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## From the Annals of the Laboratory State

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### I. On the nature of violence in modernity

Joseph Conrad was one of the great students of modernity as violence. In his *Nostramo*<sup>1</sup> and *The Heart of Darkness*,<sup>2</sup> he showed how Western man had constructed the savage as the other in order to impose his own savagery on him. The jungle became the theatre of that enactment. Conrad's novel, *The Secret Agent*, is a study of anarchist violence in England at the beginning of this century. It is an analysis of terrorism as faith, an unravelling of the belief that one act of violence can literally erase bourgeois society.

In a fascinating passage in the novel, the first secretary of the Russian embassy explains the logic of violence to the anarchist, Verolac. He remarks that the power of terror should not only reside in the physical impact of the bomb, but should spread further through the symbolic aura it creates. An ordinary bombing, he explains, is as banal as class hate.

But what is one to say to an act of destructive ferocity so absurd as to be incomprehensible, inexplicable, almost unthinkable; in fact, mad? Madness alone is terrifying, in as much as you cannot placate it either by threats, persuasion or bribes. Moreover I am a civilized man. I would never dream of directing you to organize a mere butchery. I wouldn't expect from a butchery the result I want. Murder is always with us. The demonstration must be against learning-science. But not every science will do. The attack must have all the shocking senselessness of gratuitous blasphemy. . . . It would be really telling if one could throw a bomb into pure mathematics . . . what do you think of having a go at pure astronomy?<sup>3</sup>

The secretary asks the agent to blow up the Greenwich observatory, the custodian of time. 'The whole civilized world has heard of Greenwich. The very boot-blacks in the basement of Charing Cross station know something of it.'<sup>4</sup>

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Conrad presents the act as a senseless one. He does not explore the possibility that science itself could be a mode of violence or tyranny. He failed to grasp the possibility of a lonely tribal striking a futile blow at Indian Standard Time or at the glass-encased Standard Metre. The anthropology of the act eluded him.

The iconography of the act provides the justification for this essay. It involves, I believe, three separate statements: (1) the realization that science could encode a structure of domination and violence; (2) the violence of science is not a pathology confined to the fringes or the frontiers such as atomic physics or genetic engineering; it is a pathology which resides in the banality of its everydayness; and (3) the act of protest inaugurates, what has been called, the insurrection of the little knowledges. One must interpret all three statements within the wider framework of the history of science.

I contend that historians of science have been maintaining two parallel sets of registers. There are, first, the textbook histories depicting science as an impersonal method which elevates the idea of order to a collective truth. Accompanying this is an act of bracketing and ritualized separation. Theories like racism in anthropology, orientalism in linguistics, IQ in psychology, social Darwinism in political economy and biology are bracketed off as 'pseudo sciences' or as distortions of normal science. I suggest an alternative explanation. The marauding genius of science needs these spaces provided by these 'pseudo sciences' for the free play of its imagination. These spaces constitute an integral part of the scientific project. Marking them off saves science as a phenomenon but contributes little to our understanding of such events. It does not explain why they recur so often in science.

One can see the same trend in the modern discourse on development. Development is a scientific project; it represents the contemporary rituals of the laboratory state. As a project, it is composed of four theses ingrained in the logic of Western science, and in the concept of modernity as technocracy:

- (i) *the Hobbesian project*: the conception of a society based on the scientific method;
- (ii) *the imperatives of progress*: the legitimation of the use of social engineering on all those objects labelled 'backward' or 'retarded';
- (iii) *the vivisectional mandate*: the transformation of the other into an object of experiment in which the infliction of pain is justified in the name of science;
- (iv) *the idea of triage*: the combination of the concept of rational experiment, the concept of obsolescence and vivisection—whereby a society, a subculture or a species is declared obsolete and condemned to death because 'rational' judgement deems it incurable.

Development as a technocratic project includes all four themes. In effect, they are tantamount to death warrants, and they should be regarded as genocidal in intent. I discuss below the evolution of these concepts.

## **II. The Hobbesian problem of science**

The genealogy of modern science is often traced to the tracts of Bacon and Descartes. They were no doubt influential, but the triptych was complete only

with the work of Thomas Hobbes. If Descartes captured the philosophical implications of the machine as the basis of an imagination, and Bacon the rules of the experimental method, Hobbes complemented them with the conception of a society based on the scientific method. Bacon's scientific utopia, the *Novum Organum* (1620), on which the Royal Society was based, was less grandiose and totalitarian than the Hobbesian *Leviathan*,<sup>5</sup> which haunts us to this day. Bacon's conception of Solomon's House was more cautious. The Royal Society merely sought a charter for a bounded association within a wider society. The Hobbesian state was a scheme for science as society. Both were critiques of the intellectual dominance of Aristotle, but Hobbes' attack was more mordant. In fact, the early members of the Royal Society condemned Hobbes for his lack of caution.<sup>6</sup> Because of this blatancy, the Hobbesian project is important: it forges links between science and power; it links science integrally to the issues of fear, death, terror and violence. The charter of the Royal Society is an attempt to wish away this problem. In an open declaration about the dualism of knowledge and power, the charter clearly states that problems of politics are beyond its ken.

For Hobbes, modernity demands a movement from the state of nature to civil society. His description of the state of nature is not so much an historical as an analytical account with historical nuances. The state of nature, to Hobbes, was a state of anarchy: a chaos of meanings, emotions, dreams, fantasies and hallucinations. It encapsulated the factionalism of religious strife, of the divisive heresy of Levellers, Diggers and other inner-directed groups. Like the society of his time, the state of nature was one of rampant disorder where

every man is enemy to every other man. There is no place for industry, no culture of the earth, no navigation, no instruments for moving, no knowledge of the face of the earth, no account of time, no arts, no letters, no society.<sup>7</sup>

With no science and no society, 'The life of man is solitary, poor, nasty, brutish and short.'<sup>8</sup>

To combat this condition, civil society, which is rational, scientific, stable and ordered, is conceived. The axiom on which rational society is constructed is that the sovereign or the state has the monopoly of terror and of man-made instruments of death. Modernity as society is inaugurated, not merely through a contract, but as a theorem, a Euclidean list of propositions which makes society possible. Science, thus, colonizes society at the very moment of inauguration, by conceptualizing it and by policing it. Both the scientist and the sovereign are prior to the Hobbesian polis. Society is based on the violence of the sovereign, but repeated violence makes society uneconomical. To the fear of death is therefore added the structure of quietude, of monolithic order; and that is the role of science.<sup>9</sup> The state as the source of ultimate power does not antedate science; it is coeval with science. In that sense, science is the civics of the Hobbesian world. To be is to be scientific and to become in every sense of the term a subject and citizen. Science is the grammar of power, and violence of the state becomes a symptom of the breakdown of science. It is in this context that Hobbes examines the problem of sedition.

For Hobbes, sedition is irrational and unscientific. Sedition is any language that does not conform to the rules of science. Included in it are such beliefs as primitive Christianity, Aristotelianism, occult science and all the other bacchanalia of the mythopoetic imagination. Also include in this list are all ‘fancies, imaginings, passions, expressed in metaphor, poetry, or other imprecise and extravagant modes of speech’.<sup>10</sup> For Hobbes, science provided a mathematical precision of language which made order eternal. The sovereign recedes before the eternal order of science; he becomes a referee, a Hessian Magister Ludi, but one with enormous power.

The Hobbesian project has been the great dream of modern man. It underlies the logic of all technocratic totalitarianism—whether that of Lenin, Stalin or the new laboratory states of the 20th century. Locke’s social theory was merely an attempt to moderate this scientific urge. Locke posited a distinction between political and scientific communication. Political society, Locke felt, had not reached the clarity of the scientific discourse.

Modern society has oscillated ever since between the Lockean and Hobbesian visions, the movement always being toward recovering the frictionless world of Euclidean politics. The violence of modernity arises not merely from the violence of the state but from the violence of science seeking to impose its order on society. In fact, through a strange twist, the modern state exists more and more as a big machine guaranteeing the production and reproduction of science. In fact, it is the grammar of science that provides for the everyday fascism of modernity-as-technocracy. Let us now move to the next concept, progress.

### III. Progress as a mandate for violence

*I saw them bury a dead child  
In a cardboard box  
(This is true, and I don't forget it)  
On the box there was a stamp.  
'General Electric Company  
Progress is our Best Product'*

LOUIS ALFREDO ARRAGO  
(Guatemala) 1967

Modernity was a vision of conquest. Every structure of conquest needs a calendar as a liturgy of its power. It has therefore to capture or to rewrite time, since time till the emergence of modernity was cyclical and hence open to reversal. Therefore, the first project of modernity and of modern science was to escape from their own pasts, from the traditions of Christianity and Aristotelianism. The mediaeval cyclical theory of time, which allowed for decadence and reversal, yielded to a linear, irreversible notion of time. The time of modernity has gradually become the time of the world. The logic of imperialism and the logic of modernity shared this common notion of time. Bernard-Henri Levy states this succinctly:

The Greeks did not invent imperialism, because they believed in geography and lived with the illusion that there were scattered and

peculiar times, appropriate for each substance and each particular place. The Athenian configuration was not and could not be imperialist in our sense of the word, because its supporters thought time did not exist and that Thebes, Athens and Sparta each had its own chronology, almost like substance. The moderns, on the other hand, were able to invent the idea of empire because they no longer believed in nature or geography, but in infinite uniform and homogenous space reduced to a single law of identical temporality.<sup>11</sup>

However, modernity, which had escaped from antiquity, still had to confront the 'other'—both 'other' as civilizations and 'other' as tribe. What were these other societies which were juxtaposed or located along the same, contemporary space? The answer that evolutionary theory gave can be read in the collective representation called the museum.

The museum is an act of classification where artifacts are juxtaposed to each other in a logico-spatial manner.<sup>12</sup> One can witness even now exhibits on technology or cognition arranged in the following way. One 'sees' the primitive canoe or spear. Next to it is arranged the sailing ship or cannon and the exhibits eventually culminate in a submarine or tank. What is a logico-spatial order is then read as a time series, where each exhibit is literally seen as evolving into the other. Progress is defined as the ordained linear movement across this sequence.<sup>13</sup> This is the basic assumption underlying the law of stages, present in the work of Auguste Comte (1798–1857), Karl Marx (1818–1883), Herbert Spencer (1820–1903) and all the other evolutionary thinkers and scientists.

As a result, other civilizations or tribal cultures are seen as 'contemporary ancestors', the past the West has already lived out. The West, the modern West, is in turn the future these societies will encounter. The museum thus becomes an index of the map of the world, a taxonomy identifying cultures in time. One is forced to confront the violence encoded in this innocent bit of anthropology:

A society with a hunting culture is more primitive and less evolved than one with a hoe culture or simple pastoralism; and these in turn are more primitive than one with industrialization.<sup>14</sup>

Implicit in this model of progress are several sets of implications:

- (i) The increasing accumulation of science is seen as a sign of 'grace'. The West is seen as paradigmatic of scientific and technological culture.
- (ii) The West as modernity obtains the mandate of power and responsibility over this world left behind by history. It is science as the modern man's 'gaze' that brings the primitive and the archaic back into contemporaneity. It is science, once again, that must aid in their march to modernity. In the meanwhile, the primitive and the archaic become the objects of the experiment, the programme called modernization.
- (iii) Progress and modernization as scientific projects automatically legitimate any violence done to the Third World countries as objects of experimentation. The classic example is that of Marx who justified the

British colonial presence in India because it triggered India's movement towards modernity.

Historians of science tend to condemn the notion of progress, the evolutionary law of the three stages, as 'pseudo-science'; they bracket it off as an aberration of science or as a discarded paradigm. Such an act of erasure will no longer do. To use an analogy from science itself, although it is well known that Einsteinian physics encompasses the Newtonian paradigm, yet the scientists and technologists operate with it in many spheres; the superseded paradigm is never bracketed off as pseudo-science or considered as irrelevant. The schemata of progress and evolutionism operate to this day in the policies of modernization and development, where states are imposing the inevitability of development on reluctant cultures. Neither the action of the states nor experience of the cultures can be explained away as the unfortunate products of a pseudo-science.

#### **IV. The scientific experiment as a mode of violence**

The experimental method, so crucial to modern science, is not only a system of political controls but it incorporates a unique mode of violence: vivisection. Within such a framework, the laboratory becomes a political structure and the basis of a wider vision of society. One can illustrate this with reference to the development of public health in India.

In September 1896, plague struck Bombay and its surrounding areas; it raged without let-up for 12 years and eight months, taking a toll of thousands of human lives. Today, it is remembered in medical history, and in commemorative stamps, as a tribute to Haffkine after whom the plague research institute in Bombay is named. Within the structure of medical discourse, Haffkine's work is regarded as a convincing justification for vivisection. *The British Medical Journal* announced that Haffkine had arrived in India from the Pasteur Institute in Paris 'to test on man the remarkable results which he had obtained on animals in the laboratory with reference to the cholera bacillus'.<sup>15</sup> The note added that it was struck by Haffkine's enthusiasm for the test.

Simultaneously, there was a plague in Egypt which is now almost forgotten. Sir John Rogers, who was then director general of the sanitary department in Egypt, immediately instituted a series of sanitary measures. Persons found infected were isolated. All persons who had come into contact with the patient were put in quarantine, where they were fed and also compensated for the loss of time. Simultaneously, a whole set of sanitary measures, such as limewashing of infected houses and disposal of garbage within the city precincts, was carried out. The plague in Egypt ended within six months, the eventual death toll being a mere forty-five.

When the epidemic was raging in India, many doctors brought to Haffkine's notice the importance of instituting sanitary measures. But Haffkine represented what the committee called 'the laboratory point of view'. He rejected these suggestions and threw the entire weight of his

scientific reputation to ensure that no sanitary measures were undertaken while his vaccine was being tried out.<sup>16</sup>

Vivisection, the inflicting of pain on 'lesser animals' for the purposes of scientific research, is as old as Galen and Celsus; but it receives scientific imprimatur in the writings of Descartes. When one of his visitors remarked on the poverty of his library, Descartes pointed to the animals he had been dissecting and replied, 'these are my books'.<sup>17</sup> Descartes' books were better than conventional books in that the former were alive. The great methodologist believed that the cry of an animal was not due to pain any more than the creaking of a wheel was due to the pain of the cart. The Cartesian text acquired the status of a textbook in the works of Claude Bernard and Francois Magendie. Bernard defined the nature of vivisection precisely. The organism, he stated, had to be taken to pieces in the same way as a machine is dismantled.

After dissecting the dead, one must go on to dissect the living, to uncover the functioning of those parts that are hidden or concealed. It is the operation of this character that acquires the name vivisection.<sup>18</sup>

The hospital, said Bernard, is only the antechamber of medicine, while the laboratory constituted its sanctum.

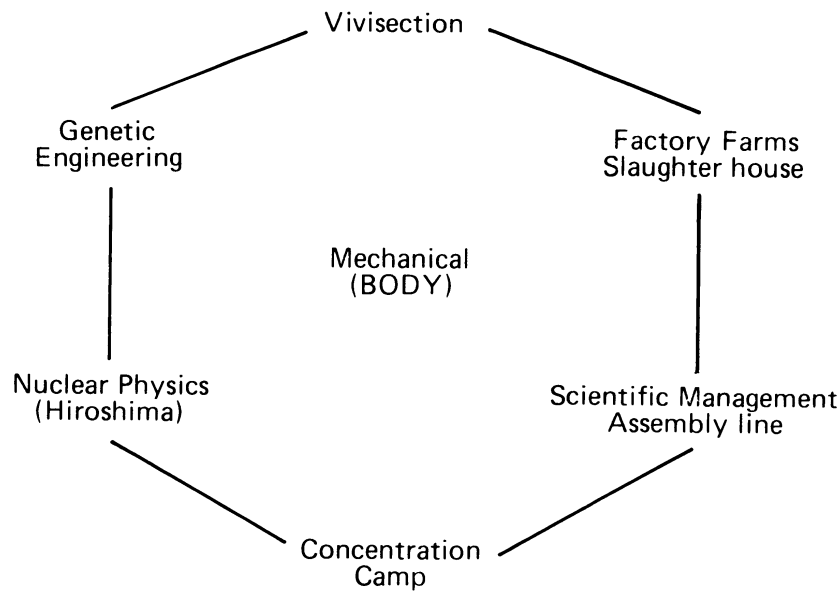
Bernard's work reflected the intrinsic violence of science as vivisection. Vivisection is the infliction of pain for experimental purposes of understanding and control, where pain and suffering are justified in the pursuit of scientific knowledge as an absolute value. Francois Magendie 'sacrificed' 4000 dogs to discover the distinction between sensory and motor nerves. Some of the early vivisectionists might have been sadists, but Bernard exemplifies the schizophrenic attitude of 'normal science' to the vivisectionist violence of scientific method. Bernard remarked that

the physiologist is not an ordinary man: he is the scientist possessed and absorbed by the scientific idea he pursues. He does not hear the cry of animals, he does not see the flowing of blood; he sees nothing but the idea and is aware of nothing but the organism that conceals from him the problem he is seeking to resolve.<sup>19</sup>

It was necessary to quote Bernard in such detail because vivisection, which has acquired a central and permanent status within science, has now become totally banal. The pervasive everydayness of it hides the metaphysical shock one would otherwise have experienced. Today, over a hundred million animals are used up in the pursuit of research, in experiments ranging from hair dyes to cancer research. Peter Singer cites a 1971 survey carried out by Rutgers University which provided the following estimates of the numbers of animals used each year in US laboratories: 85 000 primates; 500 000 dogs; 200 000 cats; 700 000 rabbits; 46 000 pigs; 23 000 sheep; 1.7 million birds; 45 million rodents; 15–20 million frogs; 200 000 turtles, snakes, lizards—a total of 63 million animals.<sup>20</sup> One can add to it now a roll call of patients, prisoners, poor, inmates of old peoples homes, and nameless peasants in the Third World.

The socialization of vivisection in science has been so extensive that even children regard it as a normal part of the educative experience. Gerald Carson cites the example of a child 'who gouged out the eyeballs of house sparrows, punished them with electric shocks when they refused to respond to light. He won a science prize of \$200.'<sup>21</sup>

Opposition to vivisection has usually been dismissed by scientists as sentimentalism. But one must see it as a paradigm for general scientific activity extending towards wider domains of control, incorporating innumerable sets of violence within the genre of vivisection. This scenario is reflected in the following diagram. One witnesses the violation of the body in the search for 'scienticized' production and control. The violation of the physical body soon leads to the vivisection of the body-politic in theories of scientific-industrial development. And these examples are transforms of one another. The vivisectional code underlies and underwrites the violence implicit in all of them.



The diagram tries to show that the scienticization of a problem carries with it the seeds of vivisectional violence. As a concrete example one can begin with scientific management. Modern management has its origins in the vivisection of the animal body. The first assembly lines were developed in the slaughter houses. The meat conveyor belts in the packing industry anticipated Ford's assembly lines. Braverman gives the following description of the slaughter house:

The animal was surveyed and laid off like a map; and the men were classified into thirty specialities and twenty rates of pay, from 16 cents to 50 cents. The 50-cent man was restricted to using the knife on the most delicate parts of the hide, or to use the axe in the splitting of the backbone. In working on the hide alone there are nine positions at eight different rates of pay. A 20-cent man pulls the tail, a 22½-cent man pounds another part of the hide. . . .<sup>22</sup>



The disassembling of the body later became the model for the assembly line. It was only a short step then to the vivisectioning of body motions to establish the basis of Taylor's scientific management. The Taylorist experimental attitude is captured especially in his descriptions of his object of study, the Dutch worker whom he calls Schmidt. Taylor records how he decides to instruct Schmidt in order to determine the mechanics of work. He tells him,

You will do exactly what this man tells you tomorrow from morning till night. When he tells you pick up a pig (iron), you pick it up and walk and when he tells you to sit down and rest, you sit down. You do that right straight through the day. And what's more, no back talk. Do you understand that? When this man tells you to walk, you walk; when he tells you to sit down, you sit down and you don't talk back to him.<sup>23</sup>

Taylor himself admitted that he was surprised to find a human animal so amenable to experiment.

*On animal machines and concentration camps*

The 'Fordification of agriculture' is now reflected in factory farming. The notions of animal husbandry, once common to traditional agriculture, have yielded ground to the notion of animal machines. The writings of Peter Singer and Ruth Harrison have systematically detailed these processes.<sup>24</sup> What appears as ordinary scienticized production techniques reflecting the violence of vivisection, acquires new power in more dramatic cases of vivisection—the concentration camp and the bombing of Hiroshima.

The history of the excesses of the Nazi regime is explained in terms of the individual psychopathologies of Hitler, or the authoritarianism inherent in German culture. Yet, these studies do not fully explain the particular nature of violence as it occurred in the concentration camps. The problem is caught in Fredrick Wertheim's *Sign for Cain* where he remarks:

The mass killings in the concentration camps cannot be subsumed under any of the old categories. It is not bestial, because even the most predatory animals do not exterminate their own species. It is not barbaric, because barbarians do not have such organized, planned advanced techniques for killing people and processing them into commercial fertilizers. . . . It was not the work of mad men, for many of the perpetrators and organizers led (both before and after the killings) normal, average, bourgeois, working class, professional or aristocratic lives.<sup>25</sup>

Part of the answer for the pedantic orderliness of the concentration camp can be understood by grasping the fact that its violence was a direct consequence of the normal science of the time. One can grasp this argument at two levels. First, by tracing the scientific debates of the time and second, through the wider notions of science especially as they appeared in the records of the Eichmann trials.

The concentration camp had its roots in the nature versus nurture debates

of the time. Eugenics was a part of the normal science of the time. In fact, as many as eight universities in America, including Harvard, Cornell, Brown and Northwestern, had established departments on the subject. The mass killings of patients in the hospital was a direct application by doctors of established eugenic and psychiatry theories.<sup>26</sup> Many of these doctors were outstanding intellectuals. Max de Crinis was a professor of psychiatry at Berlin University and a director of the psychiatric clinic of Charite, one of the more famous hospitals in Europe.<sup>27</sup> The mass killings had all the characteristics of a community psychiatry project involving a network of mental hospitals, university professors of psychiatry, directors and staff of the hospitals voluntarily working out the normal science of their scientific theory. The first concentration camps that came into being were seen as experiments in re-education. The doctor-psychiatrists who guided it looked upon it as an attempt to eliminate ‘useless eaters’—the mental patients. In 1939, there were 300 000 such useless eaters in German psychiatric hospitals; by 1946, the number had been reduced to 40 000. It was only after the basic methods of killing were worked out in these hospitals that the gas chambers were dismantled and moved to other locations. This time the ‘inferior materials’ were Jews, Gypsies and Poles.<sup>28</sup>

The concentration camp was an industrial research laboratory organized completely by doctors and scientists. In fact, histories of synthetic chemistry, which celebrate the synthesis of ammonia and indigo by the companies of the IG Farben group, fail to emphasize its complementary role in the organization of these camps which went beyond the use of Xyklon-B. It is in this context that I want to establish a parallel not often considered seriously, the parallel between a paradigmatic scientist like Winslow Taylor and an individual like Adolf Eichmann. Two points must be noted: first, that Eichmann thought of himself as a scientist–bureaucrat and, second, that the banality of Eichmann’s evil lay in his scientific attitude. Eichmann deserves to be recognized as the Winslow Taylor of the concentration camp. Let us not forget that both the originators of the assembly line and Eichmann confronted the same problem—the management and disposal of the body. The concentration camp operated on the same logic, only the materials handled were human hair, teeth, skin or fat. All one has to do is picture Werner Hyde, professor of psychiatry, lecturing before high Nazi officials on the merits of carbon monoxide.

The question of the ‘banality of evil’ in the Nazi bureaucracy has been raised by Hannah Arendt<sup>29</sup> and Bruno Bettelheim.<sup>30</sup> Bettelheim emphasizes that ‘by all scientific standards Eichmann was a “normal” person. Half a dozen psychiatrists had certified him as normal. One psychiatrist even said he was “more normal at any rate than I am after having examined him”’.<sup>31</sup> Another found that Eichmann’s ‘whole psychological outlook towards his wife, children, mother and father was not only normal but most desirable’.<sup>32</sup> With Bettelheim one can then wonder how to account for the incongruity of the murder of millions and the normalcy of the man in the dock? Bettelheim’s explanation concerns the structure of scientific and legal detachment. He notes that Eichmann lacked what might be called a fully expert knowledge, and he remarks that Eichmann had only read two books on the subject but he

considered them as embodying ‘a scientific approach to the problem’. Bettelheim adds that without this notion of scientific detachment, the inhumanity of modern totalitarianism cannot be understood.

*Hiroshima: the ultimate experiment*

The last example that I wish to discuss is the bombing of Hiroshima. The bombing of Hiroshima embodied the violence of vivisection in three phases of its career. First, in the very decision to bomb the city; second, in the attitude to the survivors of Hiroshima; and, finally, in the continuities of nuclear research itself.

Fredrick Wertheim points out that there is a persistent myth that scientists as a group were against the dropping of the bomb. He contends that the leading scientists not only helped the governments in making the decision, but also picked Hiroshima and Nagasaki as experimental sites. The cities were free of the devastation of incendiary bombs and were thus appropriate sites for the scientific evaluation of the nuclear impact. But what is more frightening is the general absence of atonement after the bomb. In fact, in *The Children of the Ashes*, Robert Jungk shows that scientists saw in it new possibilities for science.<sup>33</sup> The city became in their eyes an industrialized table of symptoms to be subjected to the clinical gaze. Jungk describes scenes at the ABCC clinic where patients were studied in a Taylorist fashion, to be ‘thumped, have light shone in their eyes, be photographed, pumped full of serum’.<sup>34</sup> None of the specialists ever explained to the patients why or with what purpose all this was done to them. If a patient asked: ‘What do you advise doctor? What can I do to get well again?’, the reply was always the same: the clinic was not a therapeutic establishment but a research institute.<sup>35</sup>

The disjunction between research and healing, implicit in vivisection, reminds one of the statement of the French physiologist, Charles Richet:

I do not believe that a single experimenter says to himself, when he gives curare to a rabbit, or cuts the spinal marrow of a frog, ‘here is an experiment that will relieve or cure the disease of some men.’ No, in truth, he does not think that. He says to himself, ‘I shall clear up an obscure point. I shall seek out a new fact.’<sup>36</sup>

The third element in the Hiroshima story is the return of the scientists, some of whom had protested against the bomb, back to the laboratories which produced the bomb. Jungk cites the case of the brilliant Hans Bethe who had condemned the bomb as anti-Christian and genocidal, and who, a few years later, became one of the enthusiastic exponents of the H-bomb. Such macabre enthusiasm can only be understood by focussing on the internal structure of science as a mode of cognition, where violence is justified in the objective pursuit of knowledge. There seem to be no internal checks to its cognitive imperatives.

I would like to end this section with a suggestion a colleague of mine once made. He remarked that vivisection anticipated Auschwitz and Auschwitz the vivisectional imperatives of the new experiments in planning and development. The objectivity of science is embodied even in the plan of the

revolution, be it that of Stalin or of Mao. They all justify the imposition of suffering on millions in the name of scientific development. One wishes that critics of science would confront this genre of violence somewhere in the timetable of their programmes.

## V. The concept of triage in modernity

Villagers Die in Bhabha City—*The Times of India*

*I sometimes wonder what is worse  
A secret or a lie  
A word unspoken or left unsaid  
When either way a man is dead.  
I still maintain,  
It is not death that is important  
But the manner of dying  
Like a child's first poem  
Wiped by a careless eraser.*

Lurking quietly within modernity as a scientific project is the idea of triage. Triage has been the silent term mediating between the ideas of vivisection and progress. Vivisection as an experiment has inherent in it the idea of indifference, and progress implies obsolescence. Triage interweaves these ideas as the obsolescence of those one is indifferent to.

With the reappearance of triage as a formal concept, modernity has come full circle. If progress demands the summoning of the 'other' into modernity, triage is the dispensing of that other. Both concepts include the idea of science as memory. Science once felt that these societies had no history; today, it seems to have decided that they have no future. If the tribal was once whipped into modernity because he was a savage, today he is being bludgeoned back as being incapable of science. The decision in both events is articulated as part of the discourse on rationality. Societies and cultures are now being destroyed because they are considered refractory to the scientific gaze. Triage is the final abandonment of modernity as a universalizing project. The Western encounter with the other ends, in its eventual logic, in erasure. Triage blends with that other great strand of modernity as rationality, the atomic holocaust. The two death warrants threaten to put an eventual stop to the world as a modern world.

Etymologically, *triage* was a French word which referred to the act of sorting. In the 18th century, the term was used to refer to the sorting of coffee beans or pelts. It acquired a certain stability in medical dictionaries as the method of screening patients to determine priority of treatment, particularly when the demand for medical treatment outran the supply of medical facilities and personnel. Richard Rubenstein, in his book on triage, cites an example of such a process. It relates to the manner in which scarce penicillin was distributed among American soldiers during World War II. Rubenstein explains:

Some of the stricken men had received their wounds in battle, others in brothels; it was decided only soldiers with venereal diseases would

be given penicillin, even if it meant that some of the wounded would die without it.<sup>37</sup>

The rationale was as follows: whereas those with broken bodies could not swiftly resume military duties even with penicillin, those with a venereal disease could be despatched to the front within a few days, and they had a prior claim to treatment. Today, the concept of triage has escaped the confines of the hospital and acquired a wider socio-political connotation. It is the history of this wider notion of social triage that we must seek to construct.

Science has no place for the defeated, except as objects of an experiment. The rudimentary notion of social triage is thus inevitably present. Triage represents a notion of obsolescence which goes beyond that involved in the free market. The obsolescence created by the market has been chronicled in the writings of political economists since Adam Smith. Social triage differs from it in that it is a deliberate decision or act of state to define a target group, such as a minority within its territory, as dispensable. The decision, however, must also be articulated on rational grounds. For, though triage is genocide, the sentence of death on those regarded as refractory to the scientific gaze must be made to appear perfectly rational. It is in this sense that the term helps us to understand the particular quality of violence of which scientific rationality is capable. Let us cite some examples.

With the impact of the Enclosure movement in England, peasants became an uprooted class. Poverty and vagrancy, which at the time often went together, were recognized as social problems. The poor as vagrants, lunatics, criminals and even as children were seen as refuse and therefore considered expendable. Children in particular were used in a large number of hazardous jobs. They were often sold to workhouses for a few guineas. What was originally left to the free play of market forces was conceived of in a grander, more centralized fashion by the utilitarian theories of Jeremy Bentham. Bentham visualized a grand scheme—never operative—whereby those classified as refuse (children, lunatics or vagrants) were placed in a total institution, subject to complete surveillance and harnessed as work units by the state.

Richard Rubenstein notes the theoretical continuity between Bentham's organization, the panopticon, and the attempts by I. G. Farben to utilize death-camp labour for the production of synthetic rubber.<sup>38</sup> Both were efforts to rationalize the use of those who were defined by the society as waste: the poor as 'refuse' in Bentham's time, and the 'useless eaters' in Hitler's Germany.<sup>39</sup> The notion of triage goes beyond the rational utilization of such categories of people to include a discourse on their death reconceptualized as a problem of disposal. The Benthamite project embodied in the poor house sought to rationalize philanthropy as a project. Triage later on was to convert aid as tutelage to aid as erasure.

There are two separate processes of sorting here. The first involves the classification and exploitation of marginals in a society. The second centres around the elimination or death of those regarded as marginalized and obsolescent.

The re-emergence of triage within the debates on development has to be constructed along two conceptual foci. The first centres around the debates

regarding the coming of the post-industrial society and the second around the resurgence of the new reductionism, as in the emergence of socio-biology as a discipline.

Krishna Kumar, in a fascinating book,<sup>40</sup> has referred to the spate of neo-Comteam schemes, mapping out the future of the industrial West. Self-styled as 'post-modern', 'post-civilizational' or 'post-industrial', these scenarios have in common the belief that modern industrial society is undergoing a structural change, where the largest part of the work force is no longer just in agriculture or industry but also in the service sector. This tertiary service sector is also differentiated into an additional quarternary sector, composed basically of scientists and other knowledge workers. Predictably, what is central to such societies is the centrality of theoretical knowledge, the primacy of theory over empiricism, the fact that theoretical formal knowledge provides the dynamic of innovation as expressed in synthetic chemistry or in the materials sciences.

What is interesting about these descriptions is their silences. There is a feeling that the Third World is irrelevant, that the new developments in electronics, solid state physics and chemistry had rendered it unnecessary. Science has generated surplus which in turn has enabled modernity to escape from its reliance on the Third World for raw material or labour. The Third World, according to Kumar, is now 'something to be cast away, once its riches have been plundered and its cultures smashed, like a child throwing away a ruined toy'. It is now conceived as an area for tourism or for the siting of some of the more polluting industries of the world.

#### *On sociobiology and triage*

This process is abetted by the legitimation provided by socio-biology in the works of Edward Wilson,<sup>41</sup> Richard Dawkins<sup>42</sup> and Garrett Hardin.<sup>43</sup> Our examination of these arguments centres around Hardin's two seminal papers: 'The Tragedy of Commons' and 'Life Boat Ethics'.<sup>44</sup> If nuclear holocaust had its macho rationalist in Herman Kahn, development as triage has his equivalent in Garrett Hardin. What we shall try to explore is not Hardin's arguments but the classificatory structure of the thought underlying them. His two papers are like parables with an Euclidean lucidity about them. Once you accept the axioms, the logic of the world they unfold follows ruthlessly. Therefore, it is the basic assumptions that we must map. Hardin's work posits (1) the contrariety between individual greed and social good, leading to the conclusion that the only solution is the Hobbesian one of coercion; and (2) the ineffectualness of morality or humanism as substitutes for hard-headed science, both in the short and in the long run, leading to the conclusion (arrived at by other socio-biologists) that altruism is pathological in the context of the problem of survival.

Hardin, it may be noted, omits to encode the contrariety between biology and culture in cosmological terms. He lacks the conception of an ecologically coded society, a vision of society that sees science as a part of the sacred or a vision of man as a fragment of the cosmos. The two papers can now be read as successive denouements of one plot.

As I have said, the formulation that Hardin offers is basically a Hobbesian one. The commons is any physical facility which is commonly owned or used. It can be an ocean, a lake, a forest or a prairie. The logic of the commons unfolds as follows: The commons can be compared to a state of nature, where every man seeks to maximize his individual gain. No problem arose initially because it was a phase of abundance. The problem begins in a situation of scarcity: as each individual pursues his own interest, as individual utilities are maximized, there is an increasing threat to the social good. The eventual result is the degradation of the commons. For Hardin, like Hobbes, an appeal to conscience is futile. Only 'mutual coercion, mutually agreed upon by the majority of people affected' will do. What is missing in Hardin's notion of the commons is the idea of *communitas*. Any reading of anthropology, except the anthropologically suspect work on the Ik, would have shown Hardin that traditional communities avoided the tragedy of the commons because the management of the commons was a matter for the total community, not a matter for the individual. It was always a matter of community ethic for group survival, which meant that it was based on 'what they contributed to the environment—what they gave, and not what they took'.<sup>45</sup>

Hardin's study of rationality and the commons also lacks a concept of *communitas* as a sense of the sacred. Rationality, to Hardin, borders on disenchantment, an absence of the sacred. He attempts to see the individualism of the group as being restrained by society. In Hardin's scenario, individual biology confronts the social group. The grammar of a wider cosmic view is totally missing. The idea that societies have to be seen as webs of a wider relationship between man, nature and God is alien to Hardin. He describes the earlier period of the commons in a manner that would leave any tribal aghast:

A hundred and fifty years ago a plainsman could kill an American bison, cut only the tongue for dinner and discard the rest of the animal. He was not in any important sense being wasteful. Today with only a few thousand bison left, we would be appalled at such behaviour.<sup>46</sup>

The real tragedy of the commons is captured more poignantly in this one sentence than in the rest of the essay. It shows that Hardin's Hobbesian rationalist science, embodied in planning, has no conception of the sacred. As a result, ecology becomes a managerial science, mopping up the ecological degradation after industrialization has done the damage, rather than a cosmic view of the world. Affinity to nature is seen more as humanistic poetry than as an axiom for science.

The pity lies in the fact that many of his critics internalize the same structure of thought. They seek to inject humanism or morality into this view of science to 'contain' it, while leaving science itself as a world-view intact. The tragedy of the commons is, in fact, the tragedy of rationality and science, of a world-view which has so lost its sense of the sacred that it fails to see that science—rationalist, hegemonic, value-neutral, schizophrenic—has become the major anti-ecological force today. Like the scientist's own invention, the Maxwell's Demon, science today stands as the major cognitive gatekeeper

preventing a return to a more sacred and genuinely ecological vision of the world.

This brings us to the second essay of Hardin, 'Life Boat Ethics'. The leviathan that was once a commons has become a constricted life-boat. Each rich nation can be seen as a life-boat full of comparatively rich people. In the ocean outside flounder the poor of the world, wanting to get in. What should the life-boat passengers do?<sup>47</sup> The questions are simple: Is aid necessary to these starving people? Should America aid the people of Ethiopia? Is altruism rational?

The background to these issues was the controversial work of the Paddock brothers, *Famine—1975*.<sup>48</sup> The Paddocks argued that since America accounted for more than half the cereal grain in international trade, it had to decide whom it must save. They recommended a system of triage, where the most hopeless nations were to be left without food. Hardin agrees with them and goes even further in criticizing the establishment of a World Food Bank to rescue starving nations because, for Hardin, the poor are irrational, superfluous, and multiplying much faster than the rich. He argues that a world food bank is a commons in disguise, and that it would only enable the less provident and less able to multiply at the expense of the abler, more provident, bringing eventual ruin on all those who share the commons.<sup>49</sup>

Hardin finds individual altruism even more pathological. For Hardin altruism can only exist on a small scale, over the short run. Other socio-biologists add that altruism and universal love are concepts which do not make any evolutionary sense. Consider Hardin's account of Mother Teresa:

It is commonly estimated that a fourth of a million of India's poorest sleep on the streets of Calcutta. Many of them die every night and are removed by municipal drays. Many others, near death, have trouble moving the next morning. Some of these are picked up by Mother Teresa's workers and carried away to a rest home where they are bathed, put in clean apparel and fed. The idea is to give them a dignified death. . . . What then? The bed of the survivor is needed for a new candidate for death (for which Calcutta's nocturnal sidewalks and alcoves furnish a more than bountiful supply). So the recovered Indian is put on the sidewalks—'to try again' as it were. Sooner or later he will fulfill the implied contract. . . . The question we cannot refrain from asking, does Mother Teresa increase or decrease the amount of suffering in the world?<sup>50</sup>

I think the answer has to be that Hardin cannot be the analyst; for he himself is the case study. His cost-benefit analysis will not do. The crucial issue is not the dualism between compassion and science; between the prisoner's dilemma and zero-sum versions of triage. The crucial issue is that science has failed to guarantee life or understand its meaning. It has given the poor of the Third World only the language of socio-biology. If life is eventually a hopeful wager, then our hope lies in confronting the fact that the Gandhis and the Mother Teresas are the real scientists, and are not merely



sentimentalists. The intuitive compassion of the nun, like the intuitive responses of the tribal to nature, is more life-giving and ecologically sound than all the science and modernism of the Hardins and the Paddocks of the world.

## VI. On development as a scientific project

Underlying the notion of the modern state and the notion of science is a monolithic world-view. The nation-state cannot permit ethnicities which serve as competing sites for power; and modern science cannot grant the legitimacy of folk or ethnic knowledge. Both kinds of ethnicity violate the modern conception of order. The Hobbesian project which encapsulates modernity as a creation myth was literally a contract between the state and science to manufacture the idea of a mass society of equal and uniform individuals. Modern society was monocultural in more ways than one.

The tragedy of modernization in the Third World was, however, doubly violent. It sprang not only from the violence of the West through colonialism and science but from the modernist impulse of our élites, internalized without a clue to its genealogy and its self-doubts. Independence thus was literally a celebration of science. If it was 'a tryst with destiny', as Nehru called it, then destiny as the future 'belonged to those who made friends with science'. There was an Euclidean clarity about this commitment and a touch of innocence about the faith in the power of rationalist science and its technocratic projects. Huge networks of dams, laboratories, railways and hospitals became Rorschachs of statist goals and scientific endeavours. For Nasser and his followers, Egypt, after the Aswan Dam, 'would be a paradise'; Nkrumah believed that, with the construction of the Volta Dam, 'Ghanaians would cease being hewers of wood and drawers of water for the West'. Today, one realizes the irony of such innocence. Science has failed to deliver. Yet, science continues to be the pursuit of the state, the energy for the perpetual machine of statist endeavours. Scientific projects, as Big Science, have become an integral part of the Big Government model of today.<sup>51</sup>

There is a deeper issue here. Science is not just a sacred cow; it is a fat one, and the élites know that it provides legitimacy to their greed. The parasitism of the élite feeding on technological projects, growing fat on bribery, fixing and contracts is appalling. The symbiosis between state and science has several elements within it. We shall elaborate this with examples from irrigation projects. The statist involvement in irrigation is theoretically crucial. Hydropolitics, as Wittfogel has pointed out, is paradigmatic of the relation between the state and science.<sup>52</sup> The critique of hydropolitics becomes a critique of the modern state as a technological project. We shall take as our text, Edward Goldsmith and Nicholas Hildyard's *The Social and Environmental Impact of Large Dams*,<sup>53</sup> supplementing it with examples from nuclear energy.

Underlying modernization is a substratum of intolerance. The variegated traditions of the Third World—the nomad, the tribal, the pastoral and the peasant—have to be bulldozed into a flatland called modernity, with little time given for consultation. A Sudanese politician summed it up well when he

remarked, 'If we have to drive our people to paradise with sticks, we will do so for their good and the good of those who come after us.'<sup>54</sup> So convinced is the élite in its belief in progress that an authoritarian tilt comes to it naturally. Not all cultures, however, are as ruthlessly clear as Russia, where the KGB is responsible for water projects, since such projects involve resettlement;<sup>55</sup> but everywhere most development projects are presented as a *fait accompli* to the people:

At one end of the scale, people receive scarcely a warning that waters will arise. Others may be notified but neither compensated nor assisted to move. . . . Lengthy police intervention, military coercion and the bulldozer sanction, which is used in places, is acclaimed to be successful if bloodshed can be avoided.<sup>56</sup>

To the laboratory state, these people are not scientists, but ethnics practising styles of life—agriculture, medicine, crafts—which are refractory to science. According to the logic of development, they must either acculturate or disappear for the laboratory state must break the rituals of tribalism and traditional farming.

In the process, 'peaceful' development has created more refugees than have bloody wars. The list is awesome. Ghana's Volta Dam saw the evacuation of 78 000 people from 700 towns and villages; lake Kingi in Nigeria displaced 42 000; the Aswan Dam 120 000; the Kariba Dam 20 000; Turkey's Keban Dam, 30 000. The Panon Dam in Vietnam will uproot 500 000 people, and the Three Gorges Dam in China, an estimated 2 000 000 people. In the Philippines, 40 new dams will displace 1.5 million people.<sup>57</sup> Nearer home, the dams in the Bastar area will inundate 170 000 hectares of land. It is the scientific mandate that justifies the violence of such displacement.

Even the word displacement is used wrongly here. The linguistic connotation is of hydraulics, of mass being moved indifferently across space. To a politician (and the technocrat) the idea that flooding a plot of land might destroy a culture is incomprehensible. They fail to realize that to a traditional people land is not real estate or a space over which people are moved like objects. Land is memory, a map of one's world, a way of life for which people are willing to die.

What we are in fact confronting here is development as slow genocide. The irony of the tribal-peasant turning into a refugee becomes even more poignant in today's India. At one end, the tribal-peasant and the peasant, who are natives, are defined as squatters on their own ancestral land and confined to refugee camps called parks. At the other end, the laboratory state invites non-resident Indians, particularly scientists and engineers, to set up new industries. It is establishing technology parks and science cities for them. Today, to be scientific is to be. The tribal as a native is a refugee while the non-resident Indian as a scientist is defined as more than a citizen.

Intrinsic to all such technocratic projects is the idea of Haussmannism. It can be defined as an act whereby a mechanical scheme—a plan for a city, a factory or a dam—is imposed on a culture without any consideration for the traditions of the community. The term derives from the activities of the French planner, Baron Haussmann, who imposed a mechanical grid of roads

on Paris after the Commune. Haussmannism is the leviathan imposing the flatland of mechanical order on the varieties of tradition or nature. The resettlement activities of technocrats, such as Jagmohan, during the brief Emergency era in India could be cited as another example.

To the Haussmannism of the dam as project, we should add its Haffkinism. Large dams literally become experiments on the people. So does the new technology of nuclear plants. Robert Jungk has observed in *The Atom Staat* that many reactors have been built without full knowledge of their behaviour and located on sites close to large cities.<sup>58</sup> The technology of most large dams is basically vivisectional. With limited simulation, they are imposed on the people. Goldsmith and Hildyard note that ‘many dams fail as a result of what Widstrand calls “the pilot plant syndrome”’.<sup>59</sup> The contractors and the engineers assume that the technology used to build small dams can be used, with little or no modification, for putting up large dams. Indeed, as Philip Williams points out, ‘The new technology of large dams is only imperfectly understood and largely relies on the extrapolation from the design of smaller dams.’<sup>60</sup>

Similar problems of ‘scaling up’ have been encountered in the nuclear industry. Williams regards the technology of large dams as being, in many ways, comparable to that of nuclear power plants. ‘Both require massive capital expenditures; both are new technologies with limited operating experience; and, for both, the consequences of catastrophic failure are large-scale devastation. Although the hazards associated with nuclear power are now generally accepted (though this has rarely been allowed to interfere with governmental nuclear policies), the hazards associated with the building of large dams still tend to be ignored (and this despite our knowledge that the failure of a large dam could cause the loss of hundreds of thousands of lives and billions of dollars worth of damage).’<sup>61</sup>

For the native in the refugee camp, death is a slow process. Only for the old is the moment of disruption also the moment of death because few can make the transition to the new regime. For the living, the imagination of catastrophe acquires a new dimension. As the authors remark,

There is scarcely a scheme in existence which has avoided the twin problems of cultural disruption and social alienation. People moved from their homes are typically passive, dispirited and lacking in initiative. No amount of government aid can compensate for loss of land handed down through generations.<sup>62</sup>

The mind-set of market or of science is a poor lens with which to perceive the sustaining relationship between people and their land. For the market, compensation terminates the contract; for the scientist–technocrat, the development of all land is inevitable. Neither market nor science can capture the symbolic universe of the peasant–tribal. When Guyana’s Akawaio Indians were asked ‘to contribute to development’ by vacating their land, their headmen wrote the following letter to Prime Minister, Forbes Burnham

This land is where we belong—it is God’s gift to us and has made us as we are. This land is where we are at home; we know its way; and the things that happen here are known and remembered, so that the

stories the old people told are still alive here. . . . This land is the place where we know where to find all that it provides for us—food for hunting and fishing, and farms, building and tools, materials, medicines. Also the spirits around us know us and are friendly and helpful. . . . If we had to move, we would be lost to those who remain in other villages. This would be a sadness to us all, like the sadness of death.<sup>63</sup>

What was an appeal is today an obituary; for the obsolescence encoded in progress has no place for the sacredness of memory.

The movement from cultural destruction through obsolescence to triage as erasure is a short step. The most moving case is the systematic elimination of the Ache Indians in Paraguay, in the so-called forest clearance programmes. Behind it is the plan for building one of the world's largest hydro-electric power plants. To the giant corporations and its agents, the Ache Indians were inconvenient; so the Indians were hunted down and the forest cleared. Richard Arens, in his *Genocide in Paraguay*, describes it thus:

Men, women and children are being indiscriminately mowed down in such hunts. The preferred weapon of the massacre was the machete which saved the expense of bullets. Those willing to accept unadulterated slavery might also be kept alive at a subsistence level and without medical attention. The majority of those left in the reservation succumbed to despair and disease. The use of their language was discouraged, their traditional music prohibited. . . . About one half of a recently captured band (of Ache's on a reservation) was liquidated by the *conscious withholding of food and medicine*.<sup>64</sup>

The elimination of the Ache Indians has raised in a fundamental way the problem of genocide through development. The process of resettlement, involving slow death through deculturation, falls within the clauses of the Genocide Convention. Item three of the Genocide Convention of the UN includes 'deliberately inflicting on the group conditions of life calculated to bring about its physical destruction in whole or in part'.<sup>65</sup> It is precisely this kind of realization that has triggered the protest movement against the proliferation of dams in recent years.

The recognition that development could be ethnocidal is present in the massive morcha at Gadchiroli, against the Ichampalli and Bhopalapatnam projects, under the leadership of Baba Amte and Lal Shamsah Maharaj. Amte drew attention to the fact that at least 40 000 tribals would be uprooted along with millions of trees. No doubt the state intended to transplant these people elsewhere with the help of some monetary compensation; but nothing can compensate the wrench they would suffer in leaving their traditional cultural environment for an alien setting. To remove tribal people from their natural habitat would be cultural ethnocide. Amte's appeal to the prime minister received the usual bland reply. But the logic of such development was clear, at least to the tribals and to some other sensitive Indians. For instance, Sunderlal Bahuguna realized that they were confronting a local variant of a world-wide phenomena. He reminded the morcha that tropical

forests were dwindling throughout the world, that the rapid pace of industrialization had posed a threat to the very survival of humanity in some areas. The movements against the genocide of the Ache, the morcha against the Ichampalli dams—all confront the problem of obsolescence as a consequence of expanding development and limited resources. They all confront the fact that the laboratory state now deems certain cultures dispensable.

The notion of calculated dispensability, of erasing people from the commons of the world, has several dimensions. In triage, the present generation can be treated as dispensable. An outstanding example of this was Stalin's planocentric vision, where a whole generation could be sacrificed for a better future. The current experiments in nuclear energy, especially the storage of nuclear wastes, literally condemns future generations. It is estimated that nuclear wastes, unlike other bio-degradable materials, may remain active for 50 000 years.

The transfer of pollution-prone industries to the Third World is yet another example of the same vision. (Recently, China has agreed to store nuclear wastes from Germany in the Gobi desert in return for foreign exchange!) Again, while Europe is no longer used as a site for nuclear testing, the space of the Third World is regarded as appropriate for the purpose, for the simple reason that it is considered dispensable. John Doom, the Tahitian delegate to the World Council of Churches Meeting on Nuclear War, remarked:

The Pacific, the forgotten third world, is well known as being a very big ocean. We are more than five million native islanders who live in the ocean. We say that the Pacific is our continent. Your continent is Europe or the States. The Pacific belongs to us. We think from sea to land not from land to sea, because the sea is our life. . . . I would like to ask a question. We want to ask the Europeans why do you come here to do your testing? Why?<sup>66</sup>

Nearer home, Praful Bidwai has shown how policies of triage have been employed against seasonal workers repairing leaks at the Bhabha Atomic Research Centre near Bombay.

What we are witnessing today is a civil rights movement against development-as-terrorism, based on the recognition that the modern state committed to science has become the prime anti-ecological force in the world. What development projects like dams, or nuclear reactors, or legislations about forest lands reveal is the necessity of new concepts of civil rights. We need new concepts which grant rights to the future generation. Recently, it has been suggested that we recognize rights in natural objects like trees, forests, rivers and seas. But contractual or legal systems cannot serve as the basis for ecology. One needs a return to the sacred, where a community recognizes its moral responsibility for its environment. The Chipko movement is a superb example of such consciousness. The recent raids by peasants on forest nurseries in Karnataka, where they uprooted thousands of eucalyptus seedlings, represent another example of such a will to ecology.

It inaugurates one of the finest challenges to the scientific regime. It pinpoints that rational-bureaucratic science is a repressive regime. It shows

that tribal cultures and peasant agriculturalists are often more ecologically sound than the modern scientist. One is slowly realizing the deep wisdom of swidden farming. Ecologists have admitted that it is the right way to cultivate a tropical forest. We are forced to confront the fact that green-revolution reductionism is no substitute for ecologically sensitive traditional practices. This insurrection of the local knowledges which demands a return to the sacred heralds the challenge to the laboratory state of modernity.

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