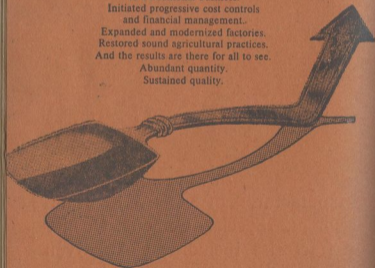


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Churn on diligently

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Chairman

Nanaji Deshmukh

Editor & Publisher

K.R. Malkani

Deendayal Research Institute

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Dear Readers :

Namaste !

Please see in this issue the article, "Resolving Religio-Cultural Differences in the Service of the Indian People". Copies of this Paper were earlier circulated to over a hundred leaders of thought for their comments—and suggestions. Many of them have done so already. Shri Asghar Ali Engineer wrote in the course of his article "Lessons of Behrampur" (The Indian Express, July 7).

"To my pleasant surprise Mr. K.R. Malkani of Deendayal Upadhyaya Research Institute has prepared a draft document for dialogue with Muslims. This draft document, I must say, is remarkably balanced and certainly can become a basis of dialogue with the brothers of the majority community. Some representative organisation of Muslims should also prepare a similar draft document for dialogue with Hindus. There is sufficient basis in Islamic theology for such an approach. The Institute of Islamic Studies is certainly ready to prepare such a draft document for dialogue."

You are also welcome to send us your comments—and suggestions for action.

The article "The Philosophy and Technology of Living in Tune with Nature" by our Shri Sailendra Nath Ghosh has been simultaneously published in the Vivekananda Kendra Patrika. You will find it highly educative.

And then there is Dr. J.D. Sethi's 'Some Gandhian elements in Gorbachev's Vision', first published in 'Patriot' (June 21-22). Here are insights which could help resolve the world's biggest problems.

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**Resolving Religio-Cultural Differences
in the service of the Indian People**

K. R. MALKANI

THE COMMUNAL/RELIGIOUS problem in India has gone on for long. And it threatens to go on and on. At one stage it was hoped that Partition would solve the problem. But it has not. It has only duplicated it—and further complicated it. What was formerly a Hindu-Muslim issue, is now, additionally, an Indo-Pak problem.

Here is a problem that not only leads to social tensions and social violence, it retards the country's progress in every way. This is a problem that must be solved—and it can be solved in the light of our own and other countries' historic experience.

It is, therefore, of the utmost importance to analyse the nature of the problem—whether it is religious, political or what—and to find the right set of remedies for it.

These remedies have to be inspired by love and understanding. This method failed with Gandhiji only because, at that time, the third party was there to sabotage it.

The agitation for partition—and the partition itself—created so much heat and hatred that the method of love could not be tried for years. But now, forty years after partition—with the people of Pakistan themselves in a very different mood—it is about time to think coolly and devise ways and means of forging a just and abiding solution of this old and vexed problem.

Although men of religion may or may not directly involve themselves in development work, there is no doubt that a clearer understanding, and a wiser handling, of the problem, will create a harmonious national atmosphere, in which the country could progress faster and better in all spheres.

1. MODERN ATTACKS ON RELIGION

In modern educated India it has long been a fashion to run down religion. It is assumed that religion is superstitious and backward-looking. All political disputes, old or new, in the name of religion, are debited to Religion—and not to Politics! In this theatre of the absurd, while secularism has been installed as the new religion of official India, Religion

itself has been relegated to the background as some kind of a necessary evil. Nobody has anything against secularism—if it means Justice For All, and non-discrimination on grounds of creed or religion, etc. But to treat secularism as a substitute for religion—or as white-wash for communalism is to wholly misunderstand the nature, scope and function of both, religion and secularism.

This official ridiculing of religion has an Indo-European history behind it. In Europe, the local princes had resented the primacy of the Pope even in matters political, as if he was heir and successor to the Roman Empire. And the town traders had resented the various tithes of the Church. As a result, the two had combined to put Church-men in their place and usher in the Reformation, under the leadership of Martin Luther. In the process, religion itself had been challenged and ridiculed. All this attack on Religion was mechanically adopted by educated India, even though it had no relevance to the Indian scene. Neither Hinduism nor Islam was an organised Church like Roman Catholicism. The tyranny in India came from the political tyrant (who may, occasionally, and hypocritically, invoke religion) and not from a tyrannical head of Hinduism or Islam; such a head simply did not exist in the two religions. Indian Islam knew Maulvis and Maulanas, but no Caliph. And even the Caliph in Turkey was Sultan only of Turkey; he had no political role in other Muslim countries—and only a nominal religious role in the Muslim world. Caliphs were kicked around by waves of "Muslim" conquerors. The Shankaracharyas etc. of Hindus were, of course, purely religious heads with no role in political or public life.

Another development in the West, which down-graded religion was the by insistence the Church that science must not say or do anything that may disprove theology. (To this day, in the Bible Belt of USA, Darwin's Theory of Evolution is either not taught—or taught only along with the Biblical Theory of genesis of man from Adam and Eve.) If the Church said that the sun went round the earth, scientists were "heretical"—and therefore fit for the 'Inquisition' and the Stake—if they said that it was the earth that went round the sun. By pitting religion against science, the Church brought religion into ridicule in the eyes of the great and growing scientific community.

No such situation existed in India: Hinduism accepted science, much of which seemed only to endorse many Hindu beliefs and concepts. And science vs. religion never became an issue even for Muslims. Indeed science had thrived very well for centuries in Muslim lands from Syria to Spain. But the rootless Indian intelligentsia mechanically adopted Western scientific criticism of religion—and applied it to the religious communities in India!

On top of this came the foreign missionary attacks on Hinduism. Since the ruler's religion acquires a certain special prestige in the eyes of a subject people, Christian missionary attacks on Hinduism came to be accepted by this same rootless intelligentsia as more or less true. And so we had Keshub Chandra Sen of the Brahmo Samaj saying: "The Bride-groom (Jesus) is coming!" In China Sun Yat-sen and Chiang Kai-shek actually embraced Christianity.

These missionaries found it possible to attack Hindu religious thought and practices because Hinduism accepts the principle of freedom of religious thought. They did not dare to attack Islam, because Muslims believed their religion to be final and perfect, and they would not have hesitated to liquidate the critics of Islam, as per Islamic injunctions.

Some Hindus actually embraced Christianity; and many came to adopt a defensive and shame-faced approach to their own religion. And then came the political disputes—in the name of religion. Politicians are notorious for their cleverness. These gentlemen made it appear as if these disputes were due to religious differences—and not due to the politics of politicians and the general avarice of man. Even during Muslim rule, the fight was between oppressors and oppressed, and not between Muslim Pirs and Hindu Saints. The typical Indian approach was simply, but adequately, expressed by Kabir when he said: "Kashi Qaaba Ek Hai... Bhaj Man Ram Rahim." More recently, the demand for Partition of India came chiefly from Aligarh Boys, old and new, and not from the Ulema or the Pirs.

All these factors combined to put Religion in the dock in the eyes of these English-educated "Macaulayans". But religion was no kind of a dog to be given a bad name and hanged. On the other hand it had reached the heights of philosophy when, it said that, "in the eyes of the Seer, the Brahmin, the cow, the elephant and the dog are all the same," different expressions of Brahma (Gita-5:18). And although the mass of the people could not articulate their defence of religion in the modern idiom, for the satisfaction of our Macaulayan secularists, they knew the importance of Religion in their lives. They believed in Religion—and religion saved them. 'Dharmo Rakshati Rakshitah', Dharma protects those who defend it.

2. THE ABSOLUTE IMPORTANCE OF RELIGION

Dharma literally means 'that which holds (everything) together', 'dhr'. And religion, 'relegere' in Latin, likewise means 'to bind together anew'. So the people clung to their religion as a child clings to the mother. In this situation, even the high-priests of secularism had to come to terms with religion—if they wanted the people's votes. And so Jawaharlal invariably attended the Kumbh Mela; Indira was demonstratively religious; and even Rajiv displays an over-size tilak.

However, Religion is something much more than a politician's convenience. Gibbon was being smart, but hardly profound, when he wrote that all gods are true for the populace, all gods are false for the philosophers and all gods are necessary for the magistrates. Gods are not just magistrates' policemen—to help maintain law and order and public morals, through fear of God's wrath. Fact is that Dharma, a 'just and moral order', is the very soul of civilization. It is rooted in man's joy and wonder over the mystery of life. Modern science has lighted up the cities and woven many webs round the world; man has landed on the moon. But no science can explain the mystery of life—the unknown and unknowable. The firmament is as much of a mystery as the mind of man. Religion is an attempt at answering the questions that arise in man's mind :

*"Whence are we, and why are we ? Of what scene,
The actors or spectators ?"*

Religion is an attempt at interpreting the universe, the universal mind, and man himself, to mankind. While philosophers are free to speculate whether God created man or man invented God—forgetting that God is both, creator and creation, destroyer and destruction, play and player—fact remains that without the concept of an All-Powerful, All-Merciful, All-Beneficent God, man would go to pieces; he would lose his sanity. In the darkness of the jungle night, in the voids of outer space, and in the trackless paths of the human mind, it is this concept of God as 'Satyam, Shivam, Sundaram'—and Al-Rahman Al-Rahim—that gives man hope and courage, to live and grow, in faith and charity. The English word 'God' is derived from the Gothic 'Guth', which is the same as the Sanskrit 'Huta', which means 'one to whom oblations are made'. Without the concept of God, there would be no concept of civilization, no idea of progress. As Voltaire put it humourously, "If God did not exist, it would be necessary to invent him." That is why Religion is as old as man—as old as civilization. It is not the opium of the people, it is their Amritam. It is the Fruit, Flower, Flavour and Fragrance of Life. People who mock Religion only betray the arrogance of their ignorance. They do not know the role of Religion in the evolution of Man.

Everybody is agreed that man needs to learn the three R's—Reading 'Riting and 'Rithmetic ; but unless man is imbued with the spirit of the Fourth 'R'—Religion—he will not become truly human. The Arabic word for 'insan' means 'friend of all' (*ins* means sympathy). And the Veda says : Mitrasya Chakshusha Pashyem, "Look (upon the whole world) with a friendly eye".

The truly religious man sees God everywhere—in everybody and in everything. In the words of the English poet, he—

*"Finds tongues in trees, books in the running brooks,
"Sermons in stones, and good in everything."*

He sees life steadily and sees it whole. He has an integral and integrating approach to life. The man of religion is at peace with himself and with the world.

As good old Hafiz of Iran said ages ago :

*"Hafiza gar wasl khwahi, sulh kun ba aam-o-khas ;
"Ba Mussalman Allah-Allah, ba Bramin Ram-Ram."*

(Oh Hafiz, if you want to be one with God, make peace with high and low—one and all ; greet the Muslim with 'Allah-Allah' and the Brahmin, that is Hindu, with Ram-Ram.)

3. THE ESSENTIAL UNITY OF ALL RELIGIONS

There is a general impression among Hindus that Islam is not much of a religion—and the Muslims return the compliment. But this just is not true. The Gita says—

*Ahamaatmaa gudaakesha, Sarvabhootashyasthitah,
Ahamaadishcha madiyam cha, bhootaanaamanta eva cha.*

(Gita : 10 : 20)

"I am the self, Gudakesha, seated in the heart of all things ; I am the beginning, the middle and also the end of all beings."

And Koran says the same :

*"Hu-wal-Awwal, Hu-wal-Akhir,
Hu-Waz-Zahir, Hu-Wal-Batin
Wa hu-wa be kulle shayin Alim."*

(He is the first, He is the Last also ;

*He is the outer, He the inner too,
The manifest and yet unmanifest,
The Lord, ordainer, Knower of all things.)*

Islam is not the only religion to say there is one God, Allah. The Veda says : "Ekam Sat; Dutyo Nasti". Allah is not the God of Muslims (Rab-ul-Muslimeen) only; he is Rab-ul-Alimeen, he is the God of all men.

Mohammed says : "All creatures are the Family of God; And he is the most beloved of God, who does most good unto his Family."

*Al-khalqo ayal-Allahi;
fa ahabbul-khalqi il-Allahi
man insana ila a yalihi.*

Hindus are not the only ones to say there are numerous ways to God. The Prophet of Islam says in Hadis : "*At-turqu il-Allahi kan nufusu bani Adam.*" (There are as many ways to God as there are souls; as many, as the breaths of Adam's sons.)

The Koran also says : "There must be no compulsion exercised in matters of religion. Unto you, your faith be welcome; so my faith to me."

*La ekraha f-id-din. La-kum
dinu-kum wale yadim; Udu ela
Sabili Rabbeka b-il-hikmate
W-al-mauzezatiil hasanate.*

The Koran elaborates : "To every people have we given a law and a way whereby they may reach God. If God had wished it so, He would have made you all one people. He has not done so. Wherefore, let every people, in the way prescribed for it, press forward to good deeds. And let none laugh at any other man; perchance they may be better than themselves" :

*Li kullin ja'lna min-kum shira'an
wa minhaja, wa lau sha-Allahu
la ja'alakum ummatan-wahidah,
we lakin leyabul-lowakum fi ma
ata-kum fusta-begu-l-Khairato.
Ya'ayyoh-allazina amanu layashkar
qaumun min qaumin.
A'sa anakupa khairam minhu.*

In other words, according to Koran, God has given every people or nation, its own religion, specially suited to it. The Koran says :

*Ashraf-ul-imani-un yamanak annaso, wa ashray-ul-Islami-un yaslam
annaso mil-lessaneke wa yadeke.*

(Noblest religion this—that others may feel safe from thee;
the loftiest Islam—that all may feel safe from thy tongue and hands.)

At the people's level, Islam in India has been mostly Sufism. And Sufis are even more explicit on all these matters. For example, Rumi's 'Masnavi' has been described as "the essence of the Quran"—the Koran in Persian—even as the Gita is the essence of Vedas. And Rumi says :

*"Ruh ba aql-ast o ba ilm ast yar
"Ruh ra ba Hindu o Muslim chekar?"*

(The soul is concerned with wisdom and knowledge;
what does it have to do with Hindu, or Muslim ?

In another place Rumi writes :

*Baar-e-digar pir-e maa
Khirqe baa zumnaar daad,
Ganj-e navad-saala ra,
raft o baa kuffar daad*

(A second time my revered Ancient went
And changed his gabardine for sacred thread;
His store of wisdom, gathered ninety years,
He gave away unto the infidels,
And in exchange took up their faithless faith.)

And Shabistari says :

*"Mussalman gar bi-daniste ke Butt chist
"Bi-daniste ke dindar Butparast-ist".*

(If the Muslim but knew the idol's meaning, in image worship would he see True Faith.)

The Sufi thinks of renunciation like the greatest Sanyasi. He calls for :

"Tark-e-dunya, Tark-e-utha, Tark-e-Maula, Tarke-e-tark.

"Renounce the world, renounce the other world, renounce (a personal) god, and renounce renunciation itself"—that is, don't be conscious of the pride of renunciation."

Says Attar, the great Persian Sufi saint : "Let the believer rejoice in

his belief, and the sceptic rejoice in his disbelief; all that Attar wants is a drop of the heart-ache of Divine Love."

"*Kufr Kafir ra, wa din, dindar ra,*
"*Qatra-e-darde-dil, Attar ra.*"

Says the Sufi saint : "Shut your eyes, ears, lips, senses, all from outward things; then surely you will see God."

"*Chashm-band, o gosh band, lab bi-band :*
"*Gar na bini ruy-e-Haq, bar ma be-khand.*"

Here is an echo of the Gita : "He who is happy within, who rejoices within, who is illuminated within, that Yogi attains absolute freedom or Moksha, himself becoming Brahma" :

Yoantah sukho'ntaraaramas tathaabarjyotir eva yah,
Sa yogi brahma nirvanam brahmabha'o dhigacchati.

(Gita : 5 : 24)

Even the Sufis' Ishq Majazi (physical love) transforming itself into Ishq Haqiqi (Divine Love) is to be found in Hindu scripture : "As maid delights in youth, and youth, in maid, so may my mind rejoice in thee, my Lord!"

Yuvatinam yatha yuni, Yunam cha yuva tau yatha,
Manah abhi-ramate tad-vat, Mahah mi ramatam Tyayi

(Stotra)

The Alvars and Nayanars of the South sang of physical-cum-spiritual love. Andal is jealous of the conch-shell 'Panchjanya' for monopolising the lips of Krishna; Gita-Govinda is a lyric of love, sensuous and spiritual; Bhaktas like Vidyapati and Chandidas were madly in love with Krishna, like the Gopis.

Indeed this unity of religions covers not only religious thought and religious institutions but even the religious idiom, and the religious practice. According to Max Muller, many Roman Catholic ceremonies have a Buddhist origin. Like the Hindu God, the Muslim God also has a hundred names (Sahasra-naam).

Islam has four classes of men—just like the four castes of Hindus.

The Quran lists them as (1) ul-ul-ilm (men of learning), (2) ul-ul-Amr (men who command i.e. Kshatriya warriors) (3) Zurra (traders) and (4) muzad-war (Mazdoor). And the Hindu's "Dharma, Artha, Kama" become the Muslim's "Deen, Daulat, Duniya"

Even the pilgrimage to Mecca reminds you of the Hindu pilgrimage. The Haji wraps himself in just one piece of unstitched cloth, takes repeated baths, observes many vows of abstinence, shaves his head and goes round the Qaaba as in 'parikrama'. The 'Qaaba', originally built by Abraham of the Jews, literally means the 'Cube', which is what it is in shape. The 'Muslim' Tawiz is the Hindu 'Yantra'; it can be found even in Mohen-jo-Daro. The 'Ameen' of Christians and Muslims is an echo of 'Aum' or 'Om'. 'Butt' for 'Idol' originally stood only for an idol of 'Buddha'; to this day, the Kashmiri Muslim 'Butts' remind you of their Buddhist past. 'Dhyana' became 'Chan' in China and 'Zen' in Japan. The 'Hormuz' of the Persian Gulf is an abbreviation of the Parsi God, 'Ahur Mazda', which in turn is Sanskrit Asu-rah Maha-dhah, 'Lord of the Great Creation'. The Hindu Brahma is the same as the Parsi 'Vahma'. Even Yehowah or Jehovah of Hebrews is J(i)ao of Phoenicians, Hayy or Yahya of Arabic, O-hau and O-hau-hau of Sama Veda. The Cross is a variation of Swastika. And all religions take the aid of a rosary to chant the name of God while turning the beads.

4. HOW RELIGIOUS DIFFERENCES ARISE

The question therefore arises : When there is so much in common in religious thought and practice, why is there so much religious differentiation and, apparently, so much religious strife ? The reason is that while Religion is man's response to the mystery of life, the conditions of life vary with time and place. And so the idiom of religion also changes. For example India is a fertile land with a history of economic surpluses growing into accumulation of wealth and efflorescence of art. This gave many men the time, the leisure and the inclination for cogitation, speculation, meditation. The forest background, with its infinite variety and profusion of growth, was also reflected in the rich variety of religious thought. On the other hand Arabia, with its scanty economy and desert background, could not but produce a simple and direct faith, in spite of the core of religious thought and experience, which it has in common with Hinduism, etc. It was only with the acquisition of territories and wealth that Arabs acquired more art, science, culture, sophistication and different schools of philosophy and law.

Christianity grew in the context of a disintegrating Roman Empire. This led to a certain moral and political vacuum. It was, therefore,

natural that the Church should perform some of the functions that, till then, had been performed by the State. And so the Pope (i.e. Papa or Father) of the Church came to have some attributes of the Roman Emperor, complete with crown and silk dresses. It will thus be seen that History and Geography have a major role in shaping a religion beyond its core. This makes for religious diversity and differentiation.

Nor is that all. A society not only has religion, it has customs and ceremonies and laws and practices which it has acquired and adopted over the ages. These constitute the life-style of a society, which it cherishes dearly. Some of these customs and ceremonies have a quasi-religious aura. One can, therefore, never be sure where a society's religion ends, and its customs begin: it becomes one long cultural continuum, which gives a society its personality and its ethos. And this, in turn, gives rise to religious strife, when two such highly differentiated societies come face to face.

Man has been defined as a social animal, a thinking animal, a cooking animal, a laughing animal. Man should also be defined as a wandering animal. Over the ages, tribes of men have been moving all over the earth in search of food, gold, trade and even pure adventure. And so different societies stand face to face. The interaction can be a peaceful and mutually beneficial cooperation, if the object is trade. When, however, the aim is to loot—and kill, burn and rape—it can only lead to the liquidation of one of the two sides—or a bitter and prolonged conflict.

There are cases of hungry barbaric tribes sweeping down on settled lands. For example the Goths and Vandals over-ran Rome. Mongols over-ran India, Russia and China.

These repeated mass invasions grew in their size and frequency after the seventh century when the stirrup was invented. Men could now sit securely, ride fast and fight hard, from the height of horse-back—and with the speed of a hurricane. Before the stirrup, this was not possible.

Where the invading tribes are barbaric, they cause much destruction, but since they don't have much of a culture of their own, they quickly come to adopt the culture of the societies they overwhelm. The conquerors are culturally conquered by the locals—and they even become ardent defenders of the society of their adoption. Where, however, the invading tribes are not all that barbaric, or they have a creedal religion with fixed beliefs, the cultural inter-change is more equal but also more difficult. Where each society takes pride in itself and in its culture, confronting societies face cultural conflict. This conflict is basically economic, social

and cultural—and it is religious only to the extent that religion is part of their culture. Indeed the religious factor is often emphasised as cover for conflict of interests, because its appeal can be used to rouse more men, more deeply, than economic, political or social issues can.

For example the Crusades were launched ostensibly to recover from Arab lands, the Cross on which Jesus was believed to have been crucified. But, the wooden cross could not have survived the more than thousand years that intervened between the Crucifixion and the Crusades. The real object of the Crusades was to loot rich West Asian lands, and settle the surplus West European populations in the 'Fertile Crescent' constituted by Syria, Palestine and Lebanon. One of the Crusades consisted almost exclusively of children who were lectured by the Pope to go and find land and food for themselves. It was a simple cry for 'Lebensraum', that is 'living space'—all in the name of Christ.

Before Timur invaded India, he called a conference of his commanders, told them that both India and China were infidel "Kafirs", and asked them which country they should invade. Nobody thereafter mentioned either religion or Kufr; and nobody mentioned China. Speaker after speaker said that India had huge rivers, difficult to ford; it had dense forests full of lions; it had brave soldiers and elephants "who lift up rider and horse and throw them both away." And yet all of them wanted to attack India because, as Prince Sultan Ahmed said: "The whole country of India is full of gold and jewels...plants which produce cloth and aromatic plants; sugar-cane. And the whole aspect of the country is pleasant and delightful." And so one lac Tartars (Mongols) swarmed into India like so many hungry wolves. "Plunder in war", said Timur, "is as lawful as their mothers' milk to Mussalmans." And because all this murder and loot was carried on in the name of religion, it gave the concerned religion a very bad name. As Al-Biruni, witness to Mahmud Ghazni's raids on India, noted at the time, Mahmud "utterly destroyed the prosperity of the country and performed those wonderful exploits by which the Hindus became like atoms of dust scattered in all directions, and like a tale of old in the mouth of the people. Their scattered remains cherish of course the most inveterate aversion towards all Muslims."

5. WHAT DIVIDES THE PEOPLE :

The Indian objection was not to Islam. Sant Tukaram, contemporary of Shivaji, went so far as to say: "Never forget to take the name of Allah first." Hinduism, by definition, looks upon all religious thought and practice as legitimate.

As Ghalib put it :

"Kahan aisee azadiyan hai muysair

"An'al Haq kaho aur mau't no pao'?"

(Where else, can you have the freedom even to say 'I am God'—and yet not face death ?)

But India could not accept 'rapine' in the name of religion. And when the invaders attacked in the name of Islam, they ensured a bad name for Islam in India. The converts were described by Arabs as "Mawalis" that is agents or clients—and Hindus also viewed them in the same light, as quislings.

India had thousands of Muslims living peacefully in Delhi itself before Mohammed Ghori. They included Hussain Shah, brother of Ghori. These Muslims had no problem with local Hindus. According to Chand Bardai's 'Rasso', they actually joined hands with Hindus and many of them, including Hussain Shah, died fighting for Prithviraj. But once the invaders had occupied the land, and they used the sword and the temptation of land and/or office to convert Hindus, Islam lost its legitimacy as a religion in the eyes of Hindus ; it became a case of political aggression.

Fortunately, this stark situation did not last very long. Tribes and dynasties, all "Muslim", fought each other and competed for alliance with Hindu princes. As Hamuyan Kabir has pointed out, there were more wars among Muslims than between Hindus and Muslims.

More. Though Islam started out as monolithic, it did not stay so very long. There is something in the mental make-up of man that rejects a monotonous and deadening uniformity. Hinduism of course always had its sects and sub-sects. And the Muslim Millat also soon divided itself not only into Shias and Sunnis but into as many as 84 sects, with half a dozen systems of law. Christians divided not only among Roman Catholics, Orthodox Greek Church, Coptic Christians and Syrian Christians, but into a variety of Protestant sects, ranging from Presbyterians and Episcopalians to Jehovahs Witnesses and Seventh Day Adventists. Even the small Sikh religious community grew into Namdharis and Nirankaris, Nirmalas and Udasins, Mazhabis and Nihangs, Radhaswamis and Sindhi Sikhs.

The Mughals made war on the Bahmani kingdoms of the Deccan, not only because Delhi assumed paramount power over all India, but also because these kingdoms were 'Shia'. In retaliation, the Bahmani kingdoms allied themselves with fellow-Shia Iran, which now disputed Mughal control of Kandhar, the central Asian gateway to India. It was this Delhi-

Deccani Sunni-Shia conflict that made it possible for Marathas under Shivaji to come up—just as it was the Maratha-Abdali conflict in Punjab which weakened both, and enabled the Sikhs to come up. Nadir Shah looted Delhi ; and Sikhs looted Nadir Shah himself ! (They could not capture the Peacock Throne only because it was too well defended !) It was all these actions, reactions and interactions that produced, from the death of Aurangzeb in 1707, and even more so after the Battle of Plassey in 1757, until the explosion of 1857, an increasingly homogenous Indian society, in which the incoming elements had very much influenced Hindu society, but which had lost their own foreign identity, and got Indianised in the process.

This progressive homogenisation was retarded, and partly reversed, by a number of factors. The Hindu-Muslim united action in 1857 persuaded the British to launch on a policy of 'Divide and Rule'. Beginning with separate Hindu and Muslim units in the Army, it went on to separate electorates and weightages and reservations, and with a helping hand from Pan-Islamists and Khilafatists, it ultimately led to Partition. On the other hand, missionary translation, study and revival of Hindu scriptures restored Hindu pride in the pre-Islamic Hindu heritage.

Today the unities of Indian life worked out over the centuries until 1857, have been replaced by the wave of westernisation. Hindus don't study Persian or Arabic, as they used to do until the turn of this century ; even Muslims don't—such is the transformation in the scene. And Muslims don't observe festivals like Basant, Holi, Raksha Bandhan and Diwali, under the influence of modern fundamentalists, as they used to do until modern times. In this situation the "special features" of the two religious societies stand out—inspite of the unities fostered by regional languages and cultures, and by the English language and Western culture in general.

The regional culture partly unifies all people in a region ; but here, too, the religious differences stand out. And a common Westernisation is neither an adequate nor an acceptable unifier ; it can only be one factor in partly unifying the people, not by harmonising their cultural differences, but by by-passing them. The gut issue, therefore, is : How to ensure religious freedom for all, and cultural unity or harmony for the country, so that men may live in peace and harmony, and the country may go forward ?

India has always believed in, and acted on, the principle of religious freedom. This freedom must be not only recognised but respected. Islam believes in the unity of God and the Prophethood of Mohammed ; and this faith is supported by Namaz, Roza, Zakat and Haj. Muslims should

be heartily welcomed to the practice of their religion. In Chinese tradition, everybody praises another's religion.

Nobody should sneer at, or make any snide remarks about, any aspect of any religion. Nor should Hindus and Muslims refer to each other disparagingly. Some Muslims refer to Hindus as 'Kafir' or 'Banias'. And Muslims are slighted as 'Gadia' in Haryana, as 'Laundiya' in Maharashtra as 'Neray' in Bengal as 'Jhat' among Sindhis, etc. These cheap jibes must stop.

Nobody should make any sarcastic remarks about Mohammed—or his many marriages. Incidentally, Shivaji had as many wives—seven—as Mohammed at any one time. Mohammed is not a religious prophet for Hindus; but Hindus could recognise and respect him as the Napoleon or Lenin of Arabs—the great unifier and liberator of his people. Rama and Krishna are not the religious leaders of Muslims. But they sure are heroes par excellence of all India. Even Indonesians accept Rama as their Hero No. 1. And many Muslims have been drawn to the 'Leela' (playfulness) of Krishna over the ages. Muslim maestros sing the glories of Krishna. Fortunately the Ramayana TV serial has introduced Rama even to non-Hindus—and installed him in the heart of one and all. If Muslims and Christians like it, we can have TV serials on Muslim or Christian themes. For example films on Haj pilgrimage can be shown on Indian TV—for the education and enlightenment of Hindus and Muslims alike.

6. HARMONISING DIFFERENT CUSTOMS

All this would be eminently sensible. The problem arises only with customs and practices that have nothing to do with religion but that have come to be thought as quasi-religious, if not actually religious. Reconciliation and harmonisation are necessary here because a certain degree of cultural unity is necessary for the unity and integrity of a state. Every state has its limits of toleration of diversity. If diversities in a state are so great that they make for division, disputes and violence, then these limits of tolerance are crossed, and that country will go to pieces. These limits, therefore, must never be crossed.

Many Muslims look upon invaders and tyrants, who happened to be Muslim, as welcome carriers of Islam. Many of them no doubt spread Islam by the sword. But this practice was not only un-Islamic, it gave Islam a very bad name. Muslim Indians should dissociate themselves from the memory of men like Mohammad Bin Qasim, Mahmud Ghazni, Mohammed Ghori, Allauddin Khilji, Aurangzeb. And they should not hesitate to return to Hindus the more historic temples, forcibly—and un-

Islamically—converted by these bigoted tyrants into mosques. This will be a symbolic gesture that will seal the unity of Hindus and Muslims and effect National Reconciliation. Hundred years back, the British removed the big ornamental doors of Jama Masjid of Ghazni and brought them to India, saying they were originally the doors of Somnath Mandir. The Hindus could have kept these—at least as trophies. But they did not; they examined the doors, said they could not be the doors of Somnath, and had them returned to Ghazni. After 1857, the British had converted the Jama Masjid of Delhi into a stable. It was the Hindus of Delhi, who waited on the British Commander, and had the mosque restored to Muslims. Facts are sacred. Historic truth and historic justice are important for a just peace among contending groups.

In this respect the Sindhi Muslims have set a fine example. They look upon Mohammed Bin Qasim as villain—and his victim, Raja Dahir Sen, as hero. All Indians, Hindu, Muslim or Christian, should look upon Dahir Sen, Anangpal, Prithviraj as national heroes, who died defending the country against foreign invasion.

But at the same time the average Hindu should shed the idea that there were no Muslims who could be accepted as national heroes. Some of them object even to Akbar. They hold it against him that he took a Hindu wife! They do not know that the proposal did not come from Akbar; they do not know that it was Jodha Bai's father, Raja Bharmal, who made and pressed the proposal; they do not know that Jodha Bai was a practising Hindu in the Mughal Palace all her life; and they further do not know that it was not Mughals who refused their daughters to Rajputs, it was the Rajputs who, for a variety of reasons, excused themselves. When Peshwa Bajji Rao took the Muslim danseuse Mastani for wife, it led to a socio-political earthquake in the Maratha confederacy capital of Pune.

Apart from Akbar, there were saints like Kabir and Chisti, statesmen like Abul Fazl and Safdarjang, savants like Dara and Khusrav, poets like Jayasi and Rahiman, Bulhe Shah and Abdul Latif, Lallan Faqir and Habba Khatun. School texts should glorify these men—and street-names should consecrate their memory.

Nothing fosters separatism more than externals like names. (In West Indies etc., non-Christians had to take a Christian name to secure admission in school!) The question is: what has name got to do with religion? In Indonesia even Muslims bear Sanskrit names like Soekarno and Suharto. In China, Muslims bear Chinese names. In Thailand, whether a family is Hindu, Buddhist, Muslim or Christian, the new-born child can only be given one of the Sanskrit names listed in temples. Re-

cently an Indian family in Bangkok named a new-born as "Varuna". But Thailand refused to recognise it, since it was not listed in the temples. When it was pointed out to them that the new name was also Sanskrit, they decided to include it in the temple list—and then they allowed that name to be given!

Bulgaria, which was long part of the Turkish Empire, has a sizeable Muslim minority. Recently it ruled that all Bulgarian children must be given Bulgarian names—and not Arabic names, in the name of 'Islam'. Albania is an overwhelmingly Muslim state in Europe. It recently decided that all Albanian children must be given old Illyrian names, and not any Arabic/Islamic names.

Shakespeare was being poetic, and not realistic, when he said, "What is in a name? A rose, by any other name, would smell as sweet." There is more in names than we realise. We feel sympathy for our group name-sakes; we feel less of it for bearers of 'foreign' names. Muslim Indians should not hesitate to bear at least such secular names as Anil and Sunil, Ashok and Gul, Sisir and Vasant, Amar and Anand, Sonu and Mithu, Ganga and Jamuna, Sindhu and Hind. Interestingly enough one of the more popular women's names in Mohammed's Arabia was 'Hind'; one of the Prophet's wives was also named 'Hind'!

A Mysorean Muslim friend of mine, Mr. Mehkri, a veteran sociologist, now in Karachi, was named Ghulam Mohammed by his parents. Some time back he discovered that nobody even in Arabia called himself 'Ghulam' of Mohammed or Ali or Hussain. He has now renamed himself 'Gulab Motia Mehkri'. Two of the more popular girls' names now in Sind are 'Sindhu' and 'Marui' (Skt. for 'desert-girl'), after a folk-heroine who, like Sita, did not yield to her abductor. Indian names have become very common among Christian Indians. Let them be adopted by Muslim Indians also. (In Arab countries, Christians take Arab names, and not Roman names.)

Until recent times, many Hindus used to be given Persian-based names like Khan-chand, Khushi-Ram, Khub-chand and Daulat-Ram. This practice could be revived—and beautiful Arabic names like Akbar and Kabir could also be adopted by Hindus. If we can have western 'Christian' names like Jackie, Tony and Dolly, why can't we have some lovely Persio-Arabic names? An increasing commonality of names could be a big psychological bridge between religious communities.

Some Muslim practices in India are not Islamic; they are just anti-Hindu, fostered by rulers, out to spite their Hindu resistors. Cow slaughter is one of them; music before mosque is another. The latter issue has

been finally settled by the Supreme Court. And in view of the Koran's laudatory references to the cow—"cow's flesh is poison; cow's milk, medicine" (Lohumoha dauna, wa libnoha davauna)—Muslims should not oppose any measures for cow protection. No responsible Muslim should plead the case of butchers on grounds of their right to freedom of occupation. For one thing, total ban on cow slaughter will still leave them free to live by slaughtering other animals. For another, if this right were to be carried to its logical conclusion, Zamindari-abolition should be illegal since it deprives Zamindars of the right to live by their lands!

Until recent times all people used to keep facial hair as per their local social and/or religious custom. And that distinguished them. It made for variety but it also made for differentiation. Fortunately or otherwise, cleanshave—or a mini-moustache—is the new fashion for all. And the pant is increasingly replacing dhoti, pajama, lungi and salwar. But the Hindu still looks askance at salwar; and the Muslim tends to ridicule Dhoti. Some Muslims still look upon sari as 'Hindu'.

Now fact is that sari, as we know it today, is only some 200 years old; there is no sari in Ajanta or Ellora cave murals. And salwar itself, if not too baggy, looks just like stitched dhoti. Today the 'Muslim' salwar-kameez is popular with young Hindu ladies in large parts of the country. And sari is popular with Hindu, Muslim and Christian ladies alike all over the Hindustan Peninsula. Interestingly enough, some of the best saris are woven and embroidered by Muslim workmen—even as many temples are constructed by Muslim builders.

Many Hindus look upon 'Khan' as Muslim; actually it is an old Central Asian word for 'Chief', just like 'Sardar'. And even the dome-like 'Kulah' in the Pathan turban is not 'Muslim' or 'foreign'; you will see a devotee in Ajanta frescoes wearing it.

Muslims have come to look upon the Green Flag as Islamic—and Chand-Tara as Islamic symbol. Actually, Green is the colour of old imperial Iran. Mohammed carried flags of different colours in his many wars, including the Bhagwa; but it so happens, that he never carried a Green Flag! There is, therefore, nothing Islamic about the Green Flag. And Muslims—and secularists—should have no objection to accepting the Congress Flag Committee Report of 1934, recommending the adoption of the ancient Bhagwa Dhvaj as the National Flag of India.

Likewise the crescent moon is beautiful for all mankind. It finds its place in Shiva's knotted hair and in the Hindu's 'Om'. There is nothing 'Islamic' about it; the symbol is universal and it should be widely used by all.

Today the Muslim looks upon circumcision as "Islamic"—and must; the Hindu has a holy horror of it. The Hindu has always looked

upon a physical deficiency, deformity or amputation as ugly and inauspicious. It weighed very heavily on forced converts who re-embraced Hinduism.

This practice has an interesting history. It is not Islamic; it is old semitic, being common to both, Arabs and Jews. Whether it started as an aid to easier cleanliness or heightened sexuality—or something else again—is a matter of disputation between sociologists. But this little is known: when Muslim attackers were keen to convert more people quickly to Islam, they dispensed with circumcision, since the Hindu was allergic to it; but when they were keen *not* to share the loot with too many new converts, they insisted on circumcision—to keep the number of co-sharers down.

Interestingly enough, Mughal emperors from Akbar down to Bahadur Shah Zafar, were un-circumcised Muslims. Many elderly Muslims got themselves circumcised only when they moved to Pakistan. On the other hand, many children in the West are now-a-days circumcised.

7. A CONCRETE PLAN OF ACTION

India has always been the land of freedom of thought, expression and life-style. That being the historic context, it should be eminently possible for all people, Hindus, Muslims, Christians, to live together in peace and amity—given good sense, good faith and consciousness of a Common Manifest Destiny. We will all sink or swim together.

1. First of all, the history of India written by the British from the imperial angle, and mechanically regurgated ever since by Indian authors, should be replaced by one written by Indians from the Indian angle. It should be people-oriented and not king-centred. Such a factual and balanced history of the Indian people will do more to harmonise relations than anything else.

2. All schools should provide moral instruction with special reference to the life and teachings of great religious leaders.

3. The life, limb, property and honour of all citizens must be safe and secure. Any social violence must be immediately inquired into, the findings published, the guilty punished and the victims compensated.

4. The lifeless Minorities Commission should be replaced by a Human Rights Commission at national, state and district levels to deal with all complaints of discrimination on grounds of caste, creed or language.

5. Muslims don't have to be more "Islamic" than Mughals. Like those Muslim rulers, they should join in celebrating Dussehra and Diwali.

Basant and Holi. Indeed, just as non-Christians celebrate Christmas in Christian countries, non-Muslims should celebrate Idds in Muslim countries and non-Hindus should celebrate Hindu festivals in Hindu lands.

6. Also Muslims don't have to be more 'Islamic' than Pakistan. If they are not yet ready for a Uniform Civil Law, they should at least accept such amendments in Family Laws as have been enacted in Pakistan, banning, for example, bigamy.

7. All organised mass conversions should be banned.

8. Political parties whose membership is confined to any one community, should be banned. But all minority interests should be helped to protect themselves through a system of proportional representation, as demanded by Muslim members of the Constituent Assembly.

9. No religious leaders or organisations should be allowed to receive foreign funds—except from persons of Indian origin. Just as Indian religious leaders working outside India, do not get Indian money to spread Hindu thought abroad, Muslim and Christian religious leaders or institutions working in India should not get foreign money from Arabia, USA etc.

10. The Indian Constitution should be worked in the true federal spirit so that units and areas in the Hindustan Peninsula outside of the 'Indian Union' consider it worth their while to join the Indian state on honourable and autonomous terms, for we are all One People.

11. Article 30 of the Constitution should be amended to provide that while any "minority"—or even "majority"—can run educational institutions of its choice, the same must be governed by general rules in respect of admission of students, recruitment of staff and standard of education.

12. Above all, Hindus, Muslims and Christians must learn to respect each other's religion. As Gandhiji rightly said: "There is, in Hinduism, room enough for Jesus, as there is for Mohammed, Zoroaster and Moses."

If the people of India move in this direction, there will not only be peace in the land, there will be peace in the minds of men; it will also be a rich contribution to world peace. Such a positive National Reconciliation could move India to the front rank of nations, make a valuable contribution to a New World Order and lead to a trans-valuation of human values. A just and fair resolution of the "minority problem" is the fulcrum on which the lever of the future of India—and of the world—depends. So help us God!

The Philosophy and Technology of Living in Tune with Nature

—Sailendra Nath Ghosh

"MANKIND IS a part of Nature and has to live in harmony with Nature"—this great truth has been known to the people of India from the dawn of civilisation. That is why worship of Nature has been a part of Indian tradition. India's ancient culture emphasised that one can live only by letting others—including all other species of creation—live. In Europe, however, the philosophy of conquering Nature emerged with a bang in the 17th century and spread to the U. S. A. and other continents with the migration of the white races and build-up of their empires.

The results of this aggressive philosophy and its supportive methodology were evident in these Western countries' industrial and military prowess; high-consumption lifestyle and technological feats on land, under water, in the air and in outer space. These so dazzled the world that the Western civilisation became an object of emulation by all continents.

Only some outstanding poets and thinkers like William Blake, William Wordsworth, Percy Shelley, Mary Shelley, Henry Thoreau, John Ruskin, Leo Tolstoy, Edward Carpenter, Rabindranath Tagore and Mahatma Gandhi voiced their conscientious objections to this pattern of dehumanising technological civilisation.

Since the conquest of Nature took giant strides in the 20th century and more particularly during the Second World War, its devastating effects came to the fore and have been accelerating since the 'forties. Now, mankind shudders at the prospect of thinning of the stratospheric ozone layer, melting of the icecap; chilling or warming up of the planet beyond the endurance of living species; nuclear holocaust and chemical holocaust. This has compelled rethinking about living in harmonious relationship with Nature and given rise to worldwide ecology movement. Ecology is now on everybody's lips. But this has not turned the tide : the annual destruction of environment is many times more than its restoration.

Worse still, the ecology movement is being subverted from within. The subversion is caused mostly by the failure to understand that the environment cannot be saved by piecemeal efforts at conservation or by the aesthetics of the upper classes. (The ethos of the upper classes which grieve over the disappearance of groves but not over the deprivation of famished faces becomes an obstacle to the spread of ecology consciousness among the people). A genuine ecology movement needs the concept of a lifestyle attuned to organic relationship with Nature, the vision of an alternative civilisational pattern, and the know-how to marry this

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philosophy to ecologically sound *technologies capable of meeting people's genuine needs in every sphere*. An ecology movement without these attributes is a deception, an exercise for creating illusions.

In India, too, we have been witnessing a mockery of environmentalism. There are people in high places who would, in the morning, sing paeans to biosphere reserves in the name of ecology and in the afternoon, commission nuclear power plants or super-thermal power plants or big dams in the name of scientific and technological progress. The eco-destructive and inequalitarian consequences of the latter do not seem to bother them. This has been happening because there has been no synthesis of ideas at the fundamental level of consciousness. Lure of glamorous 'modernism' pulls them in one direction; fear of environmental collapse pulls towards another. Caught between these two pulls, the Indian elite pursues a basically eco-destructive path, with some counter measures aimed at preventing too much poisoning of the biosphere in too short a time. Both failure and heavier burdens on people are inherent in this approach.

Basic Questions

The basic questions we have to ask are: what kind of life do we want for ourselves? Should we prefer an acquisitive and consumerist lifestyle in the name of higher standard of living? Or should we regard this as biologically sickening, socially wasteful and spiritually degrading? A lifestyle with no limit on material enjoyment is unhygienic gluttony; it also involves a rapid depletion of the earth's finite resources, a high level of pollution which shortens lives, and deprivation of bare needs for increasingly large numbers of fellow-humans. Alberto Moravia's picturesque description of the ethics of consumerism is worth recalling. "*Production and consumption beyond what is necessary are inhuman*. The consumer (ist) is a glut, not so much because he consumes as because he is convinced, like those simple organisms, that his function is to consume. The Western man thinks of nothing but producing and consuming. The end of modern civilisation is consumption, that is, excrement. One consumes all one can and in the greatest variety: the consumer's ideal is consumption and he strives to live up to this ideal. But the final result is excrement. Consumer civilisation is excremental." (Emphasis added).

Nature-defying lifestyle is artificiality throughout. It means consuming nutritionally inferior foods grown synthetically, processed mechanically and preserved with chemical additives, spending the day time in artificial light, turning the night landscape brighter than days, use of energy-guzzling devices from cooking to transportation and gadgeteering in everything even at the risk of atrophy of the limbs. In social conduct, too, it puts a high value on cultivated artificiality and in public affairs,

on sophisticated hypocrisy. It is against the rhythm of life and against man's innate nature. It is this pattern of civilisation which is now, in its declining phase, causing high incidences of violence, mental illness, death wish, divorce, rape, teenage pregnancy, drug addiction, genetic deterioration and AIDS-like maladies.

Deterred by such experiences, even the one-time votaries of 'high living' are now rediscovering the values of a lifestyle of simplicity and voluntary limitation of wants. This kind of limitation is not self-denying asceticism. It is only the rejection of false needs, which commercial interests seek to impose and the vainglory of status seeks to induce. It is based on the principle of requiring the least, in so far as it is, consistent with healthful living.

Voluntary limitation of wants is not primitivism, pastoralism or 'ruralism' as the Westernisers (euphemistically called 'modernists') seek to describe it. It is born of the experience that consumerism makes its addicts increasingly unfree in the hands of the manipulators of business and politics and that it decreases exponentially the chances of 'the greatest good for the greatest number'. It draws strength from even more positive sources—from the inner glow which attends the triumph over greed. Willful limitation of wants to the minimum of absolute needs, thus, enlarges the possibility of true happiness, true freedom and self-determination.

That sparing food habits lead to better health and longevity is a well-known fact of experience, but the questions that are generally asked are as follows.

Can all the food required for a growing population, even on an austere standard, be grown by natural organic farming?

Would we not require chemical fertilisers, pesticides, irrigation water, electricity—hence, chemical plants, big dams and large power plants?

Would we not need skyscrapers to house our growing urban population?

Can we afford to dispense with automobiles and jet planes and still exist as a civilised people in this age?

If we require all these, do we not need large plants for their manufacture and also some mother industries to make the machinery for these

factories? If instead of 'mass producing' in large factories, we seek production by the masses on small scales, would not the cost of production and the society's total load of labour be much higher? Man has been making breathtaking advances in surgical sciences, *a la* heart transplant, kidney transplant, catscan, embryo transplant, etc.: would these have been possible without a philosophy of conquering Nature? The same kind of argument can be advanced in a philosophical language too. 'Although man is a part of Nature, man's volition is free and civilisation began with the assertion of this freedom. Not to recognise this freedom would be the devaluation of man. Man would, therefore, need to further his civilisation by conquering Nature'.

West Modellers' Blindness

Let us answer the philosophical question first. If man could enhance his humanism by assertion of his freedom from Nature, this could be welcome. What happens in practice are its opposites. First, in seeking freedom (i.e., alienation) from Nature, man alienates himself from his neighbours and ultimately from himself. Self-alienation, personal void and the state of war with oneself leads only to self-destruction (like suicide). Secondly, efforts to conquer Nature requires innovation of greater and yet greater force-oriented applications, requiring increasingly complex organisation, thereby weakening the basis of free co-operation and moral sanction for social discipline, which means, the very basis of man living as a moral being gets lost. Thirdly, Nature-conquering technology results in conquering the vast masses of people for servitude to a few initially and destruction of all ultimately.

Man can enlarge his freedom by knowing Nature's way of working and by moving in step. Man's spirit can soar in sacrifice and love by imbibing a reverence for life, which Nature evolved and has been sustaining by her multiple processes of mutualism, commensalism*, amensalism** and the like, in a co-evolutionary rhythm encompassing all forms of life and their environments. Conforming to Nature's laws is the way to utmost elevation of human spirit.

* Commensalism is a one-sided relationship between two species, in which only one benefits and the other is neither benefited nor harmed.

** Amensalism is a relationship whereby one population definitely inhibits the other while remaining unaffected itself. Amensalism involves several types of chemical interaction with other organisms. One is the allelochemic interaction whereby the organism of one species affects the well-being or growth of individuals—or the population biology—of another species by the production of inorganic inhibitors.

Now, to answering the scientio-techno-economic questions, Organic farming can certainly yield, *on a sustainable basis*, a much larger food packet than chemicalised farming ever can. Chemicalised agriculture of the recent decades has yielded larger outputs of only wheat, rice and sugarcane at the expense of coarse grains, pulses, oil-seeds and milk (particularly of the grazing cattle) and fish in the paddy-fields, canals and rivers. Milk has to be regarded as the casualty of chemicalised agriculture because the cattle came to suffer from its nitrate, phosphate and pesticide poisoning effects. The traditional farming of rice and fish simultaneously in the paddy fields had to be given up after pesticides came to be widely used; canal fish came to be decimated by agrochemical washings from the fields; and the riverine fish population declined steeply on account of agrochemicals and industrial effluents.

Chemicalised agriculture detracts from the soil fertility which organic manure builds up. In polycultural farming and mixed husbandry, pest incidence is reduced to the minimum: hence, there is no need for chemical pesticide manufacture. It is minor irrigation and family-size farming that are the most productive: hence, there is no need for big dam-connected large canal irrigation. The massive power plants are wasteful, for two-thirds of their primary fuel escape into the atmosphere as waste heat eluding utilisation. The future power plants, in any case, would have to be 'co-generation' units which, by definition, would be much smaller to minimise the distribution costs of the joint products (hot water and hot air). Energy production in future would have to be based primarily on the principle of on-site integration of different forms of energy. In each cluster of human settlements, there would have to be an autonomous 'network of biomass-based fuels, biogas, wind-generated electricity and direct solar energy'. (Direct solar energy application includes the use of solar cooker, solar water-heater, solar collector for space heating/cooling, solar pumps, electricity from solar ponds or like devices.) Such integration of various forms of energy will reduce the need for power generation through large power plants.

Mass awareness of the dangers of thermal pollution and the risk of cancer spread by corona discharges from high-voltage electric transmission lines, will also restrain the demand for massive power plants. The phenomenon of too many automobiles creating traffic jams and the most obnoxious pollutants will lead to a growth of demand for bicycles on the one hand and mass transport systems (railways, buses, etc.) on the other. All these changes at the user end will tend to check unbridled industrialism as also gigantism. This will naturally affect the nature and extent of mother industries. Increasing social problems arising from impersonal relationship in large industries will also compel a switch towards small-size plants and human-scale technologies. As for skyscrapers to meet urban accommodation requirements, the galloping growth

of urban population is itself the product of unnatural trends—that is, unnatural farming practices and ownership of farmlands driving away rural population and unnatural concentration of industries luring this population. Moreover, any population growth, in excess of the marginal, is itself the result of unnatural factors—such as fears about the mortality of children and the perverse expectation of larger family income from several sons' labour. There have been several tribal communities whose natural foods, apart from keeping their youth in robust health, strengthened the women's natural contraceptive powers. Moreover, the growth of human population to five billions has itself been an unnatural development: it is a violation of the natural law of interspecies balance, under which the most complex animal, namely Man, should have been fewer in number.

The Greatest Stumbling Block

These pointers to the need for, and indicators of, the growing strength of the trend towards naturalness in living will not be enough to convince those who have developed an unshakeable faith in science's ability to sustain mankind's prodigality as well as physical and mental well-being. Nor will these be enough to convince those who have come to believe that 'modern' science and technology will one day reduce disparities and bring everybody to the standard the upper middle class enjoys today. Since the presently dominant pattern of science and technology has become the greatest stumbling block to ecologically sound life pattern, and since it has been providing the basic format of oppression and yet succeeding in spreading the illusion about its potential to liberate the oppressed, it will be necessary to uncover its nature fully. The world view which guides 'modern' science does also profoundly affect intellectual processes, perceptions, the relations between human beings as also between humans and other species of creation, and the life-support system. Without a change in this world view, there can be no change in life's outlook or ethical values. Since 'modern' science and technology have become an overriding religion and a super-ideology affecting every aspect of life, we will need to attempt a thorough examination of its world view, methods, effects of application, and direction.

We would need also to review the prime values of our religious inheritance and certain seminal political and economic concepts to bring all streams of thoughts into a harmonious blend. Examination of political and economic concepts can follow that of science and technology. Let us first have a look at the foremost religious values for the majority of our population.

Albert Schweitzer was critical of the currently dominant Hindu tradition as being 'the inactive ethic of perfecting the self alone'. Con-

trarily, 'Christianity preaches an active, enthusiastic love of one's neighbour', 'Hinduism enjoins only harmlessness, not love', he said. Even though there have been several Indian traditions of overflowing love in the past and many outstanding examples of fearless, self-effacing love from recent Indian cult figures (like Ramakrishna, Vivekananda, Ramana Maharshi), there is no doubt that this Schweitzerian criticism of the live Indian tradition is valid. Reverence for life of fellow-humans cannot be claimed as a characteristic trait of Indian tradition now, while reverence for life of other animal species may be stronger in this country than elsewhere, speaking of the masses as a whole. What is needed is reverence for life as a whole and for the environment that sustains it. With this should grow the philosophy that there is no individual *moksha* (salvation) divorced from the stirrings for collective *moksha*. Only then will it be possible to live in harmony with Nature.

II

GENUINE ENVIRONMENTALISM IS THE KEY TO THE LIBERATION OF THE OPPRESSED

ECOLOGY movement is superficial if it is not informed by the perspective of, and meshed with a programme for, the liberation of the oppressed.

Unfortunately, there are several kinds of environmentalisms.

One is the environmentalism of industrial and commercial interests which seek to continue the pollution-creating, concentrated-energy-based pattern of technology in production system: they want merely some landscape and waterscape amelioration measures to satisfy their aesthetic sense, to create market demands for new mechanical devices to counter air-pollution. That natural processes and ecological principles can be so incorporated in the pattern of production as to minimise pollutant generation does not interest them because it would not serve the commercial interests of big corporations.

Then, there is another kind of environmentalism which is the favourite of the Establishment in countries like India. It wants to cleanse rivers of visible pollutants and to organise 'forestry' by planting saplings of a dozen varieties while allowing the destruction of natural forests of immense bio-diversity in the name of 'development'; that the non-too-visible agro- or industrial chemicals flowing from fields and factories may be even more harmful; the plantations of a dozen varieties is no substitute for natural forests; that the emissions from chemical plants or large thermal power plants may destroy the forests, choke the rivers, decimate aquatic

life and create health hazards for the people around; and that big dams for massive hydel generation invite ecological disasters and make beggars of the oustees (mostly tribals), do not trouble the conscience of the practitioners of this kind of environmentalism. They have no need to search for unglamorous alternatives even if these may serve the social purpose better: they prefer only the devices which lend themselves to centralised manipulation. They talk of environmentalism for form's sake; their main concern is 'modernism', i.e., progress on the Western model, heedless of the signals of its instability and degeneration.

The third kind of environmentalism fights consistently against anti-ecological projects such as big dams, nuclear power plants and the quarrying activities which dry up springs and choke rivers with debris but does not relate these struggles to any concept of alternative civilisational pattern. This school remains taciturn about the lifestyle of simplicity. It refrains from emphasising (i) that high-energy use leads to high entropy¹ and high inequity, and (ii) that development should be based primarily on renewable forms of energy and biological resources.

Then, there is a thorough-going environmentalism which views things holistically. It seeks to link the movement for ecological preservation with mankind's survival and liberation of the oppressed. It seeks an alternative lifestyle, alternative science and technology, alternative politico-economic concepts with its structuring and superior ethics based on universal love and harmony with the cosmos. The production system it visualises is based on natural processes and techniques which serve to continually improve the resource base, rid people of drudgery and back-breaking labour, and do not so depersonalise the production system as to turn human beings into faceless units of the work force. The consumption system it seeks to establish is the least tinged with commercialism, its principle being 'no export to outside locales until the bare needs of all within the local community are met'. Ecology is unsustainable without a communitarian system. Environmentalism is incompatible with a technology which pushes out more and more people from access to resource for production of life's sustenance.

Prime Minister Rajiv Gandhi came close to this position in his address at the U.N. on October 19, 1987. He said: "When village ponds and wells go dry, it is the poor who trek to ever more distant sources for water. When forests are destroyed, it is the poor who go farther and farther afield in search for fuelwood. As lands are degraded and forests recede, it is the poor and their animals who, in the dry season, trudge hundreds of kilometres in search of grazing lands. It is the

¹Entropy is disorder. High entropy is the way to what is known in India as *Pralaya* i.e. destruction.

livelihood of the poor and their hopes that shrivel in the arid anguish of drought and are drowned in the raging fury of floods.

"It is also the poor who suffer most from pollution. When waterborne epidemics strike the urban slums, it is the poor who are afflicted by disease and even death. When factories spew harmful gases in the air it is the workers in the nearby housing colonies who suffer the contagion. When industrial units discharge their effluents into the rivers it is the poor fisherfolk who are deprived of their income".

Although this statement was more advanced than his late mother's averments and explained why the poor have a higher stake in ecology, it still failed to realise that natural processes and ecological principles hold the key to the poor people's liberation.

Indira Gandhi's famous statement was, 'Poverty is the worst polluter'. Although it is a profound truth in itself, it came to be the carrier of a perverse message that poverty should first be fought and the battle for environment can be taken up later. But how can poverty be fought first on the present pattern of development which is dominant in the West? That is indeed the way to perpetuate poverty. Hence, this statement betrayed a lack of awareness that without the light from ecological principles, liberation can never be achieved.

Inseparability of Two Battles

It will be interesting to recall how the present writer woke up to ecology movement's potential for people's 'leap into freedom' and how ecology movement is really a fight in all aspects of life. As an activist in the cause of Marxian socialism, he had in his youth taken the Soviet society's promise of a new humane civilisation very seriously. He used to fondly believe that this type of society would eliminate hunger from the face of the earth, reduce disparities and bring dignity and freedom to all. When this hope was shattered around the mid-fifties, he started searching intensely for an answer to the questions: What has gone wrong? Why could it develop into a bureaucratic and authoritarian society? Why did its grand humanistic vision fall by the wayside?

In the 'sixties, it dawned on this writer that the health of a society depended on the happy blending of private, State and co-operative enterprises and that if any of the elements gets relatively weakened, the society would be diseased. In the early 'seventies, he came to yet another realisation that launching the Soviet society on the 'Nature-conquering' technology as in the West had sealed its fate: it imparted the same kind of centralist and authoritarian values as in the capitalist societies—in fact, even more. The technology which tends to become increasingly forceful

against Nature and is hence capital-intensive and complex, tends to dislodge progressively larger proportions of people from access to it. An agriculture—which is based on chemical fertilisers and pesticides, and electricity from large power plants and irrigation water from big-dam-connected trunk canals—can only condemn the poor to permanent poverty on account of high costs of these inputs and on their susceptibility to being cornered by the local rich. Moreover, this spectrum of technology places decision-making on the vital issues in the hands of agrochemical corporations, State electricity boards, and the dam authorities. In the Soviet society, all these agencies, in turn, transfer decision-making to the controllers of the State apparatus because the State is the owner of all these bodies.

Marxists Against Marx

In industry, the situation is worse. Even in the 19th century, Karl Marx had considered manufacture based on the division of labour 'an assassination of a people', a converter of 'the labourer into a crippled monstrosity'. (This was despite the fact that in Marx's time the large industries were much smaller than those of today and the division of labour then was much less). Few mega-industries will, therefore, have any right to exist, for, these are both unecological and dehumanising. These will also become uneconomic when the 'polluter will have to pay' principle is strictly enforced. (In most cases, an increase in size causes more than a proportionate increase in the pollutants.)

Thus, the issue became clear to this writer. If simple but efficient techniques with long-lasting beneficial effects—which nobody could corner depriving the poor—could be found, that would open the door to universally shared prosperity and freedom for the common people. Study of Nature's ways gave the clues to their solution, which will be discussed in sections four and five.

III

CHARACTERISTIC DIFFERENCES BETWEEN TROPICAL AND TEMPERATE CLIMATIC CONDITIONS

TO LIVE in tune with Nature, the first requirement is to know the characteristics of one's own environment. In India, we live in a tropical environment², which is very different from the temperate climatic environment. The soils in the tropics are poor in organic matter because this organic matter decomposes quickly under the impact of high humidity and temperature which induce high microbial activity. Then, the rainfall

² Even the Indian areas to the north of the tropic of cancer are biotically tropical, except in the higher altitudes. The presence of the Himalays as a barrier to the cold winds has caused this.

pattern. In temperate countries, it is distributed evenly throughout the year. In humid tropical countries, there is torrential rainfall for 3-4 months and then there is a large dry spell under which the soils become parched and turn into hard cakes, which means, they tend to erode very fast during the next heavy rains. While the winds in the temperate countries normally have a higher velocity, those in the tropics are fitful. Except in the coastal areas and foothills and except during the hurricanes in certain parts of the year, their velocity is generally lower. While the pollination in temperate countries is mostly wind-blown, it is mainly through the agency of insects in tropical countries. Which means, if the insects get killed by pesticides, the pollination itself suffers, causing far greater loss.

The tropical ecosystem is far more finely balanced : it found stability through a much longer chain of interconnectedness. The humid tropical ecosystem teems with far more diverse species of plants, birds, fishes and other animals. The tropical rain-forests add another dimension. In one patch of a tropical rain-forest, there may be a much larger number of species than in the whole of the U.S.A.

From this, it follows that if you apply Nature-conquering technology here, it will have a disruptive effect over a much vaster spectrum, in far too many interacting spheres. Nature-conquering technology is no doubt harmful in the temperate climatic zones. But, in a tropical environment, it is far more ruinous. The devastation in the tropics is also much faster.

Temperate countries have been using chemical fertilisers for nearly seven decades : Yet, it is only during the last one or two decades that their ill-effects have been causing great concern there. But in the tropics the devastation came to be felt only after two decades of their use.

In the humid tropics, Nature provided earthworms and termites in far greater abundance as the builders of the topsoil. Here, the floating ferns and algae too are abundant as builders of soil fertility. The use of chemical fertilisers and pesticides for only three decades decimated these beneficial species. The structure of the soil has been greatly damaged. The carbon-nitrogen ratio in tropical soil being very low, only about 30 per cent of the nitrogenous fertiliser can be absorbed, the rest gets released to the atmosphere as nitrous oxides. (In temperate countries, the amount of this release is much lower.) In wet tropics, the chemical fertiliser applied to the soil gets washed down the canals and rivers or leached to the ground water level much quicker. Hence, the poisoning of surface water and ground water is much higher in the tropics. The pesticides applied in the tropics break down into components due to photo-chemical effect and these broken down products, instead of becoming innocuous, find an easy entry into the

biological systems. This is why the accumulation of the pesticide components is much greater in the animal, including human bodies in the tropics, causing cancer and many other fell diseases.

IV

NATURE'S PROCESSES AND ECOLOGICAL PRINCIPLES

THERE IS a misconception that Nature's process consists of mainly struggles between the species for 'survival of the fittest'. This misconception had its origin in Charles Darwin's theory of evolution which laid lopsided emphasis on competition and overlooked the system of co-operation in Nature and the role of co-operation in evolution.

The basic principles which need to be particularly noted for choosing our pattern of living and strategy of socio-economic activities are as follows :

1. Nature is a whole piece, as intact as a cell, in which everything is in close linkage with everything else. The infinitely small particles, the 'energy grains', form into atoms, molecules, compounds, colonies of organisms and finally into the apex of the ladder, Man. Then, the grain of a human society, the individual, gives rise to a global community.

2. Nature does not tolerate the uncontrolled growth of any one species in relation to the other species of creation and to the 'carrying capacity of an ecosystem. Forced increase of any species or of the 'carrying capacity of the eco-subsystem' is followed by an inevitable decrease. Nature always works towards a balance.

3. The biochemical systems exchange matter with their surroundings all the time. In other words, there is continuous communication (i.e., sharing) between living things and their environment, as also among all things living in that environment. An intricate web of interaction connects all life in an area into one vast self-maintaining system. Its each part is related to every other part and each is related to the whole.

4. Recycling, symbiosis and antibiosis are the fundamental processes through which Nature maintains its creation. There is recycling between land surface, water surface and the atmosphere in the global system as well as in the micro-environments. There is recycling between soil, plant and animal kingdoms. The hydrological cycle, the cycles of minerals are different aspects of this recycling process. The energy flows are not exactly cycles, because the used energy gets degraded and becomes entropic. Then, there are symbiotic and antibiotic relations between plants and plants;

organisms and organisms; plants and soil organisms; plants and animals, and between mankind and Nature.

5. There is no enjoyment without a price.

6. There is stability in diversity.

Each of the above principles has a message for the pattern of living and acquiring life's sustenance.

Core of Nature's Messages

The first principle has implications for the orientation that we should give to our development plans. Just as one cancerous cell can destroy a life, a malignant cell in a system of 'social biology'—in other words, an individual afflicted with misery and disease—has the potential to destroy a community. The plan's prior attention should, therefore, be directed to the poorest of the poor. The old idea that 'development is a churning process' and that 'differentiation, i.e., inequality is inevitable in development and is even a sign of growth' has to go. It has to yield place to a search for ways to 'growth with utmost social justice'. A growth without social justice is cancerous growth.

The second principle has a message for limiting the size of the human species, the most complex of all species. It is also a pointer that the cultivated land cannot expand at the cost of forests without inviting peril. Both overpredation and overprotection are against natural laws. If these laws are valid for an ecosystem, these are equally valid for the society of humans.

Unfortunately, in our country, at present, both overpredation (i.e., excessive exploitation by industrial and commercial interests and the elite) and overprotection to a work force which has given up work ethics, are rampant.

The third principle, which points to 'continuous communication between a thing and every other thing in an environment', shows that the resources available within an environment are more in tune with the requirements of every other thing in the locale. (This should mean that the green manure, farmyard manure or compost from the local material is more in tune with the requirements of soils, plants and animals in the area.)

The fourth principle has great significance for the direction of development. This principle should, in fact, be the mainstay of all socioeconomic activities. (We would, therefore, discuss this in depth in chapter five.) Knowledge of these three processes of recycling, symbiosis

and antibiosis reveals to us how the current agricultural and industrial practices of the technological societies of both capitalist and socialist varieties have been, on the one hand, neglecting Nature's bounteous, yet inexpensive technology and, on the other, inviting long-term ruin by breaking the cycles and interfering with the other processes, all in the name of forcing up the yields of certain crops of the elite's choice.

Knowledge of these processes would show how vast a scope there is for a decentralised pattern of development and for people's direct participation in running the government at the local level.

The fifth principle (that there is no enjoyment without a price) is a reminder that we have to pay a price for even renewable energy. Hydro-power generation, beyond a certain level, would ruin upland catchments, impede the flow of rivers, cause siltation and invite ecological disaster. Solar energy, if sought to be harnessed in a concentrated manner, will be highly expensive, besides creating radiation hazards.

The sixth principle suggests that reduction of diversity in the crop pattern, in the forest stand, in dietary pattern, etc. is ruinous. Diversity of genetic pool is the best for survival. It also means that there has to be a mix of several sources of energy—preferably, renewable sources—instead of utmost exploitation of any one source or form.

All these natural principles affirm interaction between the animate Nature and its total milieu. Those who do not appreciate this indulge in glib talk of colonisation of outer space by man. It tends to suggest a tenacity to continue with the rapacious ('nature-conquering') technologies and to find refuge in space after making this planet uninhabitable. These fantasy builders have reckoned without one natural law: the more complex a biological system, the greater its difficulties to adjust to a new environment. And man is, indeed, the most complex animal.

V

DANGERS OF DISRUPTION OF NATURE'S PROCESSES OF RECYCLING, SYMBIOSIS AND ANTIBIOSIS

THE EARTH'S RESOURCES, with the exception of the incoming solar radiation, are finite. The waters of the oceans, rivers, lakes and aquifers, the air enveloping the planet, the gases in the atmosphere, and the elements in the crust or those erupted from the deeper interior are all limited. Hence, recycling is Nature's way to maintain life. But for these processes, Nature would not have been able to support life for more than a short period and the earth's settlers would have been engulfed in wastes.

The cycles involving biochemical and geological processes are so finely balanced and set on performing various essential functions at different stages that man's actions towards *breaking* or *accelerating* any of the cycles spells disasters.

Since man's activities in recent times have been disturbing the hydrologic cycle and the carbon-oxygen-hydrogen cycles and also the nitrogen, phosphorus, sulphur, mercury and a few heavy metal cycles most, a brief pointer to their vast complexities in interrelatedness and to the marvels of their functions at each distinct stage needs to be given here.

Hydrologic Cycle

The sun's energy falling on the sea warms it and evaporates some of the water at the surface. The warm vapour rises and forms clouds. Most of these condense above the sea and fall as rain in the sea itself but some clouds are carried away by the wind to precipitate on land areas. Thus, while 16 percent of the global evaporation takes place on the land surface, it receives about 23 percent of the global precipitation. This process of the vapour from the saline oceans raining sweet water on land surface represents the working of Nature's vast desalination programme. The land surface gives in turn its run-off water through the rivers. In the process the run-off performs the useful function of carrying away the toxins from the land surface³.

In truth, every form of water in this cycle performs a key role in the earth's energy budget. Ice, snow, and clouds reflect back into space much of the incoming radiation. Again, the clouds limit the earth's "back radiation" of heat into space by re-reflecting it to the land surface. Atmospheric water vapour strongly absorbs energy in the infra-red region of the spectrum and serves as the chief insulating component of the atmosphere preventing the extremes of day-time temperature and night-time cool.

It is, therefore, not in our interest to reduce to a trickle the surface run-off of the sea, or to cause the snowline to recede, or to weaken the shield against lethal incoming radiation or the cloud chambers limiting the heat and the cool. Nor is it sensible to talk of desalination of sea-water while working in a manner which makes every river basin saline.

Carbon-Oxygen-Hydrogen Cycle

These three cycles are so interrelated that it is impossible to discuss one without the other. The plants use sunlight to absorb carbon dioxide from the atmosphere and to combine the carbon and oxygen atoms with the hydrogen from water taken up through the roots—to form carbohydrate molecules, after a series of reactions. This is called photosynthesis

³ "Modern man", in his emphasis on irrigation, tends to forget the importance of draining away the toxins from the land surface to the ocean.

process. The carbohydrates thus fixed in plant bodies are the source of supplying carbon content to all forms of life. (No cell is without carbon content.)

The photosynthesis process produces free oxygen and releases it to the atmosphere. This oxygen is the "breath of life" of the animal kingdom. Plants themselves use it for respiration at night when the photosynthesis process is not working. Thus, the carbon-oxygen exchange saves the lives of men, other animals and plants in terrestrial regions. On the seas too, an equivalent process is in operation, wherein the carbon dioxide dissolved in sea-water is available to phytoplanktons for photosynthesis. The carbohydrates thus formed become the food for fish; and the oxygen released by photosynthesis is dissolved in water to become useful for aquatic life's respiration.

The removal of carbon dioxide from the atmosphere and from the sea-water by photosynthetics for its conversion to the chemical energy of the carbon bond; the flow of carbon from molecule to molecule, cell to cell, organism to organism, and generation to generation; its return to the atmosphere and the sea-water through plant and animal respiration and through the respiration of the decomposers of dead bodies of plants and animals—all these are parts of this cycle. Formation of coral reefs and limestones and their subsequent dissolution, the formation of coal and petroleum and their combustion are also aspects of the cycle. The dominance of the latter aspect (i.e., fossil fuel use) is now overwhelming and disrupting the cycle.

Some seventy percent of the planet's free oxygen produced each year comes from the planktonic diatoms in the oceans. (Yet, we are decimating the planktons by oil spills and other polluting substances.) Forests and phytoplanktons are the two sources of oxygen production. Both these are being decimated. We, therefore, seem to be set on blocking the oxygen cycle.

At the same time we are combusting fossil fuels and producing carbon dioxide much more rapidly than the oceans can absorb. Carbon monoxide and fluorocarbon in the atmosphere have been creating holes in the ozone layer and raising the spectre of all life being scorched by lethal doses of ultraviolet rays; the accumulation of carbon dioxide in the atmosphere has been warming up the earth and creating the danger of drowning all life fathoms deep.

Nitrogen Cycle

The inert nitrogen gas, which constitutes about 78 percent of the atmosphere by volume, is made to combine (i.e., "fixed") with other elements by lightning and photochemical reaction; by free living and symbio-

tic micro-organisms⁴. (Man-made industrial processes, too, fix it producing some imbalance in other spheres.) Its return to the atmosphere is also through the action of bacteria, called denitrifying bacteria.

The global cycling of nitrogen is biologically and chemically the most complex of the biogeochemical cycles. Nitrogen's largest reservoir (about 80 percent) is in the atmosphere; a substantial part of the remaining 20 percent is in the soil organic matter. Another significant fraction is contained in living things—almost entirely as organic compounds.

Nitrogen can enter the soil through the process of "fixation" as mentioned above. It can also enter the soil from the decay of pre-existing plant matter and animal wastes. Much of the nitrogen from both these sources eventually becomes incorporated in the soil organic matter. The organic matter slowly releases this nitrogen through the action of soil micro-organisms, which finally convert it into nitrate. (Higher plants require most of their requirements of nitrogen in the form of nitrate although part of their requirements can be met by ammoniacal form.) The plants use this inorganic nitrogen to build their own amino acids and protein and other organic compounds utilisable by animals and micro-organisms. Animals and micro-organisms get the nitrogen for their protein directly or indirectly from the proteins of plants. When plants and animals die, decomposer organisms—primarily micro-organisms of another sort—break down the proteins, mainly to ammonia. Hence, this little cycle—ammonia to nitrate; nitrate to protein; protein to ammonia—operates within the larger nitrogen cycle.

Interestingly, there is yet another type of micro-organisms, called denitrifying bacteria which convert nitrate to molecular nitrogen to maintain the composition of the atmosphere. The denitrifying bacteria get the energy for their activities by oxidising the organic matter in the soil. Here, "there is a cycling of carbon that goes along with this nitrogen cycle, and there is also a cycle of oxygen involved".

It will thus be seen that in Nature's process, there are three classes of bacteria involved—the nitrogen fixing bacteria; the nitrifying bacteria; and the denitrifying bacteria. And the precision, in terms of carrying out their function at a pace not more rapid than the possible uptake of their product, is remarkable. "By far, the slowest step in this cycle is the release of nitrate from humus. As a result, the natural concentration of nitrate in the soil water is very low and the roots need to work to pull it...In Nature, little nitrate reaches the soil because of its thrifty use in the soil cycle. As a result, the nitrate content of natural surface water is very low,

of the order of one part per million, and ...the water clear and largely free of noxious organic debris".⁵ Man has tried to increase the nitrate concentration in the soil by applying nitrogenous fertilisers, with the result that his ground water as well as surface water are getting increasingly poisoned. Nitrate build-up in the soil tends to decrease the reduction of sulphate into sulphide, making the soil acidic. Nitrous oxide, released by high temperature combustion processes and by applied nitrogen fertiliser, are weakening the ozone layer and raising threats to life's survival.

Sulphur And Phosphorous Cycles

The above descriptions are merely illustrative of some of the complexities of cycles. It is not possible to discuss here these cycles in greater depths, nor is it necessary to discuss the other cycles beyond making one observation each for sulphur and phosphorus, whose cycles are being disturbed equally seriously by man's activities. The importance of these elements is as follows. No protein, including such prime protein as haemoglobin in the blood, can be formed without sulphur. Without phosphorus, again, no protein can be formed. It is part of what is called the "universal fuel" of living matter, ADP and ATP. Since the beds of marshes, lakes and estuaries, the main homes of anaerobic sulphur-fixing bacteria are being drained out, sulphur fixation—in reality life itself—will now depend on man's defence of these mud beds. The world (and certainly India) is running out of its phosphorus resource. Yet, we are lavishly spending whatever little phosphorus is with us. Between 80 and 90 percent of the phosphate mined is used as fertiliser, much of which ends up in water courses as run-off from agricultural lands, causing algal booms in the streams. (For our present discussion, we are leaving out metallic resources which are, in any case, non-renewable and whose cycles, if any, are in geological time-scale. Heavy metals such as mercury, lead, cadmium, chromium, arsenic, nickel are now being used in considerable quantities in industrial processes. All are toxic and persistent.)

In conclusion, Nature's recycling process takes us to plants, to herbivores, to carnivores, to decomposers and back to air, soil and water. It tells us that no one can exist alone; no one species can exist alone; the foodchain or cycle does not usually operate in isolation. Several cycles and foodchains are so interrelated and interactive as to be inseparable. The more complex and interrelated the chain, the more the feed-back loops; the more the feed-back loops, the greater the stability. Diversity ensures continuity of the whole and is an insurance against the damaging effects of environmental disturbances.

⁵ This quotation is from Barry Commoner's Book, "The Closing Circle".

⁴ Symbiotic micro-organisms are those which are associated with plants.

VI

"MODERN" SCIENCE IS BASICALLY MECHANISTIC TECHNICALISM

THE GREATEST obstacle to the philosophy and technology of living in harmony with Nature is the so-called "modern" science and technology, which are, in fact, fragmented science and machinist technology. Yet, these have acquired the halo of an overriding religion and a super-ideology. We need, therefore, go deep into the philosophy, and methods of modern science and technology which have made them destructive of ecosystems. We need also to take a look at the fruits of application of this pattern of science and technology in the different spheres of our life.

"Modern" science has been following Francis Bacon's philosophy of science, in parts. He defined knowledge as power and wanted to lay the foundation of power through science. What has been forgotten is Bacon's condemnation of looking at isolated facts without considering the unity of Nature. Along with it has been forgotten Bacon's dictum that 'Nature cannot be commanded except by being obeyed'. The idea of *conquering* Nature has been dominant in 'modern' science.

Bacon's rider fell by the wayside under the impact of his exciting call to use science "to extend the power and domain of the human race over the universe". His contemporary, Rene Descartes, a French philosopher, took this power concept to a still higher pitch by his call to humans to be the "masters and possessors of Nature". This placed science on power track. Hence, this science is more prone to "manage" than to understand. It has come to view natural systems for its own purpose of control. Thus, it gets a distorted view of reality.

Now, to the question of methods. The four methods, which Descartes laid down 'as sufficient for arriving at knowledge of things', were as follows: (1) To accept nothing as true which was not clearly recognisable as such, and to avoid prejudice in judgement; (2) to divide up each of the difficulties into as many parts as possible; (3) to carry on the reflections, commencing with objects that were the most simple and easy to understand, in order to rise little by little degrees, to knowledge of the most complex; and (4) in all cases to make the enumeration so complete and reviews so general as to be certain of not having omitted anything.

None of the methods would appear exceptionable to commonsense logic. The study of facts without any bias was necessary in the context of (i) the then prevailing tyranny of referring to the scriptures on every conceivable matter, even against the evidence of observed facts and (ii) the

dominance of scholasticism and the Greek philosopher's tradition of 'pure' speculation which was producing barren controversies. Bacon, too, had revolted against this tradition. Cartesian methods were undoubtedly liberating force in those days.

But as often happens in history, the vehicle of progress in the 17th century became a fetter on the progress of science later. Separating facts from bias came to be understood as divorcing facts from values (i.e., valuational consideration). This stripping of values later became the excuse for the destruction of reverence for life. Value-free-ness of method became the apologia for acquiescence in destruction-oriented pursuits, for everything could be blamed on the methods to cover up the scientist's own sins. Habits of study in parts gave rise to the idea that the sum total of studies in parts, with some allowance for synergism, could yield knowledge of the whole—an idea which is utterly false to life processes and is hence a misguidance to sciences concerning not only plants and animals but all natural resource systems—soil, water, forests—which vibrate with life and interact with living organisms. The original emphasis on mathematics, which was designed to promote exactness to the maximum possible extent, led to the dictum that 'there is no reliable knowledge without quantification'.

The obsession for fitting knowledge into mathematical equations now consumes so much of the science researcher's energy and attention that little time and effort is left for direct observation of Nature. All research has been reduced to tool-dependent research. The importance of keen observation of the surroundings has been devalued. The familiar world of life's everyday experience has yielded to mathematical abstractions.

Avoiding Study of Interacting Processes

What is even more objectionable is that concern for quantitative estimation has prompted (i) the taking up of only those aspects which are amenable to quantification and (ii) the avoidance of those objects/levels which are subject to many interacting forces merely because the complexity of these interactions makes factorwise quantification well-nigh impossible. This avoidance receives support from the guideline that study should commence only at the minutest level.

This has virtually meant postponing study of life at the cellular or organismic level 'until the molecular code has been completely cracked'. Plainly, this is running away from the study of life processes which keep acquiring newer and newer properties at every higher stage in the level of organisation—properties which are not merely additive but introducers of subtle qualities.

A science which is based exclusively on the philosophy of studying all phenomena of Nature in parts (in the manner a machine is studied) and *hardly ever interrelates them holistically* is bound to give wrong leads to all activities concerning soil, water, forests, crop plants and human and other animals' body functioning; and it is on these that people's welfare mainly depends.

The plight of reductionism was best expressed by the venerated scientist, Albert Szent-Gyorgyi: "Those who like to express themselves in the language of mathematics do well to keep to lower levels...but we must not lose our bearings lest we fall victim to the simple idea that any level of organisation can be understood by pulling it to pieces, by a study of its components, that is, the study of the next lower level. This may make us dive to lower and lower levels in the hope of finding the secrets of life there. It made my own life a wild goose chase". "For twenty years I...worked on the molecular level. These studies netted me a Nobel prize but left me without a better understanding. The more I knew, the less I understood; and I feared that I would end my life knowing everything and understanding nothing". His message was: "Even if we limit our work to a single level, we have to keep the whole in mind". This is what the practitioners of reductionist modern science just do not do.

Machinism is Anti-poor

Modern science started as a reaction to the Aristotelean philosophy according to which the whole dictated the parts. Aristotelean philosophy had led to neglect of the study of the constituents. Modern science sought to correct this neglect. But its overemphasis on the prior study of components to the minutest detail and particularly its concept that the universe and all material objects therein could be studied by treating them as machines and dissembling their parts, has been responsible for neglect of study of the *integrative processes in Nature*. As a result, *studies of biological processes and ecosystems have been perverted. Yet, it is on these that people's lives mostly depend.* Modern science's quantitative yardsticks—mass, velocity, pressure, temperature and the fields—are 'sufficient' for the knowledge of the physical world, namely, the celestial bodies in motion, the machines on earth, and the inanimate matter around it. This method suits the study of non-life processes and *at its one* remove, life-destruction-oriented machinist processes, both of which fit admirably with the concept of power. That is why modern science has been most productive in military devices and its civilian fall-outs including high-speed transport and communication systems. *Since machinism has got embedded in the very method of modern science, it is promotive of a high-cost pattern of development which does not benefit common people. Its machinist orientation keeps it blind to inexpensive solutions.* It always favours big projects and complex technologies. The former breaks the

people's back and the latter is inaccessible to common people. It is, therefore, elite-oriented initially and destructive of all life ultimately.

VII

BITTER FRUITS OF SCIENTISM—FROM INDIAN EXPERIENCE

A FEW FACTS concerning the very basic aspects of life in India would reveal the direction in which "modern" science and technology and its associate—namely, commercial culture—are taking this country.

Drinking Water : In the high hill areas of North U.P., which were the homes of numerous springs and sources of streams, the Government has now to send tankers up the hills to supply water in the dry season.

The water of most rivers is muddy. That they once had clear water has now faded from memory. Moreover, these are often laden with toxic chemical substances. According to a report of the National Environment Engineering Institute, about seven years back, 70 per cent of India's water resource was polluted. The situation must be worse now, except in some parts of the Ganga, where concentrated attention is being paid, at great financial cost, to *partially* cleanse the water. However, the rivers everywhere continue to be filled with pesticide and other chemical washings from the fields.

On the frank confession of the Union Minister for Rural Development, Shri Ramanand Yadav, the "drinking water" (from tube-wells) often contains nitrates and sulphides. Besides, every town dweller knows that the pumped water supply is often heavily chlorinated. This is an indication that high levels of pollutants in the water compelled the application of a heavy dosage of chlorine. The taste of pure water is forgotten almost everywhere.

This situation is not despite science but *because* of "scientism" and industrialism induced by it in both fields and factories. The Western countries seek to avoid its ill effects by avoiding plain water in favour of processed water (beer etc).

Land : Out of our 266 million hectares, which had any production potential, 175 million hectares, i.e., 66 per cent were degraded. This was revealed by the Sixth Plan document: the situation must be worse now. The annual loss of topsoil by water action alone, which was estimated at 6,000 million tons in 1972, has now risen to 12,000 million tons. The

area susceptible to flash floods, which stood at 25 million hectares in the early 'fifties, has now risen to 40 million hectares. Devastation by floods has been increasing every year. The extent of water scarcity for most part of the year has been increasing, even in years of high rainfall. The organic matter status of the soils has been deteriorating in all parts of the country. Deteriorating soil structure indicates the advance of desertification process. At least seven million hectares of good agricultural land has become saline due to waterlogging. Throughout the country, the ground water level has become adverse: while in most parts it has receded to far too low levels, it has, in areas under major irrigation, come up dangerously near the crop root zone. The incidence of pests has been increasing; so also the use of pesticides.

Air : Problems of polluted air are increasing not only in major cities like Calcutta, Bombay, Madras, Delhi and industrial areas like Kanpur, Dhanbad, Asansol and Ahmedabad but also in rural areas.

Forests : Denudation of forests has been in progress from the Himalayas to the southernmost tip of the Western Ghats; from the Naga Hills to the Aravallis. We are now left with only 30 million hectares of good natural forests. Considering that the denudation of mature forests is taking place at the rate of 1.5 million hectares per year, it will take about 20 years to liquidate them all. The plantings that are now taking place in the name of increasing the vegetal cover are poor substitutes for forests. In the absence of a cultural climate for their protection and enhancement, even these plantings are in danger of disappearing.

All these facts would show that we are being progressively impoverished in our basic resources. All these are the outcome of a cultural climate and concept of living induced by scientism and Nature-conquering technicism. The Western countries, too, are being impoverished in a like manner. Only their degradation is slower because the temperate ecosystems are not as vulnerable to man-made disturbances.

VIII

BLOCKAGE OF UNDERSTANDING CAUSED BY REDUCTIONIST SCIENCE

IN THE SPHERE of agriculture, 'modern', i.e., reductionist science prescribes chemical fertilisers, chemical pesticides, irrigation and electricity as the basic inputs. This reflects a blockage of understanding

(i) That soil is the central factor in agricultural production and

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soil organic matter is its key. (That this is not really understood is revealed by the fact that India does not as yet have an Institute to study the various aspects of soil. Soil organic matter, too, is placed in the 'also ran' category.)

(ii) That soil, organisms, and plants constitute one whole.

(iii) That the correct principle should be to feed the soil and its microbial population rather than present the plants with large soluble nutrients.

(iv) That the tropical soils have a distinctive character. Their carbon-nitrogen content being very low, their capacity to absorb nitrogenous fertilisers is also low. That the application of these fertilisers would scorch the soil, kill the earth-worms, mycorrhiza, de-activate the nitrogen fixing bacteria, reduce the soil's water holding capacity, pollute the ground water, and also pollute the atmosphere by releasing large quantities of nitrous oxides.

(v) That, in humid tropics, where there is torrential rainfall for certain periods of the year, the chemical inputs flow quicker from the fields to the water courses, polluting the surface water, decimating aquatic life and affecting human and cattle health.

(vi) That the application of chemical fertiliser requires the application of chemical pesticides and that their use pollutes even more the ground water and the surface water—and also renders impossible the culture of paddy and fish in a symbiotic relationship in rice fields.

(vii) That the widespread use of pesticides kills bees and other insect pollinators, restricting the scope of growing fruits or vegetables.

(viii) That these lead to nitrate poisoning and various types of pesticide poisoning of farm cattle, reduce their milk yield, sap the vitality of draught cattle—and affect human health.

(ix) That the use of nitrogenous fertiliser, by inhibiting nitrogen-fixing bacteria, makes it difficult to grow pulses on the same soil. The bacteria, once killed or deactivated, cannot be revived and activated as and when we demand it.

In sum, there is blindness to the reality that this way of securing quantitative increase of wheat and rice production at the expense of their nutritional and keeping qualities serves to reduce the country's total food basket potential. The production of pulses gets restricted; the chemical washings kill the fish population in canals and rivers; and the residues of

agrochemicals in the soil and grass thereon poison the cattle and reduce the milk yield in family homes. This is the reason why the dependence on sea fishing and on stall-fed dairy farming has been increasing.

This increase in mere bulk of a few select crops—even at the cost of other foods in their natural niches accessible to the common people—seems quite acceptable to the practitioners of 'modern' science for their yardstick has been only quantity. No comparative study has been made about the respective nutritional qualities of the pre-existing native high-yielding varieties (which can be organically grown) and of the genetically engineered high-yielding varieties which have a demonic appetite for fertilisers. This avoidance was despite the people's persistent complaint about the quality of the latter.

Inviting Mass Starvation

There was yet another—perhaps greater—blindness of the practitioners of reductionist science to the dangers of drastically reducing the genetic diversity of the crops, although the old-school biologists had been pointing these out from the very beginning. Where there were previously scores of thousands of varieties of rice, there are perhaps a few hundreds *in situ* now in India. In areas where high yielding varieties have been propagated, the varieties have presumably been reduced to a few dozens. The situation in wheat is similar. This is alarming near-uniformity which has created great vulnerability to pests and diseases. When the engineered varieties become pest-prone, as they do every five to six years, introduction of new genetic material will be extremely difficult after this denudation of *in situ* source material. Mass starvation will then be on the cards. (Preservation of germplasms in gene banks is no substitute for preservation of gene *in situ*.)

Thus, with the destruction of the soil's innate fertility and dissipation of the genetic base, the future is dark, grim and gloomy. Responsibility for this rests on the practitioners of reductionist science.

It was the application of fragmented knowledge that was responsible for turning many of the previously innocuous insects into pests, by reducing the diversity of crops and their cultivars. Again, in trying to counter these pests with chemical pesticides, it created more resistant and more virulent pests on the one hand and invited deadly diseases for man and his cattle on the other.

Reductionist science is now mooted fanciful ideas about countering the pests by introduction of viruses, bacteria, fungi, protozoa and nematodes or by radio-isotope, without any basis for reassurance that these will not be worse than the maladies they seek to cure. The real solution was mixed husbandry, mixed cropping, crop rotation, etc. Farming with diver-

sity would have, in any case, given more production in the total. Contrary to the feeling that reduction of diversity is necessary to increase the production of preferred crops, it is bio-diversity that maximises bio-productivity and yields a larger food package. Simultaneous culturing of diverse crops on the same field is not, however, conducive to mechanical sowing or harvesting.

The biological principles, which the pesticide-application-oriented reductionist science violates, are as follows:

(i) Predation of plants by insects and other organisms is Nature's own device to keep the plant species vital by removing the weak individuals and by exciting the species to high biological activity. 'An evolutionary race' between plants and insects takes both plants and insects towards perfection. Plants need to deploy a fraction of their metabolic budgets on various kinds of defence, and the insects to sharpen their devices to locate the preys and tear their defences. Prey-predator interaction is the means to competitive co-evolution. (Hence, seeking to stop this beneficial evolutionary process is an invitation to losses. Seeking to stop it by chemical means is courting disaster.)

(ii) Predation is Nature's weapon to make room for other species whose ecological requirements are similar and thus to maximise biological productivity of a given micro-environment. The biomass production by a mix of species always exceeds that by a single species. It also maximises the utilisation of energy available to a biome.

(iii) The great majority of insect species operates for most parts in the interest of human and plant welfare. Broad-spectrum chemical pesticides, by killing non-target species as well, brings great harm to mankind. This causes greater harm in tropical countries where pollination in a vast majority of cases is by insects (unlike in temperate countries, where it is more by the agency of the wind). Since the termites and earthworms play a far greater role as soil churners and topsoil builders in tropical countries than in temperate conditions, their decimation by pesticides causes far greater havoc in the tropics.

(iv) Pesticides, ironically, always leave the target species (the pests) in a stronger position than their predators. Even if the pesticide reduces the same percentage in the population of the target species and their predators immediately, the proportion of the former will soon be far greater. The species which are lower in the pyramid have many more generations per year than their predators. This is even more so in the tropics. Thus, quicker reproduction cycle *plus* high reproduction rate helps them grow numerically stronger while the predator species may become extinct for

lack of minimum density of population. Moreover, the surviving species, by their power of counter-adaptation to the emerging environment, become more resistant. Hence, pesticide use gives rise to more virulent pests in larger proportions, as has been seen in every case.

Practitioners of reductionist science claim that pesticides disintegrate faster in tropical conditions due to photochemical effect. But they do not conduct research to see what substances these degrade into and where the broken-down products find their way. The bio-accumulation of the degraded substances in all cold-blooded animals and in plants is much more in the tropics than in the temperate zone. Thus, the broken-down products of pesticides harm the tropical man more *through the foodchain*.

There are pesticides which are not highly toxic themselves but whose broken-down products are. In spite of the warning given by Rachel Carson a quarter of a century back, the practitioners of reductionist science have not cared to see if the open fields, where various weedicides and insecticides interact, are proving to be factories for production of unforeseen toxins.

Thus, the havoc caused by pesticides to human, cattle and plant lives is going to be far greater than has been acknowledged so far.

Crossbreeding : A Blind Pursuit

Reductionist science has dangerously limited the genetic diversity of cattle by injecting semen from a proportionately much smaller number of bulls. An instability is thus built in, with the prospect that epidemics can wipe out large herds of cattle. Crossbreeding with exotic cattle, without concern for the adaptability (of the offspring thus bred) to our environment increases this instability. Reports have recently been appearing about the widespread diseases—and death—of this category of cattle.

This havoc has in fact been invited because several highly productive breeds of native milch and draft cattle (at least seven in each category) have been ignored in pursuance of a policy of producing single-purpose dairy cows as in Western countries. The exotically crossbred males are unwanted and useless for Indian agriculture; if not sent to the slaughterhouse, these have to be kept in air-conditioned sheds. This has created a grave shortage of bullocks for agriculture.

An example of how reductionist science can lead to two diametrically opposite directions may be given here. Veterinary scientists have been promoting crossbreeds which yield more milk but also eat more. At the same time, forest scientists are increasingly tending to grow types of trees

(e.g., eucalyptus) which cattle cannot browse. Fragmented science is thus increasing the demand at one end and reducing the supply at another. Such stresses are being created in every field of land and water related developmental activities.

Fragmented science lopsidedly plans for irrigation without any pointer that water use in excess of the very frugal leads to salination and infertility of land. It gives much less importance to drainage than to irrigation, despite the statistical information that more than 60 percent of the world's irrigated areas have become infertile. The showpieces of irrigation in the 'thirties and 'forties—namely, the districts of Lyallpur, Sargoda and Montgomery, all of which are now in Pakistan—have now become infertile. Yet, our scientists and technologists are going ahead programming for more and more of massive dams and trunk canals without any heed for the time-tested techniques of diversion dams, anicuts, series of small reservoirs and percolation tanks which can serve better the needs of beneficial types of irrigation.

Plentiful use of water in arid zones would lead to quick evaporation and salt deposition. Yet, without caring to grow crops suited to this environment and without massive efforts at afforestation, our scientists have counselled a trunk canal in Rajasthan. There is every possibility that this will permanently salinise the soil of the command area.

Ignoring the Perils of Big Dam

Experience has shown that the major dams, after causing bumper crops initially, have been contributing to waterlogging, salinity and long-term infertility. By encouraging the trend towards high-water-demanding crops for commerce, these have been causing distortions in the cropping pattern at the cost of the consumption needs of the local population, thereby breeding social tensions. These have been reducing the fertilising silt content in the water downstream and increasing its salt and pollution load. These have been affecting the level and species composition of the fish population, introducing new waterborne diseases and promoting flash floods. Some major dams have also triggered earthquakes. These destroy the livelihood and culture of the oustees, particularly the tribals, despite the proclaimed rehabilitation schemes. Moreover, these have been invariably breeding conflicts between the populations of the upstream and the downstream regions. These are likely to go down in history as sources of sorrow.

Practitioners of modern science, even now, prefer big dams and trunk canals as if there is no workable alternative for irrigation and power generation. Of course, basic changes in the outlook for power use are necessary if the temptation for massive hydel generation is to be resisted.

The basic truths about forests are (i) that forests are primarily pro-

ducers of water and only secondarily, of woods; (ii) that forests are the foster mother in perpetuity for agriculture, and this mother-child relation can never be severed except at the latter's peril; and (iii) that the forests are the common regulator of the state of the three basic resources—namely, soil, water and air. Yet, these forests have been suffering a net denudation of more than one million hectares per year.

Our politicians and scientists put the blame for this only on the mafia of illegal fellers, the tribals and the villagers. If the whole truth has to be told, then, it is (i) the government's policy of building industrial townships in forest areas and massive dams, (ii) the high rate of urban expansion (which requires the supply not of dried leaves but of cut twigs) and (iii) the pattern of elitist living which creates a high market demand for timber, that are basically responsible for this. The forest scientist's concept of clear felling in favour of quick-growing high-revenue-yielding plantations has also been denuding forests and creating favourable conditions for the introduction and spread of exotic weeds and diseases. These are matters as much of science policy as of political policy.

Energy is, and has to be, a major concern of the scientific community. But little thought is given to defining the uses to which electrical power, a high grade energy, should be restricted. The way energy demands are projected makes one feel that there is no risk of entropy and we can go on merrily producing and consuming more and more of concentrated energy—this, despite Einstein's warning that even if all physical laws are invalidated, the entropy law would still remain valid. This is not to dispute the need for more energy but to stress (i) that the low-entropy forms of energy should get precedence in our energy consumption pattern; and (ii) that the estimation of energy requirements should begin from the end of use-needs. Consideration of the form of energy than can take care of the use needs should govern the approach instead of extrapolation from the present level of use of different forms of energy.

Blindness to N-Power's Longterm Negative Energy Out put

Then, nuclear energy. It is often proclaimed as the solution to the energy crisis. But nuclear scientists have so far been evading an answer to the criticism that nuclear power would have no chance if the criterion of net energy output is applied to it. Some internationally known energy specialists have expressed the opinion that if all the energy expenditure in the series of process—i.e., in the search for, and mining of, a uranium ore; transportation and refining of the ore; making of pellets, fabricating and transportation of fuel rods, the construction and operation of nuclear power plants and the spent fuel reprocessing plant—are taken into account, and to these are added the likely energy expenditure on the ultimate disposal

of the radioactive wastes and also on the surveillance over burial sites of the decommissioned plants for a quarter million years, then, the picture that will emerge is a net deficit balance of energy. George Wald, the grand old man of science and Nobel Laureate of vintage, says that only a country which seeks to invite energy bankruptcy in addition to financial bankruptcy, would opt for nuclear power. Accidents like Chernobyl and Three-Mile-Island would necessitate multiplying fortifications and safeguards at greater sacrifice of energy.

Yet, nuclear scientists are going the same way. The twin benefits from fast breeder—namely, the yielding of more energy than is consumed by it; and the minimisation of plutonium content in the wastes from non-breeder reactor—are being advertised. It will be interesting to know which of the dozen fast breeder reactors in the world have produced how much power and for what length of period. Nuclear scientists all over the world have adopted one tactic. Since they do not have any valid answer to the problem of radioactive waste disposal or to the problems posed by the intensely radioactive fuel for breeders (too high in fissionable content to be handled without criticality accidents), their stock answer is that science will solve all these problems in future. *This is the return of 'mythologisation', which science had promised to dispel.*

Bioscience Derailed

Reductionist 'modern' science has acquired a tendency to seek ways which are grandiose and expensive. Bio-science had once roused the hope that by new insights into biological processes, it will give mankind some inexpensive means to solve the problems of life and living. It has now taken the road to biotechnology based on industrial processes, which would necessarily be expensive. A geneticist produces an organism for skimming oil spills on the sea and this is advertised as opening new possibilities of science, obscuring two vital truths—(i) that this very mode of science and its technological arm has been causing the extinction of untold numbers of plant and animal species every year; and (ii) that since man cannot direct co-evolution of the other species, none is in a position to anticipate the effects that the genetically engineered species will produce.

Reductionist medicalism has been causing widespread drug-induced diseases. Drugs in many cases have saved lives immediately but this longevity has been at the cost of a vegetable-like existence drained of vitality.

IX. HOLISM IN SCIENCE GIVES CLUES TO HIGHLY BENEFICIAL SIMPLE TECHNIQUES

Salvage lies in holism—the understanding of Nature in its wholeness. Superior understanding gives the ability to produce high-social-

efficiency simple techniques. Complex machines and gadgets are low-social-efficiency technologies. Products of mechanistic understanding, these merely reflect the urge to overwhelm Nature or overwhelm other people.

The 'dew-point techniques', which yields potable water in hundreds of thousands of ditches in Israel by tapping the water vapour floating in the desert air during nights was the result of superior understanding of energy exchange between the earth's surface and the atmosphere. The latest technique of focussing sunlight directly on molten carbonate salt cascading down a wall to convert solar heat into electricity (and then, to recycle the salt) is another example of deep understanding. Capable of decentralised harnessing in remote villages, it has tremendous implications for people's lives. With deeper insights into nitrogen fixation in abundance by natural agents (ferns, algae and the edible legumes known and yet unexplored), the currently ruling high pressure megatechnology for chemical fertiliser will be redundant and along with it, most of the lethal pesticides.

There are infinite possibilities of science now given to reductionism, seeks to combine with holistic studies and people's observations. The inspiration for this will come only when the philosophy of conquering Nature yields place to deeper understanding of Nature in its bounteousness and when the goal of power is replaced by love—for the people and for the knowledge which fills the mind with the wonders of creation.

The philosophy of integrating reductionism to holism has to be based on the understanding (i) that the whole is contingent structure which is in continual interaction with its own parts and with the greater whole, of which it is a part, and (ii) that neither the whole nor the part completely determines each other.

X—PEOPLE-ORIENTED SCIENCE AND TECHNOLOGY IS BASED ON NATURAL PRINCIPLES OF RECYCLING, ANTIBIOSIS, SYMBIOSIS AND DIVERSITY

Since recycling is Nature's cardinal principle, developments which are based primarily on renewable resources are the most beneficial and enduring. Resources which are biodegradable must be recycled: otherwise, the life-supporting biogeochemical cycles will be disrupted, leading towards extinction of life on earth.

The principle of recycling demands that since we take nutrients from the soil through the plants we must give back to the soil our bodies' waste products in a form which is beneficial to soil. Even if a country had one hundred times the petroleum reserves of Saudi Arabia, it would still need

to put into its soil the composted waste products to replenish the soil. It is for this reason that a Nobel Laureate in bio-science once said: Mankind may perhaps survive atom bombs but it will not survive flush toilets". This is because flush toilets deprive the soil and break the biogeochemical cycle.

Microbial treatment of waste water for re-use is being practised in many countries. This is an example of recycling.

In the same manner as recycling is a fundamental principle, symbiosis and antibiotics, too, are Nature's basic principles. Cropping of cereals or other kinds of crops with legumes and growing food for humans and fodder for cattle are examples of symbiotic relationships yielding a larger food package. Paddy culture, fish culture and duck rearing can be practised simultaneously on the same farm, with improved result for each. In Auroville, algal culture and fish culture in a nutrient medium of human and animal urine and sea salts in a fresh-water shallow pond, stirred continuously with wind-driven paddles, and chicken rearing yielded several times the per acre production, which was also superior in quality. This gave the lie to the propaganda that resort to chemicalised farming is unavoidable for feeding the hungry population.

The neem derivatives, which have now been found effective against 123 species of insect pests are examples of application of natural antibiotics. Control of mosquito larvae by fish which feed on them is another example of natural antibiotics which is also known as biological control. The U.S. journal, *Environment*, some years back, published a story from the report of a U.S. delegation to China, which provided a classic example of biological control in China. The "Big Sand" commune, in 1971, had consumed 77,000 kgs of broad-spectrum (i.e., 'total kill') pesticides. Next year, a local institute reared 22,000 ducks and let them loose in the paddy fields. The ducks did more than nine-tenths of the pest-devouring job so that only 7,000 kgs. consisting of various target-specific pesticides were found necessary in 1972. If, instead of monoculture, diversity of crops had been introduced, the need for chemical pesticides could have been eliminated altogether.

Thus, farmyard manuring; composting of plant, animal and human wastes and their application on the fields to improve soil organic matter; culture of nitrogen-fixing algae, ferns and trees; excavation of ponds, in the cropfields to capture the run-off soil and recycle it to the crop lands; creation of permanent forest belt in every village as the foster mother of agriculture; intercropping/mixed cropping; simultaneous algal culture, fish culture, poultry farming/duck breeding; windmill for power for irrigation; desilting of rivers and deepening of canals and tree-lining their banks; biogas plants in every household; generation of electricity in villages from

solar ponds and by other devices; manufacture of solar cooker, solar heater and drier in the villages as cottage industries; dairy production; agro-industries and small industries for production by the masses for their own consumption—all these are related to the principles of recycling, symbiosis and antibiosis. These have the potential of providing full employment while improving the production base.

Once people resolve to shun chemical fertilisers and pesticides, turn their back on grandiose plans for big dams and trunk canals and seek to emulate Nature's own technology in its many-sided interconnectedness, new avenues will keep opening up. Once the philosophy is adopted (i) that most jobs can be performed in low speed and medium speed transportation and high speed is needed only for special cases of urgency and (ii) that low-speed transportation coupled with high-speed communication is both healthful and equitable, a new perspective will open up. Similarly, when it is realised that high-concentration energy is high-entropic, socially inequitable and injurious to both individual and community health, the longing for renewable forms of energy (biogas, solar and solar-related energy which are also low-concentration energy) will grow. Once it is accepted that large-scale industries are dehumanising (as Mahatma Gandhi said) and that large manufacturing industries based on sub-divisions of labour are the assassination of a people (as Karl Marx said), the urge for human-scale industries and technologies will grow. This will be in harmony with mankind's physical environment. This will also be harmonious with Nature.

XI—CONCLUSION

NATURE-HARMONIC pursuit of knowledge can save life from extinction, bring about a renaissance in science and open up common people's access to resources. This can make possible a five-tier federalism, embodying people's self-governance at village and block levels. This can make participatory democracy at these two levels the foundation and the pillars for the superstructure of representative democracy at the district, state and federal levels and proclaim the sovereignty of each level in its defined sphere. (Participatory democracy could never take shape when the locale is made overly dependent on external inputs, as it is now for agrochemicals, for irrigation water from big dams, and for electricity generated afar). Villages, based primarily on local ecological resources, with facilities for global communication can be the real global units.

This harmony of the local and the larger communities (as distinct from dominance by the so-called Centre), harmony of man and Nature, of individual existence and cosmic consciousness—based on the recognition of organic relationship with all creation, animate and inanimate—is the key to man's freedom and self-fulfilment.

Some Gandhian Elements in Gorbachev's Vision

By : Dr. J.D. Sethi

AS a Gandhian I have no illusions about the Soviet Union. The global order dominated by giant nation-states, no matter what their social systems, cannot guarantee peace. If "Large Is Ugly" applies truly to any order, it is the modern nation-states including the US and the USSR, China, etc whose size, control of resources, military power inexorably push them to rivalries, militarisation, proxy wars and to fear. According to Mahatma Gandhi, there will be no peace unless there is either a world government, or world federation of nations or unless big nation-states are broken into smaller-size states.

Yet I find something quite extraordinary in what General Secretary Mikhail Gorbachev is saying or doing. I detect serious Gandhian elements or concepts in his general approach. I do not think Mr. Gorbachev has studied Gandhi but, if he does so, he can enormously profit from the study.

Probably I have another compulsion. Years of crisis have convinced me that the time is ripe for serious dialogue between the Gandhian and Marxist scholars. There are many good reasons for this dialogue but I will cite three most critical ones.

First, a lot of Marxism has been eroded by the structural changes of modern industrial societies. Hardcore Marxism is still relevant and there is a danger of the baby being thrown out with bath-water if the Soviet society is pushed to catch up with the Western capitalist values. On the other hand Gandhi's ideas which were submerged are emerging as more relevant for the future.

Second, on many issues while the differences between them cannot be ignored, Gandhi and Marx seem to converge. This is no place to dilate upon these issues, but they are there for any serious scholar to discover.

Third, it is the time, the place and the man. What Mr. Gorbachev is attempting to do in the Soviet Union by changing the very principles and practice of social transformation seems to echo Gandhi.

Mr. Gorbachev can be safely described as the most radical reformer of the post-World War II period. Besides, whosoever has come in contact with him agrees that he is a man of charm and intelligence and above all, a man of integrity, something which cannot be said of most Soviet leaders,

past or present. What he is attempting in the form of Glasnost and Perestroika is not merely removing the shortcomings and evils in the Soviet society and reforming it on the lines of Lenin's principles. He is laying down entirely new principles which no Marxist inside or outside the Soviet Union ever dared to pronounce for fear of being denounced as revisionist, Trotskyite, vulgariser of Marxism and what not.

The first and probably the most important Gandhian element in the Gorbachevian approach is his insistence on and tremendous respect for truth. In a society in which truth was defined as class truth and which practised propagandist truth or untruth over a long time, this is quite remarkable. When Mr. Gorbachev promised that he would fill the blank pages of history, he was promising that all the distortion and untruth of the past will be exposed. If one is not truthful to history, one cannot be truthful to the present and the future.

Some time ago, there was an article by Bertuzher - Lada entitled "Truth and only Truth : Thoughts of A Sociologist on the Tragic Pages of Our History and About Opponents of Perestroika". This article had the approval of Gorbachev and it created a stir in the Soviet Union as it made an uncompromising demand for restoration of truth by exposing the misdeeds and brutality of the Stalin-Brezhnev regime. This was echoed by the Soviet historian, Mr. Afanasyev, Rector of the State Archives, who remarked, "No other country has such falsified history as ours". Such statements have now become quite common. Mr. Gorbachev himself has used the strongest words for emphasising the necessity of truth because, as a student of history, he knows and says, "We know only too well of the evil that can be produced by a conscious or unconscious falsehood".

He is proving true to his words. Not only has he rehabilitated many old comrades of Lenin who were denounced and even executed by Stalin on false grounds, but he is throwing open Stalin's every cupboard which is full of skeletons.

The latest revelation that 4,000 Polish officers were murdered on Stalin's orders, a fact which was earlier attributed to the Nazis, reveals Mr. Gorbachev's total commitment to truth. Unless something extraordinary happens to reverse this process or Mr. Gorbachev is thrown out, he would have changed the whole course of debate not only of the society but of entire international relations.

Second, when Mr. Gorbachev signed the Delhi Declaration in 1986 the word *non-violence*, was specifically used in that declaration and since then has been constantly emphasised. It came as a surprise to most people, and many saw it as part of new Soviet propaganda. It is not that Mr.

Gorbachev has become a follower of Mahatma Gandhi, but if one believes, as Mahatma Gandhi did, that anyone in search of truth would also become a votary of non-violence, the belief is sheer common sense and logical.

Mr. Gorbachev has given more than a dozen unexpected concessions to the US on those strategic issues in respect of which Moscow held an inflexible approach for a long time, in order to arrive at a situation where genuine disarmament was feasible. One may argue that the INF agreement is no guarantee for future disarmament but, with the INF Treaty, there would be new hope for disarmament. It would be undesirable, wishful thinking that a giant nation with the mightiest military machine can allow her leader to be a votary of non-violence; but, if non-violence is accepted as one of the basic principles of international relations, it will correspond to Gandhi's philosophy of one step at a time.

Third, it is not only non-violence with which Mr. Gorbachev is grappling, he is also struggling with another Gandhian concept. More than once he has said that Socialism without morality will never succeed. So far the Marxists all over the world have been totally unconvincing on problems of individual and social morality. They were prepared to talk about socialist legality but not morality, though both were violated. Mr. Gorbachev has openly challenged Soviet Marxists and intellectuals to realise that there was no separation between the two.

In his own words : "A policy devoid of scientific basis is bound to vacillate and make errors. We know this from our own experience. But a policy not resting on morality can cause, I think, no less harm. And we are aware as well of what this led to". Morality is morality, it is neither bourgeois nor socialist nor Gandhian.

So far, the official Soviet version of philosophy of ethics had been as follows : "Marxist ethics (if there is such a thing) rejects the doctrine of moral law as a category outside the classes and history." Further "The character of morality is determined by the economic and social order, its standards reflect class interest". "Finally, the objective criteria of communist morality to avoid factoring of the communist society" ('Soviet Dictionary of Philosophy'). Mr. Gorbachev has rejected it, though not entirely and very explicitly. He seems to accept universality of morality as Gandhi did.

Mr Gorbachev's book on Perestroika is a documents of profound significance. No one would have dared to produce it in the Soviet Union, let alone a General Secretary. Apart from the fact that it has jolted and shaken many old bureaucrats and party hacks in the Soviet Union, it has also made many Marxists and pro-Soviet scholars in other

countries—who have been supporting every internal Soviet policy right or wrong—look absolutely silly.

Mr. Gorbachev has been frank enough to say: "Our discussions some time lack political culture, a policy to listen to each other and to do scientific analysis of social process." This is a clear admission of lack of academic freedom. He has particularly pointed his finger at those who use radical phraseology but in its garb are sabotaging the policy of Perestroika.

Although Karl Marx had put a large emphasis on democracy and morality, the Soviet and other Marxists, including Lenin, have deviated from the Marxist theory to suit the Soviet conditions. Let alone other Marxists, even Lenin talked about class morality. He openly advocated the case of untruth in the cause of working class without realising that untruth could rebound on the class itself. Such approach led to violation of truth and legality and also became a source of denial of human rights.

When Mr. Gorbachev talks about "pluralism of opinion" as food for thought and "the basis for understanding things better" he is throwing away the old baggage. In philosophical terms he is re-establishing the old principle of relativism, both of fact and value, thus throwing away the principle of absolutism. It is applications of this principle of absolutism that eroded the Soviet cultural life which was once the richest among the European nations before the revolution.

Mr Gorbachev has both committed himself and shown it in practice that he is giving up the old communist methods. He says that the road to socialism will succeed only "by using methods more by humanity, trust and respect". This is beyond dialectics which, in Gandhian terms, is called *parallellogramatics* which must coexist with dialects.

In fact, he keeps reminding his party men "that they should foster the genuine, wonderful meaning of the great word 'Comrade', restore the spirit of comradeship in the party and society". The Soviet state and its coercive organs, particularly the KGB, have been notorious in the use of violence against not only the dissidents but even against honest citizens. Glasnost has reduced the threat of violence.

Mahatma Gandhi once remarked that political struggle since the French Revolution had been confined to the struggle between liberty and equality. He reminded the people of their neglect of the third of the trinity of the French Revolution that is fraternity, which means trust and compassion. Both Mrs Margaret Thatcher and President Ronald Reagan

are putting emphasis on morality but there is not one word of compassion in their speeches or actions. Mr Gorbachev keeps telling his comrades that, without trust and compassion, socialism will not succeed. In this respect what Andrei Sakharov has said in support of Mr Gorbachev is of profound significance.

Dr Sakharov told an unprecedented official Press conference on 3 June: "I am very worried about the opposition to Perestroika. The role the regional party committees are playing in excluding well-known and radical supporters of reforms from this month's party conferences, is a direct attack on Perestroika. Gorbachev's policy is very serious and deserves trust. We should even give him some trust in advance because I believe he is trying for more progress on human rights."

Practically in every speech on Perestroika, Mr Gorbachev never fails to mention that it means "more democracy and more socialism". On the face of it, the statement is quite catchy and appealing to the faithful, but in reality he has not spelt out what he means by the phrase "more socialism and more democracy". He has certainly not explained how more of both in their accepted definitions go together. Probably, we have an answer in what he is saying about the Soviets.

For, fourth, a very significant change that Mr Gorbachev is proposing is to give power back to the Soviets. Without the Soviets there would have been no revolution and it was the destruction of the Soviets by Stalin that transformed democratic centralism into bureaucratic dictatorship. There is nothing in the Soviet Constitution or political system which can ensure political participation of the people in the decision-making. A large number of leaders in the Soviet Union had earlier spoken about democratisation, but no one was able to suggest the meaning, the content and the direction of the change. It has not been noted by many that Mr Gorbachev intends to bring the Soviets, an institution of decentralised democracy, back into the mainstream of Soviet politics.

In the Twentieth century, only three models of decentralised democracy and participation have been put forward: the Soviets in the USSR, the Communes in China and the Village Republics of Mahatma Gandhi. The first brought about the revolution, the second laid the solid foundations of the Chinese society. The first two have been swamped by centralised state and bureaucracy. The third was never given a chance to be practised. The panchayats were not given real powers in India. Without these and similar such people's organisations, there is no chance of democracy at the bottom, particularly in countries which have authoritarian structures at the top. Therefore, when Mr Gorbachev says

that "there can be no democratisation of society while the Soviets are not involved in the process", he is emphasising a point of historical necessity on which Lenin, Mao and Gandhi converged.

The significance of the Soviet is not political but economic as well. The approaches of command economy or commanding heights of the economy, as admitted by Mr Gorbachev, "have undermined the capabilities of the Soviets to benefit the people. The dwindling roles of the Soviets gave rise to what we see as replacement of the functions and the activities of Government and administrative agencies by those of party agencies".

Mr Gorbachev realises that democratisation is not going to be easy. That is why he proclaimed: "Democracy has acquired an acute form at times." Someone objected that it would be difficult to work in an environment where "each individual is his own philosopher, his own foremost authority, and believes only he is right." He replied that "far worse would be dealing with a passive intelligence, and with inability and cynicism".

Mr Gorbachev says that he is fighting against the "psychology of dependence". People must be prepared to think and express themselves. That is why he calls Glasnost and Perestroika a peaceful and democratic revolution and sets the ideals of spiritual and moral regeneration. This cannot happen in an atmosphere of dependence, fear and passivity.

Fifth, for those who believe in scientific explanation of everything, and this includes Marxists, spontaneity is a subjective factor and, therefore, has to be avoided. One of the important aspects of Perestroika is that it is a spontaneous outburst of repressed aspirations. Gandhi believed that spontaneity is essential. Mr Gorbachev has to go a long way to turn spontaneous support for Perestroika into all-round policies and it is here that he is facing the maximum opposition from vested interests. Mao Tse Tung went to the other extreme of relying on spontaneity for his Cultural Revolution and gave up whatever was scientific and humanistic in the Marxist approach. He was defeated by his own strategy and arrogance. The Cultural Revolution was the biggest failure. Mr Gorbachev is treading a very delicate path between the two extremes.

Sixth, in respect of economic development, the Soviet Union is one of the poorest countries in Europe in terms of per capita income. Militarily, it is more powerful than even the United States, let alone Western Europe. In fact, after 70 years of revolution, the Soviet citizen is deprived of some of those elementary goods which are found in abundance not only in the advanced capitalist countries but even in some Third World countries. In fact, in a certain economic sense, the Soviet Union is more

like a Third World country. Mr Gorbachev is attempting to redeem the socialist promise of giving every Soviet citizen a decent standard of living, and that he cannot do without dismantling a large part of his unproductive military and bureaucratic establishment. He is carrying on relentless struggle against the Soviet bureaucratic-military complex which is the counterpart of military-industrial complex of the United States.

The world will never be safe from wars and violence unless these two complexes are destroyed. President Reagan over the last seven years has further strengthened this complex. One hopes that the US Administration will respond more specifically and positively to the Gorbachev attempt to reduce the power of the Soviet bureaucratic military machine. Few people have noticed that Mr Gorbachev has made a drastic change in the Soviet military doctrine. He has substituted *sufficiency of Defence* in place of earlier doctrine of *Equality*. Sufficiency is not a Gandhian principle but a genuine socialist principle. It, however, marks a big change towards defensive as against offensive defence.

Seventh, probably the most significant and welcome change that Mr Gorbachev is suggesting is a shift from the Leninist concepts of *strategy and tactics* to the Gandhian concepts of *ends and means*. Many untruths and crimes were legitimised in the name of the former. A new realisation seems to be setting in. The 23 May Plenary Meeting of the party unmistakably stated: "We are by no means indifferent not only to goals and values of socialism but also to *means* of attaining them, to the human price that has to be paid for them." The crisis of all modern societies lies in their neglect of means on which Gandhi based all his philosophy and which the Marxists ignored to their own serious disadvantage. If for no other reason, for this alone, Mr Gorbachev deserves to be studied.

Finally, the widely appreciated characteristic of Mr. Gorbachev's personality which has emerged slowly is that he is a man of enormous courage and fearlessness. That, again, is something Gandhian. He knows that he can be thrown out by the obstructionist old guard, old party hawks who live on privilege, the state machine which has become rigid, repressive and also greatly unproductive. But, Mr Gorbachev is not resting on his oars and relaxing. Any other man would have compromised out of fear, or in order to save his skin. Vulnerable as he is, and being attacked from inside his own country and outside in the capitalist world, he is taking up the challenge of both with courage and dignity.

The same characteristic he is also showing in his generosity in dealing with adversaries. The American Right, like the CPSU Right, are betting on the failure of Gorbachev. It is, therefore, necessary that all

Gandhians should study him to see whether reversal of Perestroika would not mean a new cold war.

There are many other statements of Mr Gorbachev which one can quote as reflecting real superfluous Gandhian principles, but the simple and telling fact that he is trying to inject into the Soviet society leadership principles of non-violence, true morality, trust, compassion and so on. This is more than one revolution at a time. This is unprecedented.

By emphasising again and again the need for morality, conscience and truth as against the old-fashioned slogan of socialist legality, socialist realism etc, Mr Gorbachev is making history. In his own words: "It is through Perestroika that moral potential of our society has been set in motion. Reason and consciousness are beginning to win back ground from the passiveness and indifference that were eroding hearts".

To many old fashioned Marxists, too, my analysis will be unacceptable. They need not yield to my pleas but they need to reflect on them. For me, Gandhism is an anti-thesis of both Stalinism as well as Leninism, but it is not so in respect of core values of Marxism. In the final analysis, Gorbachev's success will be in defending those core values in terms of what Gandhi called the eternal truths and in the context of what I see are Gandhian elements in Gorbachev's vision.

—Hitler as Communist Ally—

Dimitri Manuilsky, Referee for German Affairs in the Communist International, put it at an executive committee meeting in Moscow, on December 15, 1931, thus:

"Our principal enemy is not Hitler. The main enemy is rather the system, Severing, Bruening, Hindenburg. With his (Hitler's) help, we shall first smash the Social Democratic Party, then the Bruening administration in the present stage of development of the German revolution, Hitler is indisputably our ally."

From "A Basic History of Germany" (P. 147)
by

Hubertus Prince zu Lowenstein
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*Ek dev, Ek desh, Ek bhasha
Ek Jaati, Ek Jeeva, Ek asha*

(One God, One Nation, One Language,
One Race, One Form, One Hope)

—Veer Savarkar

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