a fixed house, he moved toilet to courtyard and then within his home. Once this was done, it became a challenge to deal with the smell and the need was felt to have a toilet which can intake human wastes and dispose them of out of the house instantly and, thus, help maintain cleanliness. Man tried various ways to do so, i.e. chamber pots, which were cleaned manually by the servants or slaves; toilets protruding out of top floor of the house or the castle and disposal of wastes into the river below, or common toilets with holes on the top and flowing river or stream below. While the rich used luxurious toilet chairs or cross-stools, the poor defecated along roads, in the jungles or straight into the river. It was only in the 16th century that a technological breakthrough came about which helped the human beings have a clean toilet in the house.

Sitting type toilets in human history appeared quite early. In the remains of Harrappa civilisation in India, at a place called Lothar (62 km from Ahmedabad) and in 2500 BC, the people had water-borne toilets in each house which was linked with drains covered with burnt clay bricks. To facilitate operation



Sulabh toilets are most needed in slums where people have none to go to

and maintenance, it has what we call today man-hole covers and inspection chambers, etc. It was the finest form of sanitary engineering. But with the decline of Indus Valley Civilisation, the science of sanitary engineering disappeared from India. From then on, the toilets in India remained primitive and open defecation became a common practice. The archaeological excavations confirm existence of sitting type toilets in Egypt (2100 BC). Though we have been able to mechanise the working of these toilets, the form and basic format of the toilet system remains unchanged.

In Rome also, public bath-cum-toilets were well developed. There were holes in the floor and water was flowing beneath. When the Roman travelled, they constructed the toilets for their use. The stools were key-hole type so that these could be used for defecation as well as urination. Excavations in Sri Lanka and Thailand too have brought out a contraption in which urine was separated and allowed to flow while the other portion was used at the same time for defecation. Historical evidence exists that Greeks relieved themselves out of house. There was no shyness in use of toilet. It was frequent to see at dinner parties in Rome slaves bringing in urine pots made of silver. Members of the royalty defecated and played at the same

time. This practice of covering waste with earth in India continued till the Mughal era. The period between 500 and 1500 AD was a dark age from the point of view of hygiene. It was an era of cess-pools and human excreta all around. Rich man's houses and forts in India had extended part from which defecation was done and the excrements fell into the open ground or the river below. The forts of Jaiselmer in India and big houses on the banks of rivers bear testimony to this fact. In Europe, it was an era of chamber pots, cess-pools and cross-stools.

Based on this rudimentary information, one can say that development in civilisation, sanitation systems have been co-terminus. The more developed a society, the more sanitized it was and vice versa. Toilet is part of history of human hygiene which is a critical chapter in the history of human civilisation. Toilet has a critical link between order and disorder, between good and bad environment. India is faced with the formidable task of cleaning 900 million litres of urine and 135 million kg. of faecal matter per day with totally inadequate system of their collection and disposal. As many as 700 out of 950 million people in India do open defecation. Sewerage facilities are available to not more than 30 per cent of population in urban areas and only three per cent of rural population has access to pour flush latrines.

The excreta related diseases had great past and, unfortunately, great "future" in the Third World countries where they are major killers. These diseases killed those who could not be conquered in the battlefield. The excreta related enteric diseases, as underlined earlier, are invidious invaders which quietly upset the body mechanism and destroy men and nations without anybody knowing much about them. Poverty and backwardness of the countries, mostly in the tropical and desert zones of Africa and Asia, suffer badly from these sanitation-related diseases which incapacitate man, diminish his ability to think and work, resulting in low productivity, and, finally, in grinding poverty as is reflected in defeat and destitution of civilization. ●

"Man is rushing to the moon, quite forgetting that the earth is quite the place they should worry about.

- Al Gore

Mars mania grips 'toiletless' world



Sojourner on Mars



Toilet in home

Man has reached the Moon, landed remote-controlled instruments on Mars and on planets farther away, compressed knowledge spanning several centuries onto a tiny chip, cracked genetic codes and cloned life. Yet for all impressive achievements, half the world's people have no access to a toilet or a decent latrine and must, therefore, remain susceptible to epidemics like cholera and other water-borne diseases. What is worse, the numbers of those denied sanitation facilities have increased from 2.6 billion in 1990 to 2.9 billion in 1996.

Highlighting the absence of rudimentary sanitation facilities in half the world, a UNICEF report has pointed out that about 2.2 million children die annually of diseases caused by unhygienic conditions. An

issue is waste matter contaminating water supplies, polluting open areas and breeding vermin. The report has said and underlined that the problem is most acute in rural areas where only 18 per cent of the people worldwide have access to a toilet or a latrine. In urban areas of developing countries, over 37 per cent lack such facilities. And even there, according to country reports, Uganda, for example, claims adequate sanitation in about 80 per cent of households, but the figure shrinks to just three per cent if pit latrines are excluded. Considering that the cost of providing adequate toilet or latrines ranges from five to 60 dollars, the UN agency estimates that the problem can

be solved in ten years if an amount equal to ten per cent of an year's global military spending is set aside for toilet construction programmes.

But as WHO's rural health chief Dennis Warner notes, sanitation is not a sexy issue and governments either do not have a political commitment or do not like to provide services to 'squatters'. They hope the problem will go away, but it doesn't; and lack of funds only aggravates it further. Most pertinently, the UNICEF report points out that, the World Bank-IMF inspired structural adjustment programmes have forced several development nations to cut basic services like sanitation construction. ●

When plague ravaged Europe

Thucydides, a Greek historian, was the first person to describe plague in 431-404 BC. In the 6th century AD, the disease spread from Africa to the Byzantine Empire claiming many lives for 50 years and became known as the plague of the Justinian Era, when "...entire cities were depopulated. The land looked a desert, men's dwelling were taken over by wild animals (Popovsky M., *Story of Hoffkine*)."

This was the first recorded evidence of the association of rats with plague. Between 1347 and 1350, the disease occurred in several parts of Europe and spread via the numerous land routes to Africa and Asia. Millions died in this epidemic and the disease came to be called the Black Death. The disease recurred in 1665-66 and London was badly affected. Another worldwide plague epidemic began in 1894. From China the disease reached Bombay in 1896 and soon spread to other parts of the country. There are only two direct references to plague in the 14th and 15th centuries, in western regions of the country.

The Black Death struck Rome in 590 when people dropped dead even as they followed the Pope Gregory-I in procession to ask God to end their affliction. It defied people's efforts to prevent it from spreading. What came to be called the Black Death, perhaps because haemorrhaging created black splotches, took several forms, the commonest of these was *bubonic plague*, named from the buboes, or swellings, in groin and armpit. These were followed by vomiting, fever and death. Pneumonic plague affected the lungs, while septicaemia plague entered the blood and killed in a day.

The plague was probably brought to western Asia by traders from China bearing furs infected by plague-carrying fleas. In 1347, Crimean Tatars, themselves already ravaged by the plague, besieged Caffa, a port on the Crimean coast largely inhabited by Italian merchants. In an attempt to turn their affliction by plague to advantage, the Tatar chief, Janibeg, ordered his men to throw plague-ridden corpses over the city walls to infect the inhabitants.

The tactic brought results far beyond Janibeg's wild imagining. When the Italians in Caffa became infected, they fled home to Genoa, Messina and Venice, and in late 1347 and early 1348 these three cities became the first in Europe to feel the effects of the Black Death.

In Messina, the townspeople panicked, drove the infected sailors out, and fled. Not only did they fail to save themselves, but they spread the disease to other cities. In June 1348 the plague reached Paris. That same summer, it arrived in the ports of South-West England, probably imported by boat with a consignment of claret from Bordeaux. The plague descended on London early in 1349 and Scotland in December. Crossing the North Sea, it ravaged Scandinavia during 1350. From there, it moved south and east overland, until it came full circle, back to the homeland of the Tatars along the Volga river. By 1352, the worst was over.

Everywhere, the sudden appearance of the symptoms brought terror and misery. 'We see death coming into our midst like a black smoke.' Wrote a Welsh poet, Gethin, describing the sudden growth of the bubo. No one seemed safe: townspeople and country folk, rich and poor, were struck down. Half of Florence's 90,000 people died. Grave diggers, (or *becchini*), risked infection to collect and bury the corpses in exchange for the wealth of the dead, and payment from the living. As the plague destroyed normality and hope, the bonds of society started to unravel. The healthy fled the sick, parents abandoned children. Harvests went ungathered, livestock untended. Tens of thousands of villages were deserted as people fled the ravages of the plague.

A CONTINENT IN RUIN

Most towns did what they could, issuing decrees to control trade with infected areas. But as local leaders fell prey to the disease, law and order collapsed. In France, the Franciscan noted the death of 125,000 people. Villages were abandoned, and monasteries wiped out. Gherado, a monk in Montrieux, near Marseilles, who was the brother of the poet Petrarch, buried all his brothers one by one, until only he and a dog remained alive. In England, villages were left empty, decaying, and at last forgotten. In Rochester, the bishop's household lost 'four priests, five gentlemen, ten serving men, seven young clerks and six pages', leaving the bishop on his own in his palace. One of the most bizarre attempts to fight the Black Death came from a movement called the *Flagellants*. Its members swore to flog themselves three times a day for 33 days - one day for every year of Christ's life. In processions of up to 1,000, chanting, black-cowled figures arrived in a town, stripped to the waist, and allowed their leader to whip them. Then all started whipping themselves, singing hymns. Since they

were forbidden to wash, many died of their wounds. As the plague died away in western Europe, it left behind a continent in ruins. Estimates of the numbers of dead are vague - there were few records, and the impact varied from place to place. Across the continent, it is likely that 20-25 million, or about one in three of the population, died. Venice lost three quarters of its inhabitants and England approaching a million of its 4.5 million people. It was another 150 years before the population of the shattered continent was restored to its former level.

WHY DID PLAGUE ATTACK EUROPE SO VIOLENTLY ?

Throughout the 13th century, Europe had continued to benefit from a steady economic growth that had started around the year 1000. Assisted by a warmer climate and improved farming techniques, farmers brought in bumper harvests, and the population grew. By the middle of the 14th century some 70 million people inhabited the continent. One consequence of this was a growth in the size of Europe's urban populations. In the 11th century, few towns had more than 5000 people. But by the 14th century, Germany alone had 15 towns of more than 10,000 people, and several European cities had populations of more than 100,000. Congestion produced slums, filth and plague. Towns brought about social and cultural change, but also spawned a mass of practical problems. Beneath noble cathedrals huddled slums of abysmal squalor. In particular, the sewage and garbage in the unpaved streets provided ideal breeding grounds for rats and fleas. In spite of this economic growth, the continent was still heavily dependent on agriculture as a means of living, and poor harvests would result in a general decline in the country. Since the turn of the century the climate had worsened: colder winter and shorter summers had caused crop failures. This situation had been aggravated by wars - the Hundred Years' War between England and France had begun in 1337 - as soldiers had pillaged towns and destroyed the countryside. Frequent famines - one of Europe's worst struck between 1315 and 1318 - further lowered people's resistance to disease. And organised living came under stress.

SOCIAL EFFECTS OF THE PLAGUE

One major result of the Black Death, in Europe, was a sudden shortage of labourers. In England, one third of all farmland was left uncultivated.

Suddenly, the survivors of this social group found that they were in demand, and could command higher wages – and insist on reduced rents – from desperate landowners. This shift in the balance of power accelerated the breaking up of what came to be called feudalism, the system by which landowner and farm workers were linked by bonds of services and responsibility. The growth of towns had already begun to change this system, with the rise of specialised artisans and the development of a cash-based economy. After the plague, peasants gained increasing freedom from the lords from whom they worked.

Rulers struggled to stem the tide of change and attempted to enforce pre-plague wages by imposing fines and prison sentences. However, demands such as these led to a number of popular revolts. In 1358, the Jacquerie uprising in France resulted in 20,000 deaths. In England 23 years later, rebels led by Wat Tyler managed briefly to seize London. Faced with an incurable and explicable disease, many people turned to the Church, in the desperate hope that they might find salvation through prayer. In addition, thousands of wealthy plague victims left their estates to the Church, thus increasing its wealth. But not everyone, however, turned to Christianity for assistance. Some sceptics noted that the Church seemed powerless in the face of the plague, and that members of the clergy died as frequently as anyone else – or even more so, since good priests saw it as their duty to tend to victims. Even this sacrifice did not stop many people regarding the Church as corrupt and uncaring, and questioning its customs and values. Such discontent was a contributory factor in the movement towards more secular ideals that was to gather momentum in the centuries following the Black Death.

HOW DID PEOPLE FIGHT THE PLAGUE?

No one knew what caused the Black Death or how it spread, so doctors were unable to provide either a defence or a cure. However, there were those who, unwittingly, came close to finding a solution. Many believed that the air carried the infection. This belief, in the case of pneumonic plague, was not far from the truth – even if the cause was not as some suggested, a conjunction of planets. If indeed air carried the infection, people reasoned, isolation would ensure safety. It was not easy to apply this technique rigorously enough to exclude the real source of infection – the flea. However, in Sale, Morocco, a certain Ibn Abu Madyan did manage to do so, by walling

himself up and refusing to reopen his house until the plague had passed. The city authorities of Milan ordered the doors and windows of victims' houses to be walled up, leaving the people to die. This measure may have been the reason for the city's escape from the worst ravages of the plague. Soon after the Black Death, communities realised the benefit of isolation. In 1374, Venice banned travellers suspected of infection with the plague. In 1383, infected ships arriving at Marseilles were held for 40 days in 'quarantine' – from quaranta, Italian for 40. This only partially controlled the plague, as the original source of infection, insanitation rats and fleas went unattended.

WHEN DID THE PLAGUE RECUR?

The Black Death of the mid-14th century was not the first occasion that the plague had struck Europe and central Asia. A plague had occurred in the continent during the 6th century, and it may even have been the plague that attacked the Philistines in the 11th century BC, when, as a punishment for seizing the Ark of the Covenant from the Israelites, God 'smote the men of the city, both small and great, and they had emerods (haemorrhoids) in their secret parts'. Following the Black Death, there were numerous outbreaks, with a particularly vicious series in the 17th century. London suffered 35,000 deaths in 1625 and another 20,000 in 1665. In 1720, some 50,000 people died of plague in and around Marseilles. After that, Europe was spared, probably because the stone buildings, paved streets, improved sanitation and better hospitals that came into being as the continent's technology progressed served to keep the rats and fleas at bay.

However, less developed areas – Egypt, the Volga region, Rajputana (now Rajasthan) in India, and China – continued to suffer during the 19th century. A great epidemic in China in the 1890s, during which the plague bacterium was identified, spread to South America. There was even an outbreak in Florida in 1922. After this, medication and disinfection became increasingly effective in controlling and treating the plague. Several hundreds people still catch the disease every year, but deaths are numbered in dozens. Then the world realised that keeping places clean is not a luxury but necessary to keep off death – black or not so black.

The causes of the Black Death remained hidden until the 1890s, when in response to an outbreak in Hong Kong, a French scientist, Alexander Yersin, discovered the explanation. All forms of the Black Death are caused by bacteria called *Pasteurella pestis*, small numbers

of which are present in some wild rodents. The bacteria are spread by a rat flea *Xenopsylla cheopis* largely in conditions of bad sanitation. When a flea bites an animal carrying plague bacteria it becomes infected. The bacteria multiply and so clog the flea's digestive tract. As the flea can no longer swallow, it injects still-multiplying bacteria into the bloodstream of its host every time it bites. The rodents have some degree of immunity to the bacteria, but if they become heavily infected through the biting of the fleas, they die and the fleas having to find a new host. Pneumonic plague could spread more directly through droplets of blood and mucous, sprayed by the coughing of a sufferer, being inhaled by others. And by rats hidden in garbage heaps. ●

History of plague in India

Tracing the history of plague repeatedly brings out the highly infectious nature of the disease and its close association with unhygienic environment. J.K. Condan in his book, *The Bombay Plague, Being a History of the Progress of Plague in the Bombay Presidency from September, 1896 to June, 1899*, describes the diseases as '... obscure in its origin persistent in its duration, terrible in its effect'. This situation is no longer true today, since the disease-process is well understood and antibiotics can cure the disease.

Details about the disease of 1897 which struck Bombay first and then spread to the whole of India are well documented. The disease first appeared in the Mandvi ward. Labourers, dock workers and their family members were the first casualties, with high fever and lung infections as pronounced symptoms. The disease was ignored by the British for several months, despite high rates of mortality, presumably because they themselves were not affected. *The Times of India* of 28 September, 1896 writes '.....Bombay had never before been visited by plague... and this new development of insanitation should startle us into a new sanitary activity. The world will condemn us and our city for its sanitary sins.' Indeed, the source of the initial incidence of plague in the city was the filth of the sewers and the house gullies. Loss of several thousands of lives and criticism in Marathi and Gujarati newspapers, especially by Lokamanya Tilak, forced the British to take more urgent steps than just forceful segregation. They invited Dr. Waldemar Mordecai Haffkine to come to Bombay and find a possible cure or vaccine for plague. By then Haffkine had a formidable reputation and had successfully developed and tried out an anti-cholera vaccine on thousands of people in Calcutta. On 7 October 1896, Haffkine started work in the Petit Laboratory at the Grant Medical College, Bombay.

In 1894, S. Kitasato and



Waldemar Mordecai Haffkine
who developed anti-cholera
vaccine

Yersin had established that the bacteria, *Pasteurella pestis*, caused plague. (The reputed Indian surgeon in ancient India, *Susruta*, had also made a mention of rats and plague). These bacteria were found in large numbers in the enlarged lymph nodes (buboes), in the sputum tinged with blood, and in urine and stool samples of the affected individuals. However, the preparation of a plague vaccine involved more detailed work on these bacteria which was meticulously carried out by Haffkine. Highly committed to his work, on 10 January 1897, Haffkine inoculated himself with the plague vaccine which he had prepared. When he was sure that the inoculum was safe, he next inoculated several public-spirited men. On 16 January, 1897, Haffkine announced to the Government of India the preparation of a fluid which on inoculation, provided protection against plague. In the course of his work, it struck him that a few precautionary steps can protect one from getting the disease. These steps involved killing rats or keeping away from them and improving the living conditions of people.

It was a question of time before the plague vaccine was accepted by people as a protective agent and millions of lives were thus saved. For this work, Haffkine was honoured by Queen Victoria with the Companion of the Order of the Indian Empire. On 10 August, 1899, his laboratory, then called the Plague Research Laboratory, was shifted to more spacious accommodation at Parel, which was previously the residence of the governor of Bombay. At that time Haffkine held the post of Director-in-Chief. Later, in April 1906, the name of the laboratory was changed to the Bombay Bacteriological Laboratory and on 10 August, 1925 to the Haffkine Institute, in honour of this great scientist.

HOW PLAGUE IS CAUSED

Plague is caused by the bacteria, *Pasteurella (Yersinia) pestis*, which live in the blood of wild rats. Somehow these bacteria do not affect the wild rats living deep in the earth. The bacteria are transmitted to other rats, animals (wild dogs) and man via the fleas, *Xenopsylla cheopis*, carried by rats. To eliminate wild rats of the disease is nearly impossible. This fact is supported by the sporadic incidence of plague in different parts of the world in recent years, especially after ecological disturbances, like earthquake, floods and wild fires. These conditions disturb the natural habitat of the wild rats, forcing them out into the open to mingle with sewer or house rats. But the

disease can be prevented from spreading in a community by breaking the chain of contact between rodents and humans. This demands that we eliminate or distance ourselves from the places frequented by rats and stray dogs. Sewers, garbage heaps and unhygienic surroundings are the main reservoirs of these animals.



Many Sulabh toilet blocks were constructed after the plague in Surat which is today among the cleanest cities of India, also because of mobilisation of people's support for sanitation plans

Transmission of plague bacteria from rats to man via the rat fleas first leads to the bubonic form of plague. Characteristic swollen lymph nodes occur in this form of the disease. Untreated, the bacteria can find their way into the blood stream and cause the more severe septicaemic form of the disease. The high infectious and often fatal pneumonic plague occurs when the lungs are colonized by the bacteria. Soon these bacteria show up in the sputum and become air-borne and thus the disease becomes highly infectious.

Though antibiotics can cure plague if diagnosed in the early stages, there is great fear associated with the disease. Today this fear is unfounded. When conditions of plague exist, vaccination with an anti-plague vaccine can save many lives. However, reliance on vaccination cannot be a substitute for clean surroundings. Besides, several problems can arise with any mass vaccination programme. For instance, the plague vaccine based on attenuated or weakened bacteria (like most other vaccines for bacterial diseases) provides only short-term protection against the disease. Second, the vaccine may get contaminated in transit and cause complications. Indeed, the Malkoval episode in the Punjab in 1902 when 19 people died due to contamination of plague vaccine in a mass vaccination programme vividly brings out this point.

In 1902 an all-out inoculation campaign was planned in the Punjab, as the disease was spreading in an epidemic form in several villages. A large batch of vaccines was rapidly prepared under Haffkine's supervision in Bombay and transported to different places. But 19 had been inoculated from the bottle of vaccine containing brew No. 53N. Before investigating the situation, Haffkine and his laboratory were charged with carelessness and he was suspended without pay. Later Haffkine was honourably exonerated, but the incident left a deep scar on him. The long process of a Commission of Inquiry stretching over five years finally established that the deaths were due to careless handling of the vaccine by the field staff.

The initial outbreak of plague (or other plague-like diseases) in September, 1994, in Surat, Gujarat and the Beed district of Maharashtra, followed by its spread to other parts of India, is a warning to us to clean up our surroundings. In fact, this opportunity should be used to take a close look at the way we have organised our lives in our cities and towns. Scant attention has been paid to the quality of life, especially of our masses. Our villages and forest areas are also unhygienic, with numerous reservoirs of pathogens. Proper waste management and disposal systems, both of liquid and solid wastes, with special emphasis on disposal of human excreta, combined with provision of clean drinking water should be at the top of the agenda for scientific and healthy urban and rural planning. (Source: *Microbes and Disease* by Bakhtaver S. Mahajan) ●

A Profile

Dr. Bindeshwar Pathak

Ph.D., D.Litt.,

Founder,
Sulabh Sanitation Movement

Date of Birth

April 2, 1943

Place of Birth

Village Rampur Baghel, District Vaishali,
Bihar, India

Education

- 1964: Graduation in Sociology.
- 1980: Master's degree in Sociology, topping the list from Patna University, Patna.
- 1985: Ph.D., on "Liberation of Scavengers Through Low-Cost Sanitation" from Patna University, Patna.
- 1986: Master's degree in English, topping the list from Patna University.
- 1994: D.Litt. on "Eradication of Scavenging and Environmental Sanitation in India - a Sociological Study", Patna University, Patna.

Profession

Founder Sulabh Sanitation Movement

Indifferent to fame and fortune, Dr. Bindeshwar Pathak works to rescue scavengers from the tyranny of the social system in which one man's excreta is another man's headload.

KINGS, captains and politicians make headlines by winning war or making peace. But, nothing is older (and colder) than yesterday's headlines and those who make them are forgotten like bad dreams. There are other people who miss the headlines but make history. The US President Bill Clinton is making headlines while Dr. David Ho is making history. Dr. Ho, a Taiwanese graduate at the California Institute of Technology and a *TIME's Man of the Year* (1996) Award winner, just asked the right questions and he is close to finding a cure for AIDS, the most appalling curse for mankind. Similarly, Dr. Bindeshwar Pathak, working away from media blitz



"If I have succeeded in my efforts more than others, I owe it less to any superior strength of mind than to a habit of hard work."

to improve environmental sanitation, health and hygiene, is close to solving a great social problem by abolishing scavenging and, in the process, making a history which will be remembered much after everything is lost in the silence of time.

Great movements first begin in the minds of men before they spill over the brims to bring about enormous changes in the system. Social inequality, discrimination, deep-rooted caste system and exploitation - made worse during long colonial rule - have made India a land divided against itself. Such a society produces reformers, crusaders, revolutionaries or killers who seek to change things by fair means or foul. These change-agents, however, had different problems or persons who agitated their minds. Jesus had Roman Procurator of Judaea Pontius Pilate, Ashoka had seen the massacre in the Battle of Kalinga, Prince Siddharth walked past a dead man to become Lord Buddha, Mr. Isaac Merrit Singer's (1811-1875) mind was agitated over his wife's struggling to sew up his torn clothes, and James Watt had watched steam blowing up the kettle top, the energy which Stevenson turned into locomotives that made the world move. Lord Gibbon says that all great changes have small beginnings. However, the only common factor in all great events is that right questions were asked as Dr. Ho did, so also Newton, much, much before him: "Why does the apple fall?" And, the world was never the same again.

In lines with these, a young boy also asked the right questions when his grandmother scolded him for touching a scavenger - the man who manually cleans and carries human excreta only to be hated by all and to remain an untouchable

in society. Who is this mysterious, frail and frightened man, flitting between shadows, cleaning toilets and stomping the ground to warn of his coming so that others could stay away from his touch? What do they do? Where do they live? What is their history and geographical spread? Why do people hate them while they do the most important work of keeping places clean? And, while struggling to find answers to these questions, the *Sulabh Sanitation Movement* was born, more by accident than design.

After studying scriptures, Dr. Pathak found scavenging had no religious sanction either and those who practised untouchability commit a sin; it is unproductive and revolting to manually clean excreta and we are wasting the wealth which can be profitably used to raise farm production and generate biogas which he has demonstrated successfully. He sought to abolish scavenging not only out of sympathy for scavengers, but also out of the belief that it is a primitive, expensive and unclean practice which may create an explosive situation when a highly disaffected group may turn lumpen and work to destroy the social system which we took ages to build. For that matter, Sulabh is different from other social movements; it is an indigenous concept based on experience and has been tested scientifically, combining in itself an appropriate sanitation technology, an ideology, demand for public morality and social accountability.

Dr. Pathak had no epiphany, no singular revelation, no moment of truth, no divine message but a steady accumulation of a thousand slights, a thousand instances of indignity, a thousand unremembered moments of remorse and anguish that produced in him anger, rebelliousness and a strong desire to fight the system that has enslaved scavengers. There was no particular day when Dr. Pathak said: "Well, I will work to help scavengers." Instead, he simply found himself drawn into the Sulabh movement without even planning for



The day begins with prayer

it. It was his destiny and future – at once awesome and fascinating. And, that has changed the lives of millions of scavengers and other disadvantaged groups of people as seldom any other social movement did before.

Dr. Bindeshwar Pathak was born as the second son to Smt. Yogmaya Devi and Pandit Rama Kant Pathak in Rampur Baghel village of district Vaishali, Bihar, in a traditional Brahmin family. His mother was central to his life and had enormous influence on his character. A pious housewife given to good old virtues and religious beliefs, she loved her second son very much possibly because she saw in him the saviour of the family which had fallen on hard times. That was also because Bindeshwar, the boy, showed confidence and the bearing of a man who was sure of his future. His father was a respected leader of the community and a big spender (a habit that he passed on to his second son) given to performing social rituals. Both the



A happy family

parents were, however, firm in the belief that education alone would help the family get out of difficulty. However, Dr. Pathak's maternal grandfather, Pandit Jainandan Jha, a Gandhian and freedom fighter, was the 'role model' for young Bindeshwar who has inherited the latter's commitment to social service and the habit of doing things differently. And, boldly. "The more I live, the more I respect the teachings of my parents, not only as ideals but also as practical guides to life. They gave me a life of love and compassion beyond my dreams". No wonder, what sets Dr. Pathak apart from others is less the quality of his mind than the warmth of his heart, although his life has always been surrounded by risk, drama, mystery and uncertainties.

Dr. Pathak's childhood was spent in poverty in a home in

which his mother, a stern but amiable moralist, instilled in him the eternal truths that she held dear. His father infected him unconsciously with his endearing traits of forbearance and cheerfulness. A perfect marriage with Smt. Amola Pathak on July 2, 1965 did the rest. Madhubala was born to them in 1973 when the family was in the midst of struggle; with the coming of Kumar Dilip in 1975, the second child, the struggle was intense no less. And, when Kiranbala joined in 1977, the size of the family more than doubled, with a five-member unit living in an idyllic world. After

marriage, Dr. Pathak had not enough money to buy things for his wife when she was to visit her father's place. The young Bindeshwar cried for the first time, not knowing his future.

Dr. Pathak had no ambition higher than finding a job because there was no money to buy food, nor many persons to lend it. Trudging in torn *khadi pyajamas* and broken *chappals*, he did his graduation and started looking into the future. Until then, he had no thought of fame or name or power; he just wanted to become a teacher and live like all teachers did - in respectable poverty. However, crises never weakened his resolve to succeed.

Dr. Pathak does not forget the days of his miseries when he worked as an errand boy at a tea stall in Patna. He keeps all his friends and colleagues of those days in comfort and looks after them and their families. He remembers every man who may have done him any small good and re-pays them many times over. He calls it *debt of honour*. "When I find him sad, I discover that he has no money to give away", says his wife. ("All

His achievements at a glance

| | |
|--|----------------------|
| ● Scavengers liberated and rehabilitated | 50,000 |
| ● Sulabh household toilets | 10,00,000 |
| ● Sulabh community toilet blocks | 3,154 |
| ● Human excreta-based biogas plants | 68 |
| ● Towns made scavenging free | 240 |
| ● Scavengers trained and resettled | 3,500 |
| ● Towns where Sulabh works | 987 |
| ● Districts where Sulabh works | 338 |
| ● States/Union Territory | 22 |
| ● Persons using Sulabh facilities | 10 million every day |
| (up to April 1998) | |

progress is based upon an innate desire to live beyond one's income', says Samuel Butler.) His compassion is legendary, specially for scavengers. His entire life is identified with their miseries and salvation. He asks questions like a child (*a la* why does apple fall!) and answers them like a philosopher. He is mystical and distant and lost in emotions, constantly in search of new frontiers. Alexander once said: "If I were not Alexander, I would also have been a Diogenes" (a Greek *fakir* and philosopher). Dr.



Pathak would have been a *fakir* if he were not the founder of the largest and the most powerful social movement of the second half of this century.



The Founder and Mrs. Amola Pathak with their grandchildren

The stories of his helplessness are depressing no less than those of his latter-day achievements are uplifting. Both are heard with eagerness of how a wanderer Bindeshwar became Padma Bhushan Dr. Bindeshwar Pathak, winner of Italy's Saint Francis Award for the Environment - "*Canticle of All Creatures*"; Goenka Award and a string of other national and international awards and honours in

recognition of his seminal contributions to the liberation of scavengers, social reforms, promoting rural and urban sanitation and, to top it all, working for creation of a new social order based on fairness and justice to all. The Citation of the *International Saint Francis Prize for Environment - "Canticle of All Creatures"*, Assisi, Italy, says: "Dr. Bindeshwar Pathak is a pioneering

environmentalist, humanist, social reformer and renowned expert on the low-cost sanitation technology." Many international agencies and national organisations have recognised his pioneer work to liberate scavengers from the demeaning practice of manual handling of human waste in areas of high demographic density – India, Pakistan, Bangladesh, Nepal and other developing countries.



Dr. Pathak had always supervised toilet maintenance himself. He does it even today amid tight work schedule

Dr. Pathak, Founder of the *Sulabh Sanitation Movement*, is also known for his contributions in the fields of human rights promotion, creation of non-conventional sources of energy, etc. by combining in himself the traits of an engineer, action sociologist, planner, administrator and a social reformer. He joined the *Bhangi-Mukti* (scavengers' liberation) cell of the Bihar Gandhi Centenary Celebrations Committee in 1968 when he was intimately exposed to the problems of scavengers in India. That agitated his mind when he started asking questions. And from that quest was born the mighty pan-India sanitation and social reform movement whose echoes resound not only in the land of its birth, but across other continents too.

What marks Dr. Pathak out from the rest of his ranks is his grassroots *Sulabh Sanitation Movement* that aims at improving the living conditions of the poorest among the poor. The Movement is a peaceful revolt against social prejudices, a firm demand for change and personal protest of the "wanderer boy". The Sulabh has a pan-India sweep, covering all sections of people in almost all the States of the country. Sulabh has also set up an English-medium Public School in New Delhi for children of scavengers with a view to equipping them with skills to be able to compete in open job market. Dr. Pathak says that job reservation cannot

take any social group very far; at best, it is a short-term solution. Eventually, scavengers will have to be trained, educated and prepared to fight their own battles, instead of someone else fighting for them. He has set up training centres; opened cells in the states to help liberated scavengers get jobs; persuaded the Government of India to cover scavenging under the *Protection of Civil Rights Act* and declare scavenging unlawful. On his persuasion, late Rajiv Gandhi, Prime Minister of India, included abolition of scavenging in the 20-Point Programme.

The Sulabh Founder never tires of telling how the conditions of scavengers had always pained him and once when he touched a scavenger, he was made to take cowdung and urine to *purify* his soul. This remained a lasting scar on his mind which finally made him work for abolition of scavenging in India. Dr. Pathak travelled all over the country, visited and lived with scavengers in their *bastis*, studied their habits and social mores (he did his Ph.D. on scavenging), their history and geographical spread to eventually declare that scavengers were a special class (*a basket case*) united only in their miseries and social degradation.

"I LOVE SULABH TO THE POINT OF MADNESS"

The Sulabh Founder is eloquent, honest, humane, easy to befriend and easier to win over. His relaxed manners, shy smile (he blushes like a teenager) and soft voice make one wonder if he

is same the
p e r s o n
working to lift
the mountain,
as it were,
without raising
the dust. His
innocence is
awesome, no
less than his
manners are
compelling. He
sings, rises
early to watch
i n t o
nothingness



Enjoying happy time in a theatre

and think alone. At times, he is impetuous and always impatient as if time flies out faster for him than for others. He is poor at small talk and, hence, uncomfortable in the company of women. An intensely private person, Dr. Pathak is a devoted husband, loving father and a good employer who measures everything in terms of Sulabh which is not a mere movement for him - but a passion, life-breath, his first-love and sweetest of all dreams. "I love Sulabh to the point of madness", he says.

Most miseries, says Dr. Pathak, are caused by the human desire to rule over others. It is a matter on which history does not comment; it is assumed. And, those who sought to acquire the power to control the life of others are lost in the deeper shadows of antiquity. Exploitation is not modern; it is expensive, inhuman and uncivil. Idealism is also an economic concept because this alone can bring about social benefits. Democracy can create many things in people - passion, ambition, selfishness, and even corruption. But, it cannot long endure on the foundation of exploitation and social injustice of which scavengers are the worst victims. He says that past, which is dead, cannot be a guide to future, which is unborn. Indians must not carry the burden of their lost glory. No society has sacrificed more for this historical obsession and none has received fewer benefits from it.

Dr. Bindeshwar Pathak considers himself a man of destiny, wedded to a cause which he has not been able to define fully yet. The rolling hills, distant drums and the vanishing horizons fascinate him, saying: "*The faraway hills are the greenest.*" He conceives of situations beyond the borders and far beyond his control, always working in the belief that we are living in extraordinary times when change in one country will produce change in the other. All bloody revolutions had failed to deliver stability, prosperity and good life to the people which are the objectives of all social movements. Being a great communicator, he has enormous power of persuasion through raw and ruthless logic, or sheer scholarship. He concedes points peripherally only to preserve the core area of his faith and belief. If he loses in any argument and debate, he says with easy manners "...but it is an error in right directions". And, his critics are disarmed and accept defeat in victory. How can you disagree with a person who says that the world should be clean and people healthy to live in a discrimination-free social order, at peace with itself. He encourages open thinking and positive doubt; he trains people

to identify goals and then generate ideas, using imaginative, intuitive and blue-sky thinking to produce actionable programmes. The Sulabh Founder says that the organisation that does not innovate itself, ages fast and declines. In a close system of thinking, the employer wants to hear only comfortable ideas, while the fact is that the manager must avoid doing what is easy, obvious and safe and learn to think differently to be able to respond to change. He says: "*Crazy ideas sometimes work wonders*".

His is a diverse personality. Apart from the software side of the movement, it was he who initiated the engineering projects like the on-site effluent disposal system, cleaning waste water through duckweed and biogas from human excreta, the clue for which he got from a tribal near Indore. He is a pathfinder; his probing mind never ceases to probe. And, after launching new ideas, he hands them over to distinguished engineers who carry them forward. When it comes to accounting, he is a bit of wizard; even a veteran chartered accountant will find himself diminished while discussing balance-sheets with him. Nobody can short-change him on accounts because he had been a top-scorer in mathematics in school which has also created in him the habit of clear thinking and intellectual discipline.

GLOBAL IMPACT

His most important contribution is that he has dramatised sanitation to make it a national and international issue. He succeeded in persuading Mr. Morris Strong, Secretary-General to the Rio's Earth Summit (1992), to take sanitation on *Agenda-21*. At a series of the Water Supply and Collaborative Council Meetings at Rabat, Manchester, Colorado and Manila, Dr. Pathak warned of shrinking water supply and falling standard of sanitation, specially in the Third World countries where most poor live and suffer in various ways. For once, it was realised that geography and political systems do not divide the boundaries of nature whose capacity to meet the man's growing need is diminishing following the rise in population and the level of consumption. And, if it happens, leaders of the world fear, the days of modern civilisation may be numbered. Growth has to be self-sustaining.

Dr. Pathak has been telling leaders and decision-makers that the growing population and the consequent urbanisation

have created the sanitation problem which is not only a social question but an economic challenge also because an unclean and unhealthy society cannot raise production and productivity. He has set up the first Museum of Toilets of its kind in the world to encourage study and research on toilet designs; set up various engineering, and research centres to coordinate global efforts at promoting sanitation. Scavenging is only one part of the *Sulabh Sanitation Movement*, the other part is to create a new sanitation order. He has proved that serving the people can also be a profitable work by putting in place teams that make things happen - teams of engineers, administrators, academics, field-workers and planners.

"*Serve and earn*" has been his slogan. He says that the social organisation which is economically not viable cannot go very far. The aid and subsidy regime cannot endure; money will dry up and the movement will collapse. Therefore, he has been pressing the Government to give NGOs service charges so that they can make a living by serving the people and look after their families as well. These and many more innovative ideas are there on the impressive list of programmes envisaged by Dr. Pathak who has combined in the *Sulabh Sanitation Movement* the Gandhian ideology and good economics of Adam Smith. "They mix very well: all that we have to do is to roll up our sleeves and try". Dr. Pathak broadly seeks to achieve the following objectives through the *Sulabh Sanitation Movement*, launched in 1970:

- To liberate scavengers from the cruel practice of carrying human excreta on the head (a dream of Gandhiji which never came true in his lifetime) and to rehabilitate them in other professions after training and education. About 50,000 scavengers have been liberated and re-settled in other professions so far.
- To socially upgrade them. A large number of well-off families, including former Prime Minister, Mr. I.K. Gujral and other leaders, judges and academicians, have adopted scavenger families as part of social upgradation programme.
- To prevent environmental pollution caused by open defecation by providing affordable, indigenous, scavenging-free and sustainable pour-flush toilet system in individual houses and at community centres. The toilet facilities set up by him is now being used by about 10 million people per day.

- To obtain biogas from human excreta for various uses and also to obtain organic manure for raising productivity of the soil. As many as 63 such plants have been set up in India.

TECHNOLOGY IS APPLIED REASON

Dr. Pathak has raised a micro-level project on cost-effective sanitation (starting in 1973 from Arrah, a small town in Bihar, where he put up two pour-flush toilets for demonstration) to the macro-level where sanitation has been globalised. The Sulabh technology has been widely accepted because it is effective, technically sound and sustainable at micro and macro-levels. No other individual in India has raised the technology application from a small town to an international level. This distinction was conferred on Dr. Pathak when UNDP, World Bank and other national and international agencies recommended its adoption in other countries. Technology is applied reason (or science) which has played a very decisive role in the Sulabh Sanitation Movement. The Sulabh technology is a very simple device, an improvement on those already developed at PRAI, Lucknow. It consists of two pits and a sealed cover. While one is in use, the other pit is left to mature. And, finally, the content is cleared to be used as manure. By using this technology, there will be no need to physically clean human excreta. This was named as "*Sulabh Shauchalaya*" and it could be adopted in different hydrogeological conditions with some changes. He knew that slogans alone will not help and, hence, developed a technology which has become a credible alternative to scavenging in India. Because of the technological underpinning, the Sulabh Sanitation Movement can be compared with the Industrial Revolution of 1848. All other movements in India represented only good intentions gone awry. He convinced administrators, planners and engineers about the successful functioning of the two-pit pour-flush toilet in urban areas which could be an affordable, safe and hygienic system for the disposal of the human waste. The new technology was a breakthrough in the Government of India's programme for eradication of scavenging as the Sulabh system is affordable, acceptable to the masses and could be set up with the available local materials.

Dr. Pathak says that winning leaders understand that ideas

are essential tools for shaping and motivating organisations. And they generate these ideas by constantly seeking new information, reflecting on their own experiences and searching for insights, not only into technology and human behaviour, but also into the larger world around them. The *arrogance of ignorance* is dangerous and harms the organisation. One's own ideas get enriched by other ideas, by philosophy and by thinking through the basic issues of life. In winning organisations, the source of the ideas is not what matters; it is the fact that the top leader embraces new ideas, spreads them throughout the organisation and encourages others also to have good and new ideas. In all the winning organisations, idea cascades through the ranks. Workers at each level draw off the central ideas. The fundamental quality of a good leader is to take new ideas to all levels and that will drive the organisation to success, says the Sulabh Founder.

As a Renaissance man, Dr. Pathak is in love with new ideas, always in search of ways to do things differently. The Sulabh technology was a new idea, the rapid adoption of which resulted in 240 towns made scavenging free. And, 50,000 scavengers have been liberated and re-settled in other professions. This has been made possible by converting ten lakh bucket latrines into Sulabh toilets in 28 years. Dr. Pathak has achieved this success in the sanitation field, working with a narrow resource base and almost single-handedly, leading a voluntary and non-profit agency. The World Bank, UNDP, WHO, UNICEF, and other national and international agencies have recommended Sulabh technology use as a viable alternative to the expensive sewerage system. And as stated earlier, Sulabh has been declared as the *Best Global Practice* at Habitat-II conferences at Istanbul, June, 1996. For that matter, Sulabh is a knowledge based *moral enterprise*. The primacy of morality and new ideas are the defining features of the Sulabh Sanitation Movement which is an attempt to organise people for a cause.



UNTOUCHABILITY WORSE THAN APARTHEID

The most revolting thing about scavenging, says Dr. Pathak, is not that scavengers

clean and carry excreta; mothers, nurses and others also do it. In China, family members themselves carry excreta to dump it at common places. They are not untouchables, but most loved and respected members of the family. Nothing like untouchability existed anywhere in the world except in



Dr. Bindeshwar Pathak with Mr. Jayaprakash Narayan and Mr. Jagjivan Ram at Kadam Kuan in Patna

India. Even Roman slaves were not untouchables, nor were those captured Africans who were sold in open American markets by the weight of their flesh. They worked in whitemen's homes, even as cooks.

Apartheid (apartness) also represented codification of all the laws and regulations that kept Africans in inferior positions to whites for centuries. But, apartheid victims were not made untouchables. And, to fight this system, Nelson Mandela had to spend 27 years of his life in jail on Robben Island, off Cape Town. Spartacus, a Roman gladiator, also revolted against this system and was killed along with thousands other slaves in the desert of Judaea. Between the period of the Spartacus murder in 71 BC and the American Civil, marked by the assassination of Lincoln in 1865, the world had accepted discrimination as a fact of life until Mandela began the battle against it in South Africa where Mahatma Gandhi led many tumultuous processions crossing Natal into Transvaal to violate apartheid laws. Gandhiji's son, Manilal Gandhi, continued to support Mandela's fight through the newspaper, *Indian Opinion*, which he edited.

The often haphazard segregation of black Africans was consolidated into a monolithic legal system which was diabolical in its detail, inescapable in its reach and overwhelming in its power. The premise of apartheid was that whites were superior to Africans, Coloured and Indians, who were called "coolies". Apartheid was supported by the Dutch Reformed Church and other religious



SON AND DAUGHTERS : Kumar Dilip, Madhubala and Kiranbala

authorities, who said that *"whites were the God's chosen people and the blacks were a subservient species"*. In the African worldview, apartheid and church went hand in hand. It is strange that all injustices, exploitation and cruelty perpetrated in the world had the approval of religion. Or, what passed for it.

However, there are many common features between apartheid and untouchability. Apartheid had the sanction of law passed by whites (one million) to segregate blacks (12 million). Pass Law, Population Registration Act, Immorality Act, Separate Representation Act, Group Areas Act and Mixed Marriages Act were some of the many, many acts passed during the regime of prime ministers Jan Smuts, P.W. Botha, and Verwoerd, - all rabid white racists who kept blacks limited to slum areas where they worked for white mining companies - bent, starved and destroyed since Cape Town was founded in 1652 by John Van Riebeck of the Dutch East India Company. This was also the place where Cecil Rhodes set up his first home to later rampage the entire Africa and plunder its wealth. They came with the Bible in hand and captured the entire Black Continent, subjecting them to apartheid. Archbishop Desmond Tutu, Nobel Prize winner, describes it thus: "When they (White) came to Africa, we had the land, and they had the Bible. They asked us to pray. After we opened our

eyes, we had the Bible and they had the land."

The story of untouchability in India is no less distressing. Instead of law (as in South Africa), untouchability in India has elaborate sanction of non-Vedic religious books. The Brahmonical order, religious rituals and superstitions have only made worse the practice of untouchability which also divides society into iron-clad caste system that is manifest in politics and personal relationships today. Both apartheid and untouchability had the approval of society and religion; both turned into an acceptable social order after long use, both deprived one section of people of their basic rights, both the systems were imposed with cruelty (widow burning is also a gender apartheid), both the systems produced revolutions and both of them are major causes of the poverty and backwardness of the affected people.

When Gandhiji returned to India (via London) from South Africa on Jan. 9, 1915, he had already known the ways of fighting the apartheid. However, much of his time was spent in fighting the British and soon after Independence he was assassinated. Thus, his social reform agenda remained incomplete though enough work was done by him to lay the foundation of many social reform movements. Sulabh is the one. Dr. Bindeshwar Pathak was exposed to these realities when he was working with the Gandhi Centenary Committee in Patna. His extensive reading later only reinforced his determination to carry on the Gandhian battle to end untouchability. Hence, the Sulabh movement should be seen in the historical continuum to know its full impact on the transformation of society and the role of Dr. Pathak in making it happen with the focus on the scavenger, the untouchables among untouchables.

RAJA RAMMOHAN ROY AND DR. PATHAK

There are strange similarities between Raja Rammohan Roy (1772-1833) and Dr. Bindeshwar Pathak, although more than 170 years separate them on time spectrum. Roy was a Brahmin, so is Dr. Pathak, and both revolted against Brahminical order; both treated education (and technology) as an instrument of social change. Roy set up *Brahmo Samaj* (the society of Lord Brahma, creator of all human beings - Hindus and non-Hindus), while Dr. Pathak has set up Sulabh, also with a universal vision of unity of human species. The *Sati* system provoked Roy to revolt against the social

order; it was scavenger for the Sulabh Founder. Both want social reform and not revolution; consensus and not conflict. Roy had also studied at Patna where he was exposed to the cruelty against women. Both of them have written copiously and produced magazines; both are great communicators, both treat the Vedas as reference points in their discussion; both are rationalistic in their approach. Roy was a cultured, sophisticated and media-savvy determined crusader; so is Dr. Pathak. Both of them have condemned the caste system, saying that it is founded on the irrational concept of birth in the choosing of which nobody has a hand. No wonder the Hindu society has shown, throughout its history, a low capacity for resistance to external attack. And, consequently, centuries of slavery, social degradation and disintegration followed.

Raja Rammohan Roy was born 15 years before the Battle of Plassey was fought and lost; Dr. Pathak was born four years before India's Independence, the battle which was fought and won. Both the battles had considerable influence on both social leaders, although in different ways. Both represent the spirit of Renaissance with the willingness to absorb Western knowledge through the English language. Both seek the restoration of Hindu faith to its pristine glory and simplicity. Both of them are fearless and defiant in the face of formidable challenges. And, finally, both of them owe their eminence to their vision for tomorrow's India which will be without caste or gender discriminations.

However, there are dissimilarities also. Roy was born in Radha Nagar in Hooghly district of the former Bengal Presidency to landlord parents of great eminence. His forefathers were recipients of the title, *Ray Rayan (Raja)*. They had served the Nawabs of Bengal. Roy was given an extensive education in English, Arabic, Sanskrit and Latin which equipped him to promote his concept of inter-faith unity. And, later, he worked with the East India Company where he came in contact with influential Englishmen who called him *Augustus of the East*, *Luther of the Hindu Renaissance* and *India's Columbus in the discovery of a new continent of Truth*. His vision of India was:

"My country in the days of glory past,
A beautiful halo circled round their brow!!

Roy addressed the middle class, mostly English educated under the employ of Britishers. The middle class consisted of conservatives, radicals and liberals. Conservatives, who were

created under the impact of attack on Hinduism by Christian missionaries, argued that religious practices were divinely ordained and had deep spiritual significance, however ugly their outward manifestations. They feared that once reforms were accepted, there would be no end to it and, finally, Christianity will take over. Radicals were products of European Renaissance and English education but their ill-defined profile on the spectrum of social reforms made people call them "Anglophils" and appendages to British rulers which they were in abundant measures. Liberals were different breeds; they were influenced by the thoughts of Descartes Hume, Kant, Spinoza, Hegel, Schopenhauer, Darwin, Mill, etc. Swami Vivekanand represented this tradition in its full glory. His powerful speech at the Chicago World Parliament of Religions in 1893 made him "*undoubtedly among the greatest figures of all times*".

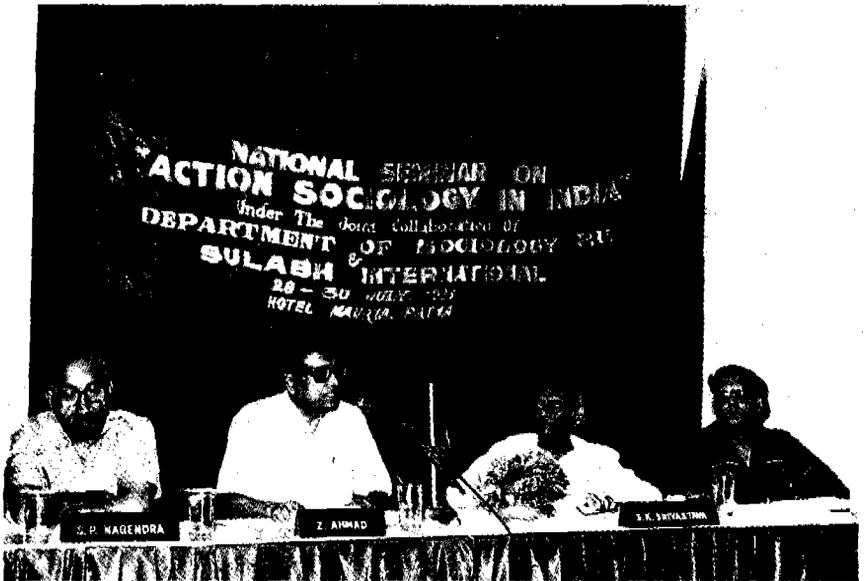
Unlike these, Dr. Pathak did not have the advantage of the pedigree which Roy had, nor had he that kind of extensive education. Dr. Pathak did most of his research and advance study when he was in the thick of Sulabh struggle. Unlike Roy, the Sulabh Founder provided technological underpinning to many social problems. He says that if there were a technology for cotton plantation, there would have been no slavery in America and Lincoln might not have had to fight a bloody civil war. Hence, along with developing a social model of growth, Dr. Pathak also developed a technology which will one day abolish scavenging and free scavengers without any conflict. And, instead of addressing the middle class, he talked to the poorest among the poor, scavenger, and instead of *temple*, he made *toilet* the centre of the Sulabh revolution.

Very clearly, Dr. Pathak is the product of modern India, inspired by information, technology, science and the global concern for human rights. And, he has made full use of his knowledge and communication skill to drive home the point that scavenging is also a human rights question and made the authorities move in the matter. Mr. Rajiv Gandhi, on his persuasion and pressure, made abolition of scavenging part of the 20-Point Programme and Mr. Narasimha Rao, (both of them former Prime Ministers) set a deadline when this practice will be abolished. Roy had also persuaded Governor-General Warren Hastings to ban *Sati*. But, Roy worked from top to bottom while Dr. Pathak works from bottom to the top. Never in the human history, was toilet made the centre of a great social movement. The French Revolution had

Bastille; the American Revolution had the Hall of Philadelphia and the Sulabh revolution had a toilet in a backyard of Arrah district of Bihar. "One does not know how strange are human affairs!!" Marx said: "history repeats itself twice, first, as a tragedy and, second, as a farce". In this case, it was neither.

It is a co-incidence of history that most reformers were Brahmins - Raja Rammohan Roy, Bankim Chandra Chatterjee, Swami Ramkrishan Paramhans, Ishwar Chandra Vidyasagar, and Dayanand Swami. However, Swami Vivekanand once said in irritation: "If Brahmins have more aptitude for learning because of heredity, don't spend money on their education and give it to untouchables. They need it more". Dr. Pathak also reiterates this sentiments when he says: "There is no disparity in Indian society except disparity in education. Give the modern education to the poor, and they will take care of themselves." These similarities across the huge time gap indicate that although the world has changed vastly during the past 170 years, the basic problem of man exploiting man (woman in case of Roy) remains unsolved despite tall claims of human rights, equality, universal suffrage and so forth. And, that is essentially the source of conflict which both the social reformers seek to abolish in the fractured and atomised Indian society.

Sulabh has no similarity with the Arya Samaj founded by Swami Dayanand in Bombay in 1875. Born as Mul Shankar, son of a Samavedi Brahmin, he grew up to become Swami Dayanand, a great scholar, leader and polemist with the rugged individuality of Martin Luther who believed that the Hindu religion and the Vedas, on which it was based, were eternal, unalterable, infallible and divine. The Vedic religion alone was true and universal. He held that the Aryans were chosen people; the Vedas the chosen Gospel and India, the chosen land. All other religions were imperfect and it was the duty of the Arya Samaj to convert the followers of other religions to the Hindu faith. Swami Dayanand set up many centres of learning. He was the first Hindu reformer who turned from defence to attack, from protecting Hinduism from Islam and Christianity to fighting the leaders of rival religions. His work *Satyartha Prakash* raised controversy and caused communal clashes. Sulabh, like Brahmo Samaj, had nothing to do with religious rivalries although its concept of the "*back to the Vedas*" are the core to the Sulabh thought system. Sulabh and Brahmo Samaj are reforms movement while Arya Samaj was virtually a new religion.



A national seminar on *Action Sociology* organised by the Indian Association of Action Sociologists, Patna, July 1986

ACTION SOCIOLOGY

Dr. Pathak quotes a variety of opinions, from sociologists and economist, to say that they were relevant only to their times. But, the principles of Action Sociology is valid forever, also because they are not doctrinaire nor fixed. These principles change with times; the only fixed thing about it is the target – the poorest among the poor. No theory should be considered *socially valid* until they are actionable or applied effectively and appropriately. The need for Action Sociologist arose because most sociologists have become book-bound and, thus, socially irrelevant. In truth, Sociology has been reduced to only a discussion point or a "pass subject" for weak students in colleges and universities because it has no "applied value" which Action Sociology seeks to produce.

The fact is that economic progress has turned out to be an empty promise. We had hoped to have a fairer society; a more ordered society; a society where people live sensible, quiet and decent lives. But, today we have societies which are deeply divided because, in our relentless search for *efficiency*, we are polarising ourselves into the *haves and the have-nots*. Work is priced either

very highly or at zero (like the labour of housewives, children etc.). So the rich get richer and the poor get poorer, sometimes in relative terms, sometimes in absolute terms. We have an emerging *underclass* and a growing *overclass*. For years, we have placed the pursuit of efficiency and economic growth above all else because we understood that to be the *path to progress*. We have done that at the expense of workers, communities and the environment. We have also applied the idea of *global competitiveness* to things that are not globally competitive. Dr. Pathak refers to the activities such as healthcare, education, local-governments, welfare organisations and small-service industries. They do not have to compete with the world in terms of cost efficiency. But by insisting that they do,

we are making efficiency more important than output; the methods more important than the result; this is what bureaucracy does. All rules are observed and accounts audited but no results. That is bad thinking and bad economics. We are creating a society that is not at ease with itself. **A c t i o n** Sociology seeks to correct this asymmetry.



WHEN HISTORY REPEATS ITSELF : Just as Prince Siddharth saw a dead man and became Lord Buddha, Bindeshwar, a young village boy, also saw scavengers cleaning human excreta and decided to make any sacrifice and bear any burden to end their miseries. The small agitation in his mind grew into a mighty movement to turn the tide of history.

Dr. Pathak agrees with Prof. Amartya Sen to say that Buddha was the greatest of all Indian thinkers, social reformers, economists and sages. The sight of an ill person, an old-man reduced by age and the dead man being carried to cremation set Buddha asking

himself; "What kind of life it is?" And, from this flows modern economics, says Prof. Sen. Dr. Pathak adds one more story. The thirsty Anand, disciple of Buddha, walked up to a well and asked a man for water. The man flinched and turned pale seeing tall, elegant and divine Anand in saffron and said: "I am a scavenger and, hence, untouchable; how can you drink water from the hands of an untouchable?" Anand lapsed into deep thought and said: "What were you born first - a human or untouchable? Your identity is of a human, the rest is false. Give me water, son, I am thirsty". From this statement flows the basic philosophical concept of the Sulabh movement. Dr. Pathak says Lord Buddha's 6th century BC understanding of human situations was dramatic and unbelievably deeper than that of any latter-day philosophers, economists or thinkers. From his concept of neutrality to religions is born Buddha's agnosticism and enlightenment. For that matter, Sulabh is also agnostic (neutral to castes and religions). Dr. Pathak says that problem is important to solve, irrespective of who suffers from it - scavengers or others.

Buddha's name itself indicates enlightenment; it emphasises education and understanding. The belief that *enlightenment* (understanding) can transform the world by rational thinking and cool analysis goes powerfully back to Buddha. His personality, combined with his concern for deprivation, death, illness, old age and enlightenment and with social intervention through good work - all these account for Dr. Pathak's fondness for Buddha. "He had great relevance then; he remains relevant today", the Sulabh Founder says.

While talking about the social theory of Prof. Amartya Sen, who has been awarded Nobel Prize for Economics (Oct 1998). Dr. Pathak says: "The theory of *social choice* is valid as far as it goes but his theory of *entitlement* is an all-time truth, also because it rejects the Western concept that once the economic growth (in terms of GDP) has taken place, poverty is reduced. As a matter of fact, poverty and affluence can grow together until there is *social intervention*". Pareto's (Vilfredo Pareto 1848-1923) *theory of optimality* is also false. The study of this theory was done in European (rather Italian) context where Pareto lived (Florence) and worked. Through his clever use of mathematical tools, he argued that the *state of optimality* is the situation where nobody can be better off without somebody becoming worse off ". Nero fiddled while Rome burned was a *optimality situation*; that is putting out the fire to save Rome would not have been possible without

making Emperor Nero unhappy. It was absurd to argue like that. But, this ideological position was extended to say that huge empires and great civilisations could be built only on ruins, oppression and exploitation. "Here history may be on the side of Pareto, but not justice," says Dr. Pathak, "most good things of life can be shared equitably, without creating ruins or exploiting the poor. These include education, healthcare, good sanitation, healthy environment and so on. This is what Action Sociology is all about - *caring and sharing*".

The *social choice* theory of Prof. Sen is also self-limiting. It says: "The *social choice* (say, in elections) may not be always individual choices. Since there are many ways of determining social choice (proportional representation, first-past-the-post etc.), it may not always be just and fair. After all slavery in the Southern states of America was the *social choice* (elected members adopted this policy); Hitler was also a duly elected chancellor of Germany. Instances are galore where patently unjust and unfair decisions were the *social choice* of the people. Hence, without commenting on the *theory of social choice*, Dr. Pathak supports Prof. Sen's concept of *entitlement* which means social, educational and economic empowerment that are *actionable* plans and concepts. And, hence, they come under Action Sociology which is yet another way of going *back to the basics*.

Sulabh *social choice* which consists in measuring economic and social growth in terms of poverty reduction (read elimination of scavenging). In a democratic society, like India, there cannot be one set of standards in the legal system (equality before law) and politics (every adult has a vote) and another set of standards in the free market economic system in which the poor have no social choice but to perish. "The cost-benefit concept has no moral constructs; it is sheer exploitation perpetuated by capitalist economists. For a fair and just society to grow, there has to be a social intervention to change the unjust system." Dr. Pathak quotes Newton's First Law: "*Every material body persists in its state of rest or of uniform motion in a straight line if (and only if) it is not compelled by any external force to change that state*".

This is true of social change as well, Dr. Pathak says. A scavenger (or a Harijan or a landlord) will remain the same until there is social intervention to change the *state of inertia*. The *laissez-faire* negates this truism and goes back to the Freudian theory of the "*survival of the fittest*" which could be true in the

evolution of living species but not while setting up a social system which has to be based on justice and equality. The Action Sociology, a new discipline that Dr. Pathak has set up, provides a conceptual basis for social action to bring about change. Marx also said: "We know history but the question is how to change it". We know sources of social injustices in India, but the question is how to change it. The state itself seeks to change things but not always for the common good. People, for instance, were driven to wars without knowing their enemies. In the book, *"All Quite on the Western Front"*, the hero (a soldier in the trench) says: "I do not know my enemy, a German, whom I killed, but I know my girlfriend whom I love. Murder no more - 'O' Lord, stop this carnage. I want to go home and meet my ailing parents and my sweet girl. I don't want to kill anymore".

What dictators did was state (not social) intervention which brought about miseries to humankind. For, the state is based on force and violence, and not on morality and ethics. For this reason, Dr. Pathak says, social (read NGO) intervention is necessary to set up a just social order. The Sulabh movement is a social intervention where the people seek to change themselves on their own and not by the state. The Sulabh movement combines in itself the Newton's First Law, Max Weber's thought on social change and Buddha's philosophy (that all human behaviour must have ethical basis) to set up a composite social system when the people will *"act and be acted upon"* both. in the process of change. "State can change the system but it cannot change the mindset. The world is infinitely varied and constantly changing. We have also to change or perish", says Dr. Pathak

The refusal to change leads to social unrest which may also cause massive migration of people as in Rwanda where people just walked and walked to fill the road, edge to edge, when only soft and weary whisper of feet was heard. The people used last scrap of energy just to keep moving in total silence. It was a sudden return of more than 450,000 Rwandan refugees from camps in Tanzania to their home country after the brutal upheavals in 1994 and 1995. Forced out of Tanzania, the refugees left the huge camps and started walking again to nowhere. Something like this happens everywhere. Behind the stable appearance of much of the world, the same kinds of numbers could be moving quietly, at airports, seaports, railway stations, along forested borders, and even where steel and barbed wires make barriers

that seem impenetrable – thousands upon thousands of people are on their way to somewhere new. They don't make much noise, but they change the world. Some 60 million Europeans left home after the last world War. Some 15 million Hindus, Sikhs, and Muslims swept up in a tumultuous exchange of citizens between India and Pakistan after the partition of the subcontinent in 1947. The US was populated by convicts, persecuted and migrating people who fled violence and war. This monumental misery happens in the countries that don't change. "Therefore, change, we must", says Dr. Pathak. Action Sociology tells you how!

VISION - 2000 PLUS

Dr. Pathak says that leaders must formulate a vision of the future society. The vision must be positive (not negative); it must be straightforward (not fuzzy); it must motivate men and women who live on the edge. This requires to be stated in clear words and biblical phrases; it must explicitly reject all *third ways*, based on incompatible combinations of contradictory visions. Man does not wait for brave new worlds, built on dreams, moral rhetorics, or on somebody else's preferences. It is absolutely impossible. Rather, people want a free and functioning social system set up on equity and people's participation. He quotes Adam Smith's vision of a free, and efficient society in which the citizen, not an enlightened monarch or an elitist intellectual, is the arbiter. For this to happen, Dr. Pathak says, the leader requires to know and follow the proven, time-honoured principles. Selling the vision requires one to address the people, to argue, to explain and to defend. It requires permanent campaigning and formation of standard public conduct without which leaders will have no support base to create policies, ideologies and programmes. Morality is central to the *Sulabh Vision - 2000 Plus*.

In practical terms, Sulabh has figures. There are 560 districts in the country, and seven lakh villages. If we construct two toilets in every village as models, it will add up to 14 lakh toilets which will cost about Rs. 280 crore to build. Sulabh's attempt is to build so many toilets and promote the sanitation movement. This is part of *Vision-2000 Plus*. The Sulabh Founder has also vision of a scavenger-free India where every house will have a toilet and every city centre will have full sanitation facilities, specially for women whose honour is the basic indicator of a civilised society in which one man's excreta will not be another man's headload. Dr. Pathak says gender is largely a social and political definition

and, hence, it can be altered. On that status, depends the growth of society.

Since most scavengers are women, Dr. Pathak has designed special education and training programmes (learning by doing) for them, in a firm belief that mankind owes to women all that is best and beautiful in our civilisation. He says that if a free society cannot help the poor, who are many, it cannot save the rich, who are a few. He has always believed that there is nothing finer than being born an Indian in a multi-faceted cultural society, which despite its in-built social prejudices, has been a guiding light of the ancient world, where religions like Hinduism, Islam, Sikhism, and Christianity have flourished together. Although Dr. Pathak is not a historian but, he has a strong sense of history, alive at all points and gifted with the faculty of living intensely and with a sense of mission every moment of his life.

BETWEEN TWO WORLDS

Sulabh is a *wave of the future* about which Dr. Pathak says: "*Let the tide run free.*" The difference between a social reformer and a politician is the ability of the former to distinguish between the surface wave and the deep tide; between the wave of the moment and the wave of the future. Dr. Pathak is a loner although living in the midst of multitude. His attitude towards life, wealth and power is that of total resignation, although he has all the three in adequate measure to make any ordinary man arrogant, self-righteous and overbearing. He loves God and religion but listens to those who deny them. His benign smile makes him look like a man next door, doing the daily household work like reaching children to school, buying vegetables and quarrelling with wife over broken cups. He punishes people by forgiving them. And, this hurts more than any other punishment.

He is sometimes criticised because he has called for the changes that propose to reduce power, status and influence of those who have profited from *Old Order*. Dr. Pathak is a realist in means but idealist in end. However, he is never devious, guileful, evasive, dissembling or ruthless. Even in most difficult periods of his career, he never ceased to be a good and cultured man. He condemns Brahminism, but radiates the Brahminical virtues, like the habit of speaking truth, philanthropy, morning prayer, indifference to wealth and encouraging people to respect all religions



Dr. Pathak with sons and daughters of liberated scavengers during training at Patna

which, he says, preach good things of life. Dr. Pathak is a man in hurry. He keeps shifting his furniture, offices and house which indicate that he is not at peace with himself, always seeking for the ultimate good. His success mystified even himself; it happened without driving ambition but with lots of hard work and good luck. Supported by good workers and a loving family, there is very little for him to do except doggedly march to his destiny. What keeps him going is the determination to succeed where others failed.

Dr. Pathak has lived dangerously – always challenging customs, questioning values and interpreting the religion differently, saying that the best of Hinduism is lost in rites, rituals, questionable beliefs and practices. However, he did not favour a new religion, but only a re-birth (*renaissance*) of the same. He is not a revolutionary but a reformer with passion for social justice. He has re-discovered Hinduism by putting it in right perspective if only to say that untouchability has no moral or religious legitimacy and those who practise it commit sacrilege. Man matures faster in poverty and war; he had poverty in ample measure; war, yes, although of a different kind. There was no enemy to defeat but only friends – and a lot of them – to win over to his thinking which is a tough job no less.

Dr. Pathak carries the burden of eminence with ease. No wonder he has the problem of saying 'no' to anyone seeking favour. This is his temperamental problem which costs him not only money, time

and embarrassment, but also sometimes structural problems in the system. This was his habit when he had no money and he borrowed from his friends or sold his wife's gold to help others in times of need. Taking tough decisions is also his problem even in cases where wrongdoing is proven beyond doubt. He believes that to be good is natural for man and if somebody is not so, let us find out the causes - poverty, bad company, bad habits or sheer obsession to destroy the system. In case of the latter, he is ruthless but in other cases he gives the benefit of the doubt to the concerned person. He allows mistakes to be committed freely. Otherwise, he says, people will tend to do what is easy, traditional and will not produce work that is innovative, ingenious, exciting and brilliant. He is an incorrigible optimist and positivist who always sees the glass half full. And, he says that those who cannot deliver the goods, blame the system, the Government leaders or just bad weather.

To be true, his life is a triumph of vision over inward looking habits; of hope over fear and of tomorrow over today. A life rich in achievements has blazed trails, rivalled only by those whose names are graven in stone. He has proved that in modern India, pedigree



A born leader

(rajas, maharajas etc.) does not work; it is performance all the way. How else could an errand village boy from Vaishali acquire global eminence. And, a very dazzling one at that!

Einstein says as you move fast, time slows down. Sulabh cannot be riding on the fictional time-machine but the success of its attitude-building campaign is opening out new possibilities as limitless as the sky which is there for the taking. What was fantasy till yesterday is becoming a reality today. It is true of science (like space travel) and truer still of social relationship (like liberation of scavengers) which is being re-interpreted to shed the ancient ways of living and

thinking. This is the *new wave*, in the making of which Sulabh has a hand, however modest, however invisible. And, the Sulabh Founder is leading this campaign all the way. We know that wherever the pioneer goes, others follow because leadership makes the difference. Scavenging is beyond technology; it is also a question of leadership.

A HISTORICAL QUESTION

Scavenging is a historical question which cannot be settled by law or reservation alone. History has an analogy. When the slaves were emancipated immediately after the Civil War in the United States in the mid-eighteenth century, instead of rejoicing at the freedom, these slaves went up to the Yankee commanders of the regions in which they lived and pleaded to be sent back to slavery in the cotton plantations. "Who will look after us? Who will feed us? Who will protect us?" Who will beat us? And, who will love us?" They pleaded. No wonder, it took one hundred years and a Martin Luther King Jr. for slaves to eventually win back their civil rights and help them learn to live independently. Martin Luther King Jr. was a Gandhian and, like Gandhi, he was assassinated in 1968.

Thomas Jefferson, third US President (1801) and the one who had wrote the American Constitution, had a son from a slave girl, *Salley Hemings*. (It is now proved conclusively after genetic testing as reported by the journal, *Nature*, in October 1998). Jefferson was a widower whose son, *Eston*, from Salley at his Monticello estate in Virginia, commanded great respect among Americans. This relation has been interpreted by Americans not as the sexual misconduct of a public man of great eminence but an act of social integration and acceptance of black people into the mainstream of social life.

Slavery was so intricately woven into the American way of life that both, Black and White, had learnt to live with this inequality. Similarly, scavengers, over the centuries, have learnt to live with indignity and humiliation of manually cleaning and carrying human excreta. Many scavengers, liberated by Sulabh, returned to scavenging where their families, history, memories of childhood and youth lived on. Like American slaves, scavengers sought protection, jobs, beating and "love" amid scavengers until, like Martin Luther King Jr., Dr. Pathak appeared on the scene to

provide a strong leadership that has made a difference in their lives. And, after 30 years, scavengers are beginning to learn to live independently through a process set in by the Sulabh *social upgradation* and *social adoption* programmes.

Dr. Pathak is a born leader; if he were not the Sulabh Founder, he would have been a pioneer in any other field of human endeavour. The defining qualities of a leader, like the ability to reconcile conflicting interests, inspire confidence, articulate views effectively, robust common sense, knowledge of people's habits, cultural preferences, folklore, compassion, patriotism etc., are found in him in abundant measure. And, in times of crisis, he stands like a Colossus – unmoved, unshaken and sometimes alone like Casabianca on the burning deck – in full majesty and defiance! He says with the Biblical ring: "Time is turning; which means you have to break old habits and barriers, abolish Old Order, define new social relationships, find new frontiers, dream new dreams and re-interpret history to create a new social order in which one man's excreta is not another man's headload."

No wonder there is a mystical aura about him, also because he is a complex character – the more one tries to understand him, the more un-understandable he becomes. He is an enigma wrapped in mystery, many times over. But, this is the stuff great lives are made of – at once, awesome and fascinating. What a man, what a career!! ●



Dr. Bindeshwar Pathak receiving Padma Bhushan from the then President, Mr. R. Venkataraman, on March 23, 1991 at Rashtrapati Bhavan for his social services

AWARDS AND HONOURS CONFERRED ON DR. BINDESHWAR PATHAK

- | | | |
|-----|---|---------|
| 1. | K.P. Goenka Memorial Award | 1984 |
| 2. | Prabandhak Mahan Muzzaffarpur | 1990 |
| 3. | Builders Information Bureau Award | 1990 |
| 4. | Civic Betterment Award, Bombay | 1990-91 |
| 5. | National Citizens Award | 1991 |
| 6. | Padma Bhushan | 1991 |
| 7. | The International Saint Prize for the Environment "Canticle of All Creatures", Assisi, Italy | 1992 |
| 8. | Dr. Pinnamaneni and Smt. Seethadevi Foundation Award, Vijayawada, Andhra Pradesh | 1992 |
| 9. | Bombay Citizen's Award | 1992 |
| 10. | Shahid Bhup Singh Award for Social Work, New Delhi | 1992 |
| 11. | Rotary International Spectra-93, Par Excellence Award for Protection of Environment | 1993 |

| | | |
|-----|--|------|
| 12. | Ratna Shiromani Award given by India International Society for Unity | 1993 |
| 13. | Indira Gandhi Priyadarshini Award | 1994 |
| 14. | NRI Gold Award | 1994 |
| 15. | Manav Sewa Puraskar | 1995 |
| 16. | Vikas Ratna Award | 1995 |
| 17. | Limca Book of Records Man of the Year Award | 1995 |
| 18. | Babu Jagjivan Ram Awards for abolishing scavenging | 1997 |
| 19. | Michael Madhusudan Dutt Award | 1997 |
| 20. | Distinguished Leadership Award | 1997 |

IMPORTANT NATIONAL CONFERENCES AND SEMINARS ATTENDED AND ORGANISED BY DR. BINDESHWAR PATHAK

- *Conversion of Bucket Privies into Sanitary-seal Latrines* - Report on a National Seminar, convened by the Government of India in collaboration with WHO and UNICEF, Patna, 25-27 May, 1978.
- *Regional Conference on Low-Cost Pour-flush Latrines* - sponsored by the Government of India/UNDP at Udaipur and Udhagamandalam, (Ooty) during August-October, 1982.
- *National Conference on Low Cost Sanitation* - Sponsored by the Government of India in collaboration with UNDP, New Delhi, May 19-20, 1984.
- *Seminar on Bio-gas from Human Excreta* - A State Level Seminar convened by Sulabh Institute of Technical Research and Development, Sulabh International, Patna, Bihar on 26-27 November, 1984.
- *Seminar on Low-Cost Sanitation to Eradicate Scavenging and Rehabilitation* - organised by Urban Development Department, Government of Uttar Pradesh in collaboration with Housing and Urban Development Corporation, Government of India and Sulabh International at Lucknow (U.P.), January, 1987.
- *First National Conference on Rural and Urban Water and Waste Water Management* organised by Institution of Public Health Engineers (India), Delhi Centre, on 16-18 April, 1987.
- *Rural Sanitation and Health* - Lecture delivered at Lal Bahadur Shastri National Academy of Administration, Mussoorie on July 2, 1987.

- *Asian Regional Workshop on Solar Energy Utilization and Power Generation* - September 9-11, 1987.
- *All India Seminar on Operation and Maintenance of Urban Water Supply and Sewerage Services, Desirability of Adopting Low-Cost Sanitation*, September 15-17, 1987.
- *Regional Workshop on Housing Actions Shelter in Asia and the Pacific - Experiences in Low-Cost Sanitation* - September 19-22, 1987.
- *Scavenging Free Scheme for Four Towns of Arunachal Pradesh*, prepared by Sulabh International, February, 1988.
- *National Seminar and Exhibition* on the occasion of visit of Mr. S.G. Pitroda, April 11, 1988.
- *Seminar on Strategic Action for Health and Sanitation in Delhi*, organised by Sulabh International, New Delhi, October 12, 1988.
- *Seminar on Low-Cost Sanitation*, at Madras, October 25-26, 1988.
- *International Conference of Association of South-Central-West Asia Countries* - Indian Water Works Association, New Delhi, November 21-24, 1988.
- *Views on Integrated Scheme of the Liberation of Scavengers and Improvement in Sanitation Guidelines*, circulated by HUDCO, New Delhi, September, 1989.
- *Two-Day Workshop on Evaluative Methods Applied in Sanitation Sector* - India International Centre, New Delhi, May 23-24, 1989.
- *Task Force on the Problems of Scavengers - Preliminary Thoughts on the Issues*, August 1, 1989.
- *Indian Society of Health Administrators - State Level Conference on Health of the Metropolis*, Bangalore, September 8-9, 1989.
- *Second Conference on Building Industry*, Hotel Meridian, September 21, 1989.
- *Sulabh International Pioneer in Scavenging Eradication* - February 21, 1990.
- *Low-Cost Sanitation* - August, 1990.
- *Environment and Human Waste*, September, 1990.
- *Health and Sanitation with Special Reference to Excreta Disposal in Rural Areas*, October 15, 1990.
- *Environment and Human Waste*, September, 1990.
- *Sulabh International - Objectives, Activities and Achievements*, September, 1990.
- *Training Proposals for Bihar State Under Nehru Rozgar Yozna - Housing and Shelter Upgradation Scheme*, December, 1990.

- *Sulabh Shauchalaya and Sulabh Complexes*, January, 1991.
- *Approaches and Strategies for Rural Sanitation in 1990s*, January, 1991.
- *Sulabh Shauchalaya and Sulabh Complexes*, IIT, February 2, 1991.
- *Programme for Eradication of Scavenging*, May 7, 1991.
- *Programme of Eradication of Scavenging*, August 27, 1991.
- *Training and Rehabilitation of Divorced Women*, Pusa District Yeotmal, Maharashtra, August, 1991.
- *Basic Sanitation in the Context of Rapid Urbanisation - Drinking Water and Sanitation Issues from the Third World Perspective*, New Delhi on November 14-16, 1991.
- *Second Congress of Toxicology in Developing Countries - Health and Sanitation* on November 24-28, 1991.
- *Lok Swaraj Sansad - New Delhi Sulabh Experiences in Social Reform and Development* on December 7-9, 1991.
- *Institution of Public Health Engineers (India) - Sixteenth National Convention on Environmental Engineering*, Shantiniketan, West Bengal, February 21-23, 1992.
- *Self-Managed Institution for Integral Development*, April, 1992.
- *Workshop on Design, Technology and Process for Primary School Building* - organised by Ministry of Human Resource Development, Government of India, Delhi, April 11, 1992.
- *Seminar on Environmental Protection and Developing Countries - Prevention of Environmental Pollution and Enteric Diseases at Delhi - through Low-Cost Sanitation*, May 12, 1992.
- *National Training Course on Energy for Rural Development* - organised by Centre for Integrated Rural Energy Planning, Bakoli, Alipur, Delhi, May 25-30, 1992.
- *NGOs Workshop on UNCED Conference - Improvement in the Quality of Life and Human Health through Low-Cost Sanitation*, New Delhi, May 11-12, 1992.
- *Seminar on Environmental Protection and Developing Countries - Prevention of Environmental Pollution and Enteric Diseases through Low-Cost Sanitation*, May 12, 1992.
- *Seminar on Make the Earth a Source and Hospitable Home* - organised by Indian Federation of United Nations Associations, New Delhi, June 5, 1992.
- *Training and Rehabilitation of Liberated Scavengers and their Wards in Delhi and Adjoining Areas* at New Delhi, June, 1992.

- *Two-Day Workshop on Provision of Sulabh Shauchalaya in Delhi Homes* - organised by Sulabh International, June 20-21, 1992.
- *Proposals for Immediate Implantation of the Facilities for the Training and Rehabilitation of Liberated Scavengers and Their Wards in Delhi and Adjoining Areas*, August, 1992.
- *National Seminar on the Political System - Social Diversities - Nation Formation and the Constitution* at India International Centre, New Delhi, August 28-29, 1992.
- *Workshop on Media Mass Communication and Environment*, Patna, September, 1992.
- *Press Conference* at India International Centre, New Delhi on October 30, 1992.
- *Follow-up Workshop on Earth Summit*, New Delhi, November 13-14, 1992.
- *Dr. Pinnamaneni and Smt. Seethadevi Foundation - Speech on Social Reforms*, December 16, 1992.
- *Seminar on Social Justice Equality and Movements of Emancipation: Role and Respective of Dr. B.R. Ambedkar (1891-1956)*, at Agra Institute of Social Service, Agra on December 22-23, 1992.
- *Save Earth Seminars 1993*, Patna, February 12-21, 1993.
- *State Level Workshop on Sanitation* organised jointly by Madhya Pradesh, PHE Department and UNICEF, Bhopal, October 5-6, 1993.
- *Seminar on Secularism, Precept and Practice* at Patna on November 7, 1993.
- *Meeting of Experts on Biogas from Human Waste* - Institution of Engineers (India), Bahadurshah Zafar Marg, New Delhi, November 8, 1993.
- *Integrated Development for Improving the Family Life in Rural Uttar Pradesh*, organised by Government of U.P. at Lucknow on December 21-22, 1993.
- *Seminar on Basic Constructional Values and Their Implementation* at India International Centre, New Delhi on January 8, 1994.
- *Water, Sanitation and Diarrhoea Control* at Patna on January 15, 1994.
- *Regional Seminar on Partnership in Municipal Infrastructure Services*, New Delhi, February 7-11, 1994.
- *Society for International Development, Patna Chapter - Eradication of Scavenging and Environmental Sanitation*, March 24, 1994.
- *International Conference in Shaping the Future by Law: Children, Environment and Human Health*, organised by The Indian Law

Institute, Delhi, March 21-25, 1994.

- *International Conference on Shaping the Children by Law: Improvement in the Quality of Life*, New Delhi, April 30, 1994.
- *National Seminar on Rural Development and its Impact on Environment* - organised by Rural Youth Coordination, Amnour, Saran (Bihar), June 5, 1994.
- *Seminar on Himalayan Conservation Programme - Governments - People Participation*, at Vigyan Bhawan, New Delhi and *Toilets in Gangotri Belt in Himalayan Region*, organised by Himalayan Environment Trust with Support of the Ministry of Environment and Forests, Government of India, June 27-28, 1994.
- *Training Programme on Planning and Management of Urban Services*, organised by National Institute of Urban Affairs, New Delhi - Low-Cost Sanitation - Sponsored by the Department of Personal and Training, Government of India, August 8-13, 1994.
- *All India Maithili Conference* at Darbhanga (Bihar) - Prospects of Scientific and Technical Development, Mithila, October, 1994.
- *The First National Conservation Congress* - organised by The World Wide Fund for Nature India, New Delhi on November 21-23, 1994.
- *National Convention on Environment of India* - Challenges for the 21st Century - organised by IPHE (India), Calcutta, November 23-25, 1994.
- *United Nations Conference on Human Settlements (Habitat II) Zonal Consultation of NGOs/CBOs of Eastern Region* - hosted by Sulabh International Social Service Organisation, Patna, December 3-4, 1994.
- *International Seminar on Disasters, Environment and Development*, organised by The IGU Study Group on Development Issues in Marginal Regions in Collaboration with U.N. IDNDR Secretariat and other Agencies, Delhi, December 9-12, 1994.
- *World Congress on Vocationalisation of Environmental Congress* at India International Centre, New Delhi, December 17-19, 1994.
- *Seminar on Professionalisation of Environmental Management* - World Congress on Vocationalisation of Environmental Congress at India International Centre, New Delhi, December 17-19, 1994.
- *National Conference of NGOs on Integrated Development - Innovative Approaches*, organised by - Consortium for Voluntary Action, New Delhi, January 22-23, 1995.
- *Government and Non-Government Organisation Partnership in Integrated Urban Infrastructure Development*, New Delhi, February 2, 1995.

- *Seminar on Integrated Urban Infrastructure Development*, organised by the Human Settlements Programme, New Delhi, February 1-4, 1995.
- *Seminar on Urban Environment*, organised by Centre for Environment Studies School of Planning and Architecture, New Delhi, February 7-10, 1995.
- *XVI National Conference of ISSA on Dimensions of Development*, organised by Department of Sociology Kashi Vidyapeeth, Varanasi, February 10-12, 1995.
- *UNDP Parliamentarians Forum for Human Development Project - on Integration at Parliament Annexe*, New Delhi, February 20, 1995.
- *Third International Conference on Appropriate Waste Management Technologies for Developing Countries*, organised by International Association on Water Quality, London in association with National Environmental Engineering Research Institute, Nagpur, February 25-26, 1995.
- *Interactive Workshop on National Programme on Sanitation and Hygiene on the Lines of A Technology Mission*, organised by Ministry of Health and Family Welfare, Government of India, New Delhi, Need for a Technology Mission for Sanitation, April 10-12, 1995.
- *8th International Congress on Human Settlements in Developing Countries*, organised by Centre for Human Settlement International, Calcutta, May 25-27, 1995.
- *Eighteenth Course on Urban Plan Administration*, organised by Indian Institute of Public Administration, New Delhi, July 17-28, 1995.
- *Symposium on Role of NGOs in the Conservation of Environment*, organised by National Environmental Science Academy, New Delhi, August 19-20, 1995.
- *Seminar on Microbes for Environmental Management*, organised by Association of Microbiologists of India (Delhi Unit II), August 26, 1995.
- *Role of Non Governmental Organisation in Implementation of Urban Sanitation Programme* - organised by Indian Institute of Public Administration, New Delhi, August 26, 1995.
- *Seminar on Microbes for Environmental Management*, JNU, New Delhi, August 29, 1995.
- *Training Programme on Formulation and Financing of Urban Water Supply Projects*, organised by Indian Institute of Public Administration, New Delhi, August 25 to September 8, 1995.
- *National Seminar on Schedule Castes : Problems and Prospects in Agra (U.P.)*, September 23-24, 1995.

- *Seminar on The Engineering Trends in Social Theory*, organised by Gobind Ballabh Pant Social Science Institute, Allahabad, September 29 - 30, 1995.
 - *Acceleration the process of Social Development in Bihar - National Seminar on Development of Bihar*, organised by A.N. Sinha Institute of Social Studies, Patna, November, 9-12, 1995.
 - *National Workshop on Corporate Initiatives in Public Health - Focus: Sewage Disposal and Safe Drinking Water*, organised by Confederation of Indian Industry, New Delhi, November 16, 1995.
 - *Second Congress - Theme: Human Settlement - Problems and Prospects*, organised by Indian Building Congress, New Delhi, December 7-9, 1995.
 - *An Extension Lecture to the Students and Staff of Udaipur School of Social Work - Rajasthan Vidyapeeth, Udaipur*, December 11-12, 1995.
 - *"Women and Empowerment" Paper read in Meeting* organised by USAID on February 2, 1996.
- Key note address at seminar on "The Problems and Rehabilitation of Disabled Women" on March 24, 1996.
- *National Rural Housing Exposition*, organised by India Trade Promotion Organisation at Pragati Maidan, Nov. 15, 1995, Jan. 31, 1996.
 - *29th Annual Conventions of IWWA* at Calcutta, 2-5, 1996,
 - *Seminar on Environmental Quality of Human Settlements*, organised by Centre for Environmental Studies School of Planning and Architecture of New Delhi, Jan. 31 - 2nd Feb., 1996.
 - *Seminar on Education for Achievements of Sustainable Human Settlements*, organised by Centre for Environmental Studies School of Planning and Architecture at New Delhi, 4-6 Feb., 1996.
 - *Workshop on capacity Building for Urban Environmental Management*, organised by Human settlement Management Institute of New Delhi, Feb. 17-21, 1996.
 - *Meeting of the International Ministerial Convergence Forum (IMCF)* under the Prime Minister's integrated urban poverty Eradication Programme at Nirman Bhawan in New Delhi, Feb. 21, 1996.
 - *National Seminar on Dalit writings, movements & Dynamics of Social Change* at Warrangal, 23-24 February, 1996.
 - *Workshop on HIV, AIDS* at Parliament House Annexe, New Delhi, March 12, 1996.
 - *Working Group on Environment Health Education: IEC* to formulate Policy Guidelines Strategies and programme objective during with

plan (constituted by Planning Commission) meetings on 19.3.96, 3.4.96, 10.5.96 & 30.5.96.

- *Seminar on Healthy cities for better life: Planning, participation and partnership*, organised by National Institute of Urban Affairs, New Delhi in collaboration with WHO at IIC, April 4, 1996.
- *Women's Political Empowerment Day celebrations Conference* organised by The Institute of Social Sciences at New Delhi, April 24, 1996.
- *DDA-HUDCO workshop on Decentralised Approach for urban services* at Vigyan Bhawan, 25-26 July, 1996.
- *All India Seminar on "Challenging Problems in Environmental Management (CPEM 96)"* 12-14 Sept., 1996. (organised by Nagpur Local centre of the institute of Engineers at Nagpur)
- *Seminar on Solid waste management: Developing Countries perspective Need for Development of waste Management Industry in India* - organised by National Council of Development communication, New Delhi, Sept 28, 1996.
- *All India Women's Educational Fund Association (AIWEFA) Seminar* on 3-5 October, 1996.
- *National Housing Seminar "Adequate Shelter for All"*, organised by Ministry of Urban Affairs and Employment, New Delhi at Vigyan Bhawan, 7-9 October, 1996.
- *Capacity Building on day workshop on cities at Risk International Day for Natural Reduction* at Haryana Institute of Public Administration, Gurgaon, October 9, 1996.
- *Technology Summit 96* - 11-12 Oct. 1996. Technology Platform 96, 10-12 Oct. 1996. Jointly organised by confederation of Indian Industry and IMTMA at Hyderabad.
- *XIXth Annual conference of Indian Society of Gandhian Studies*, organised by Rani Durgawati University at Jabalpur, 16-18 Oct. 1996.
- *National Symposium on Youth: Sanitation and Environment*, sponsored by Department of youth Affairs and sports Ministry of Human Resources Development, Govt. of India
- *Meeting of National Steering Committee* on Habitat-II, Nov. 21, 1996.
- *Seminar on Sub-Standard HABITATS in Delhi* Organised by PHD Chamber of Commerce and Industry and Government of NCT of Delhi, Dec. 13, 1996.
- *Prime Minister's Integrated Urban Poverty Eradication Programme* First Meeting of the International Ministerial Convergence Forum at Nirman Bhawan, Feb. 21, 1997.

- *Consultation on National Rejuvenation through Democratic Restructuring* at Parliament annexe organised by Lal Bahadur Shastri Memorud Foundation, March 8, 1997.
- *National Conference on Strategic & Human Management A Vision for 2002*, Ashok Hotel, New Delhi, 19-20 March, 1997.
- *Symposium*, organised by Development Research Group at Parliament House Annexe, New Delhi on World Water Day, March 22, 1997.
- *National Seminar on Lokpal Legislation*, organised by Citizenship Development Society at Indian International Centre, New Delhi, March 30, 1997.

IMPORTANT INTERNATIONAL CONFERENCES AND SEMINARS ATTENDED BY DR. PATHAK

Dr. Pathak and experts of Sulabh International Social Service Organisation have visited a number of countries to study the problems relating to sanitation particularly disposal of human excreta with a view to adopting their innovative technologies and systems in reference to socio-cultural and economic background of India. On the invitation of the Chinese Government, and National Swedish Institute for Building Research a team of senior engineers of Sulabh International and representatives of All India Institute of Hygiene and Public Health, Calcutta led by Dr. Pathak visited China in 1987 to study the sanitation technology being adopted there, and Sweden in July, 1989 to study the research work being carried out there on low cost sanitation options (including small more sewer, cleaning of leach pits mechanically and low volume flushing water closet).

Dr. Pathak visited Karachi (Pakistan) in December, 1990 at the invitation of the Food and Agricultural Organisation to study viability of the Orangi Project conceived on self-help basis. Sponsored by UNICEF, Dr. Pathak visited Oslo (Norway) to attend the Global Forum of Collaborative Council Meeting on Water Supply and Sanitation in September 1991 and again at Morocco in September, 1993.

International Association for Energy Economics invited Dr. Pathak to participate in the 16th Annual International Conference at Bali during July 1993. On being nominated by the Government of India, Dr. Pathak attended International conference on "Partnership for change", organised by the UK Government during September, 1993. On invitation from Colorado State University, USA, Dr. Pathak delivered the keynote address and also read a paper at the International Conference on Village Based Development in September, 1993. Being invited by the

Vice President of the World Bank, Dr. Pathak attended the First Annual International Conference on Environmentally sustainable Development in September-October, 1993 at Washington D.C.

Dr. Pathak has also visited UK, Japan, Bangkok (Thailand), Indonesia, Sri Lanka, Bangladesh, Nepal and Spain at the request of UNICEF, UNDP, World Bank, etc. to attend seminars, conferences or to advise Governments on low-cost sanitation.

- *International Seminar on lowcost techiques for Disposal of Human Waste in Urban Communities*, sponsored by the UNDP Global Project on Low-Cost Water Supply and Sanitation UNICEF, India and the Government of India in association with The Institution of Engineers (India) on the occasion of the Diamond Jubilee at Calcutta, February, 1980.
- *International Seminar on Adhoc Session on 'Action Sociology'* at the XII World Congress of Sociology, Madrid, Spain, July 1990.
- *International Drinking Water Supply and Sanitation Decade, The Global Consultation on Safe Water and Sanitation for the 1990s*, New Delhi, September 10-14, 1990.
- *Global Collaborative Council Meeting for Water Supply and Sanitation*, Oslo, Norway on September 18-20, 1991.
- *Regional Consultation on Hygiene and Sanitation Promotion* at WHO, New Delhi, May 19-21, 1993.
- *Water Supply and Sanitation Collaborative Council Meeting (WSSCC)* at Rabat, Morocco on September 7-10, 1993
- *Global forum on Environmental Development Education*, organised by Indian Environmental Society under the Sponsorship of UNESCO, September 24-28, 1993.
- *International Conference on Sustainable Village-Based Development*, Colorado State University, USA, Department of Civil Engineering on September 26 to October 1, 1993.
- *Seminar on Partnership for Change, Manchester*, September, 20-22, 1993
- *Seminar on Sulabh's Low-Cost Sanitation Work in South Asia* at Canada on September 22-24, 1993
- *Environmentally Sustainable Development, Washington D.C.* called by World Bank on September 30 to October 1st, 1993.
- *The Asian Conference on Diarrhoeal Diseases, Dhaka*, hosted by Bangladesh Medical Association, September 17-19, 1994.
- *Report of the Second Meeting - Working Group on Promotion of Sanitation - Water Supply and Sanitation Collaborative Council*,

Switzerland, October 3-5, 1994.

- *Workshop on Regional Cooperation in the Management of Social and Hazardous Works in Developing Countries* at Taipei, Taiwan, convened by Pacific Basic Research Centre Harvard University, January 13-14, 1995.
- *Seminar on NGO Forum '95* - Copenhagen, Denmark, March 3-12, 1995.
- *HUDCO MISSION to South Africa*, March 13-29, 1995.
- *Collaborative Council meeting of the Working Group on the Promotion of Sanitation* - Geneva, Switzerland, April 28 to May 3, 1995.
- *International Symposium on Public Toilets 1995*, organised by Urban Council, Hong Kong, May 25-27, 1995.
- *NGO Forum on the World Summit for Social Development*, Helsinki, organised by The International Council on Social Welfare Montreal, Quebec, H2Y 3X7 Canada - Social Integration Experiment and Experiences of a Non-Governmental Organisation in India, July 7-9, 1994.
- *World Summit for Social Development: What After Copenhagen*, May 9, 1995
- *Water Supply and Sanitation Collaborative Council - Third Global Forum* in Barbados, October 30, to November 3, 1995.
- *Dubai International Conference on Best Practices*, November 19-22, 1995.
- *International Conference at Kota Rajasthan*, organised by Bharat Vikas Parishad, New Delhi, 30-31 December, 1995.
- *Dubai International Conference on Best Practices in Improving Living Environments*, November 19-22, 1995 organised by the UNCHS, Habitat-II.
- *City Summit, Habitat II conference at Istanbul* organised by the UNCHS, June 3-10, 1996.
- *22nd WEDC conference - Reaching the unreached challenges for the 21st century*, 9-13, September, 1996.
- *Meeting of General Assembly of the UN on Habitat Agenda*, October 29-30, 1996.
- *Outline of National capacity Building Strategies for Urban Environmental Management*-organised by HSMI, New Delhi and Institute for Housing and Urban Development Studies, Rotterdam, 1st January, 1996.
- *Meeting at USAID to discuss issues Concerning Women's Leadership and Advocacy, Literacy Credit and Enterprise and Environmental*

- Health at Qutab Institutional Area, New Delhi, 8 February, 1996.*
- *International conference on Environmental Strategies for Asian Cities, organised by United Nations Centre for Human Settlements with Madras Metropolitan Development Authority and Govt. of Tamil Nadu at Madras, 14-17 February, 1996.*
 - *Third International Conference on Environmental Planning and Management, organised by Visevesvaraya Regional College of Engineering, Nagpur, 24-26 February, 1996.*
 - *International Conference on promotion of Environmentally Sound and healthy cities, organised by Department of Geography, Delhi School of Economics, University of Delhi at New Delhi, 12-14 March, 1997.*
 - *United Nations Conference on Human Settlement, Istanbul, Turkey, 3-14 June, 1996.*
 - *The 27th ICSW International conference on "Role of Non Governmental Organisations in Transitional Societies (1) at convention and Exhibition Centre, Hong Kong, July 23 - August 3, 1996.*
 - *Consultative Status with the Economic and Social Council of United Nations, 26-30 August, 1996.*
 - *22nd WEDC Conference on Reaching the Unreached Challenge for the 21st century, organised by Water, Engineering and Development Centre, Loughborough University of Technology, England in collaborations with the Institute of Public Health Engineers, India. Supported by Sulabh International Social Service Organisation at New Delhi, 9-13 September, 1996.*
 - *United Nations Conference on Human Settlement (Habitat-II) at New York on 29-30 October, 1996.*
 - *Interactive Seminar with FOCUS on Issues that need Attention, organised by SERCON CE & C, 30-31 January, 1997.*
 - *Water Supply & Sanitation - Collaborative Council Forth Global Forum, Manila, Philippines, 3-7 November, 1997.*
 - *Water Supply & Sanitation Collaborative Council - Vision 2001: People Water Supply & Sanitation at Hague, Netherlands, March 24, 1998*
 - *International Healthy Cities Conference, from June 20-23, 1998 at Athens, Greece.*

What they say about Sulabh

"Untouchables gain the help of a Brahmin."

- *The New York Times*

"The most successful of the voluntary scavenger emancipation enterprises has been the Sulabh Shauchalaya Sansthan which has started something of a mini-revolution in Indian sanitation planning by using entrepreneurial business practices, modern technology and aggressive marketing methods."

- *The Washington Post*

"A Brahmin has associated himself with menial work which shows that there a revolution in the making."

- *Frankfurter*

"Dr. Pathak has made it his aim in life to free scavengers from drudgery."

- *Globe and Mail*

"Dr. Bindeshwar Pathak is a great redeemer."

- *The Hindustan Times*

"Dr. Pathak won't find relief until all his countrymen do loo in private."

- *Far-Eastern Economic Review*

"I will like to congratulate Dr. Bindeshwar Pathak who fully deserves this coveted recognition." (St. Francis Award)

- *His Holiness Pope John Paul-II*

"I read with great sympathy your account of the situation of the scavenger community and I congratulate you on the work which you are doing on its behalf. I am sure your International Saint Francis Prize for the Environment was richly deserved."

- *Mr. Boutros Boutros - Ghali,*

Former Secretary-General of the United Nations