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Editorial

Health movement and Journalism

It has been noticed that the measuring rod for any of our discussions now-a-days is the 'modern-urban way of life'. Incidentally it should be said that, our present social life is becoming more and more complicated, even more complicated than what we may think of. Different countries, races and people of the present world have come much closer due to a rise in mutual communication. At the present hour, the aim of all the people of this world is to lead the modern-urban life. There are innumerable warp and woofs between two races, societies and individuals to reach this goal. Because there are inequality, exploitation, torcher and injustice in every society of this world. As for example an evident yet latent conflict between the rich and developed countries and the poor and underdeveloped countries, among different big and small countries within the race, and even between the men and women in the family, is constantly agitating us. Likewise the philosophers have explained this omnipresent and the human society in various ways in order to realize them and some of them have tried for their change in different ways. But it is becoming evident that even in this 21st century, no universally-accepted measure or ethics regarding preservation of the species has been built up.

Every nation and race has its own socio-economical, cultural and geographical history and characteristics. As for example our huge country has a variety of traditions and prejudices spanning thousands of years. In modern Economics, issues of public interest such as health, education etc. are considered as investments on human resources, i.e. it is so assumed that the more healthy and educated the people of a country are, the more developed the country is. In this perspective we may discuss the issue of health movement and journalism in our country.

There was nothing called 'public health' in this country before the arrival of the British. The population of the country as well as our average longevity were much less. Ayurveda, Siddha and Unani were generally used for the treatment of diseases. There were innumerable local or regional or indigenous methods of treatment besides that. It may be inferred that, public health and treatment of diseases - the application of the modern method of treatment in both of these cases started under the supervision of the British after their arrival. Naturally this system was initially fixed in the hands of the Military Forces. Later on the civilian or the one and all population of the country started getting the advantages of it. Citing examples it can be said that in 1787 the vaccine for small pox was first used in London, seven years later this vaccine was given in Kolkata. Besides that Calcutta Medical School was built in the year 1830. Gradually afterwards the so-called Allopathic (Western Medicine) treatment spreaded and became predominant all over the country. In this very perspective our indigenous treatment started retreating and is still gradually continuing to do so. But in the post-independence period the average lifespan of the countrymen started increasing mainly due to the land reforms, agricultural development, application of antibiotic medicines and a gradual development in the over-all standard of living. As a result the population continued to grow competing with that. The pressure caused by the growth of population renders all the plans of our century

friutless before one can make any kind of new economic plan.

But as the days are passing we are being able to understand that the Western method of treatment is very expensive. So we had enough doubt and scepticism about the extent to which this method of treatment could be used for the countrymen in a poor country like ours. However we are moving forward along that very path within various warp and woofs. Today this thing is undebatably true that the people of the cross-sections of our country are gradually becoming dependant on the Western method of treatment to a far greater extent and at present we are not being able to think of anything other than this arrangement. Likewise a lot of development has ocured also in the affair of public health in this country, because our awareness regarding this issue has grown largely. Two incidents in this connection are worth mentioning. During the post-independence period we attained unbelievable success in the prevention of malaria at a very little expense under the National Malaria Eradication Programme of our country. Later on during the 60's and 70's we had attained an all-round success in the Smallpox Eradication Programme. The Polio Eradication Programme are also going on now in this way. One has to remember that in any public health programme in the underdeveloped countries of the world, WHO takes the guiding role and whatever success we have acheived has been attained under its direct supervision. The key to success of the public health programmes lies with primary education. Illiteracy (specially of females), bad education and different types of backward thinking create severe handicap in the fields of our work and success.

Our health system has two parts and they are indissolubly linked. These parts are preventive aspect and curative aspect. By prevention of diseases we understand the measure for prevention of spreading different contagious diseases in a definite way before a large part of a group of people falling sick and die. This measure becomes very much helpful if applied properly. But in order to prevent diseases general socio-economic and cultural development is very important, which becomes almost a rare endeavour in a backward society like ours. Therefore we see that, in spite of collectively adopting a prevention programme we repeatedly fail to apply it excellently. On the other hand cure of the disease is to lessen the suffering of the patient by making arrangements for the appropriate and quick intervention of curative measures of the individual's disease. It is needless to say that the more our socio-economical and cultural condition would improve and alongwith the actualisation of the individuals, the more the demand for the cure of diseases would increase. Alongwith that in our health movement we have to remember these words time and again that, we are extremely dependant in the matter of individual's curative and quality health. And alongwith that, different unprecedented problems caused by the partition such as unemployment, illiteracy (especially among the women), poverty etc. have been added to this Bengal. Therefore we would not be able to bring an overnight change in the present health system in spite of wishing to alleviate its various problems.

Curative Health is gradually becoming an extremely profitable commodity in our society. Consequently a variety of arrangements for investigation, treatment and rehabilitation are shooting out all around like toad-stools. It is a very difficult job to make a check and balance of them. On the other hand if we notice, it will be evident that our mass-media is perhaps continually publishing advertisements on very unhealthy, vague and artificial issues. On inviting discussion they may easily say that it is not their responsibility to judge the justness or

rightness of these issues. There is the administration or judiciary in the society for that purpose. But we know from our everyday experience how far weak is the administration of this country, which we in the words of sociologist Myrdal may call a 'soft state'. Therefore although we wish, we would not be able to build up a perfect health system quickly.

The physicians have the right to professionally lead in the matter of health movement. It may be inferred that they would keep on cautioning and making aware the public in one hand and the state in the other hand about the country's hygiene and sanitation by continually barking to the physician-technocrats or the policy-makers of the country. But under this consideration it could be said that every kind of physician-society of our country has failed. In our country or in this state an example, where a specialist-physician alongwith a few other colleague-physicians or juniors has developed a health movement, is rare. The role of the senior physicians is quite poor in as many movements which have been made in the issues concerning health in this country. In comparison with that there are some specialities in the field of the health movement of this state. During the post-independence perod a specialist physician was the Chief Minister of this state. But it is an extremely regretful matter that he had not put any emphasis in the matter of building up an excellent public health movement in this state. Rather it can be said that he might have taken the role of a pioneer in the matter of constructing an ideal society of the physicians in this state; but we have seen that the health system of this state had been successively deteriorating since his days itself due to various complicated and almost unsolvable reasons.

Although the responsibility of taking any decision about health lies on the state government; but we should know that there is no specific declared health-policy in our country. The decisions regarding various health-related programmes (including public-private enterprises) are taken through passing different bills locally or in the Assembly and Parliament at different times. That's why so much difference has been created regarding the health system in different states of the country and they are materialized to different lengths. An excellent example of this is various mismanagements regarding the standarization of Indian System of Medicine and the so-called 'Alternative System of Medicine'. We know that various System of Medicines or Therapy's are still existing in our country for various historical reasons and it is not possible for any social system to make a check and balance of them. Moreover many of the innumerable pharmaceutical companies run their business by creating an unhealthy nexus with the physicians and quacks (village doctors) in different ways. So the situation becomes more complicated and unsolvable. In recent times the 'Consumer Protection Law' has added another new dimesion to this issue.

We know that journalism is a profession and it is mainly associated with the works of Sociology. News from various journals and magazines increase our public awareness. Health is chiefly a subject of science. And it is needless to say that science-oriented journalism plays an important role in raising the science-awareness among the people of the country. Therefore we think that health-related journalism would raise appropriate mass-awareness. In this country mass-awareness among the people is very sub-standard as a result of illiteracy and poverty. On the other hand education and culture create a stream of logic and reasoning inside our mind. So we may assume that the stream of logic and reasoning has not been contrused that much inside the common man of our country. Consequently their mind is far more suggestive. That is their psyche is comparatively smaller and it is possible to put a deep imprint on that

mind with very little, trivial or insignificant excitement. In this case the importance of newspapers, journalism and other mass-media is immense.

The massmedia of the present day is very powerful. Numerous newspapers and magazines in different languages are daily published in our country besides different channels in the television and the people from different classes of the society read them and form their opinion about different issues. Consequently public-awareness and science-awareness can flourish inside people in a much better way if the news or opinion presented in these newspapers, magazines or television happen to be close to exact truth. But one should know that these mediums have various limitations. We may arrange the reasons of this in the following form.

1. We can consider any medium to be a professional and profitable business organization if they don't happen to be the preface of any declared group or organization. Undoubtedly the mediums of numerous tiny groups are regularly getting manifested in our society; but their ability in the matter of exerting complete influence on the human society is very little. So it is better not to bring them in the discussion. But the established mediums in the society follow certain rules of their own and in the matter of disclosing any news or any opinion about that news in their medium, the rules of their organization get much more importance or priority than the importance of the news, mass-awareness, sense of social responsibility etc.. As a result the importance of the genuine news becomes secondary.
2. In order to make the mediums attractive their organizers generally present various sensational news or opinion, the truth or authenticity of which perhaps takes an extremely distorted form. It troubles especially when different types of violent incidents, incidents related to sexual behaviour, negative news related to greed and corruption occurring in the society exert their influence as news. The problem is that the impact of these national news on the common man or on the young ones with an immature mind is so far and deep-reaching that it can not be expressed in words. It has been especially noticed that they create a grave negative attitude about people, life, values and social system.
3. Although science-oriented journalism has not flourished that well in our society, consequently its cultivation and standard in the journalism of our country is not good. That's why science-oriented news are presented in the mediums with too little importance. Public health or health awareness is a science subject, although social science, economics, indigenous culture are intimately attached to it. Besides that the standard of journalism also doesn't become that good because of the educational and cultural standard of the mass not being proportionately developed.
4. Even if a journalist works very hard on the above matters he is not aptly rewarded. Consequently no such enthusiasm, except for doing a little work conventionally or insincerely in this regard, develops in the mind of the workers.
5. We don't have any arrangement for regularly receiving data, the health-related activities which take place within the administrative machinery. Instead different types prohibitive rules are forced on these issues. Consequently many misconceptions in this regard grow in the mind of the common man. **P A S**

An Introduction to Correctional Psychiatry

(Continued article - first part)

Basudev Mukherjee

[Author, a psychiatrist of Pavlov Institute, Kolkata attached to Alipore Central Correctional Home, Kolkata for the last twenty years. In this article he discusses overall quality of life (with DALY), physical and mental health and causes of death of the prisoner of West Bengal in reference to Correctional Psychiatry. Specially his objective is to inject the problems of Correctional Psychiatry into the vein of General Psychiatry. In this article the words 'Jail', 'Prison', 'Correctional Home' are used interchangeably.]

"Crime must not be punished in the individual, but the anti-social source of crime must be destroyed, and each man must be given social scope for the vital manifestation of his being."
- Karl Marx.

Introduction

In our current terminology *lockup* is a police cell used to detain an arrested individual pending arraignment. So it is the initial phase of the criminal justice process. Whereas *jails* are correctional facilities that confine individuals involved in the criminal justice system who are awaiting trial or serving short sentences for misdemeanors. In this sense our district or subdivisional judicial custody set up is jail. But the *prison* is an individual facility operated under the auspices of a state for the confinement of adults convicted of a felony whose sentences generally exceed one year. This system is similar with the Central Correctional Homes of our state. But the difference is that there the large number of population, almost 85%, are undertrial.

Conventional health indicators have tended to focus on mortality, in large part because mortality data have been widely available. Thus most international and national assessments of leading health problems have been based on counts of the number killed or on summary indices of mortality, such as life expectancy or the infant mortality rate. Whereas to capture the impact of both premature mortality and nonfatal health outcomes, a single common currency is required. The disability adjusted life years (DALY) provides such a common currency by measuring impact in terms of number of years of life either lost due to premature death or lived with disability, weighted by the severity of the disability. This time dimension is the only way that premature death can be compared with morbidity and disability.

Preface

Prison, strikes as horrible and terrifying in the mind of people in general long since. Gazing at its high boundary wall with open eyes, we just imagine various things regarding the series of events happening inside it. As we guess, those dangerous persons are kept within this, for whom it is highly dangerous to be set apart outside. Yet some of them perhaps normally associated with us outside a few days before. He was not supposed to be so much dangerous

at that time. Probably he is a suspected person at present, therefore he is a prisoner in-custody, in the philology of jail. And if convicted by verdict, then he will be a convict.

Any incident relating to jail possess considerable importance in the mass-media. On account of this, on the one hand eagerness being shaped in the mind of people in general relating to this matter and events of short in nature is being propagated loudly with different colours to fulfil their eagerness, on the other hand (such as the hang of Dhananjoy caused to happen for some time past). But continuing for a long time we have a generic impression relating to prisons and that is not fair. Certainly this 'label' is being changed also in course of time. It is being observed that a mixed reaction or perception of panic, antipathy, sympathy, compassion etc. is divulging in the mind of human being regarding jails. Probably which is assuming a distinctive figure in particular incidents.

Nowadays prisons drawn the attention of the middle-class. One of the reason appears that, persons of this category even are being involved in criminal activities. Apart from this, several middle-class people are dwelling in the prisons with charges of torture and murder of their wives. Formerly persons from the underprivileged backward lower socio-economic class only used to be prosecuted for criminal activities and turned up in prisons. And the people of middle-class or aristocrats happened to see in prisons motivated by political and rebellious activities. But in modern times, teenagers and adolescent young men and women from the middle-class family also existing in the gang of general offenders. In effect, conservative petty-bourgeoises have to move about just.

In past few years, death in prisons has drawn the attention of mass copiously. Diligence of the National and State Human Rights Commission and various Human Rights organisations exerted considerable influence in this matter. It is a fact, the prisons are one of the important segment of our society and there is no cause to remain any doubt regarding its antiquity and cultural heritage. It is most natural that people in all strata of our society will be intently craving about this, specially the cultured, conscious one. Of course this eagerness is much administered by the organic impulse, with the appetizing news of media, not so much cerebral.

However, in the ratio of population, the criminal activities befalls in the other Western Countries specially in U.S.A., the figure is considerably lesser yet in our country. Research on our prisons have not been able to produce such demand among the educated class yet, from the viewpoint of sociology.

Though we are aware that if an all-round improvement of a society is to be originated, elevation of its prisons is a must. Probably in this instance the angle of vision of our intelligentsia is merely of this sort that the prison affairs are exclusively a matter of preservation for human rights. So whoever contemplates this subject, they will consider these alone, others should no longer be anxious for this. It should be observed that in the Western societies even, a lot of research work on prisons are being performed, whom we imitate blindly in respect of culture. And the people who have been fortunate to have visited prisons of various countries in the world, their opinion is prisons all over the world, are all the same.

Because these *Homo sapiens* are present in all societies. They steal being greedy or being goaded by need. That either due to psychiatric abnormalities or being enraged to each other, they behave maliciously or tend to commit murder. Further, being poverty-stricken or for more attainment of personal object they befall in to various criminal activities. In perspective of international law and order, all these are social crime. More surprisingly, even now that very

law of ancient 'Rome' is still in force more or less in modified form, in all societies, in all countries worldwide.

So it may be guessed, perhaps human being simply became modern externally, not inwardly in that manner. Otherwise how the ancient laws of several thousands years are being applied in this twenty-first century? However, certainly there are somewhat quantitative and qualitative disparities within the prisons all over the world. In comparison with the prisons of our country, how far can it be matched? Most foreigners' conception is, compared to the tropical countries, the prisons in cold countries are too much inferior, specially the prisons in Europe. Because of the humid weather of that place, once someone affected by tuberculosis, chance of being eradicated from it, is remote. Reckless efforts to be exercised there to keep the damp rooms of the prisons warm. Lives of the prisoners there turns unendurable due to the unceasing fungal infection.

In comparison, the prisons in tropical countries are salutary by far. Because radiance of the sun here, even though troublesome, is powerful enough to annihilate the germs. The prisoners here may keep themselves much more healthy, in vile with the scorching rays of the sun. In that case, what are the problems of the prisons here? First of all, it should be mentioned that negation of work procedure of the captives is the major problem of our prisons. 87% of them are in-custody or under-trial, in the different prisons of India. 90% of these prisoners have been stuffed in, on suspicion of trifling criminal activities. A lot of such confined would be found in prisons, who are languishing for several years without trial, nobody makes enquiries for them. Probably they have no family circle, even though exists, they are not aware of the fact where to submit a petition to release their person.

Prison devoid of work

Besides, if considered otherwise a little, it may be speculated what a vast amount is being incurred as expenses from the Govt. treasury to provide daily diet, water-supply, health and sanitation, electricity, amusements and different innumerable services to these countless captives. Although 90% of the inmates of our prisons are indigent person, but in that case even, this cannot be an alternative for any welfare-approached work schedule.

In addition to this, two glowing riddles appears in this matter. In one direction, an inmate is being nearly disabled physically and mentally as he is confined joblessly, on the other direction, very likely it is possible to provide permanent employment for much people or to build somewhat immovable properties with the amount spent for them by the Govt., if allotted for development works. In this instant, that property is being wasted. Besides, as huge amount of money is being spent through a Govt. management, the means for sprouting of corruption with branches and twigs are being devised in that system. No immediate sign is indicated for a solution of this condition, to begin with.

Because the inmates stays here by the order of courts. So they cannot be released from prisons, unless the courts pass orders. Still we realize that surrounding these inmates, crores of cases are pending in different courts of India for a long time and no possibility of speedy execution is there. So we have to apprehend that these sort of circumstances or disorders will be continued for a large time more. Since different self-interest of a large number of people are wrapped around it.

One more object deserves attention here. The conflicting issue of the prisons is to encoun-

ter for the welfare of the inmates along with preservation of general security. Those who are attached with this system, need to consider the matter uninterruptedly. As in the manner it should be kept in mind that these inmates are also human beings, so the minimum satisfying needs of a man for healthy living should be supplied to them entirely. Further, risk factors may fall short to security in diverse ways to perform it. Since there is no termination of beneficent works for human being, specially if we desire to rectify any person. In fact, those who are exceedingly trickish or competent among these inmates, certainly they will try to escape by deceiving this system. This panic always strikes in the mind of employees of this organization. So the administration, requires to be on the alert for 'jail escape'. Like a vigilant watchman along with various beneficial activities. Naturally our security arrangements are not so much steady, in effect possibility of unexpected incidents on several occasions remains abruptly. Influence of it befalls on the other inmates subsequently and the entire correctional procedure become startled and halts.

Another fix dilemma of our prisons is to undergo a long-drawn confinement of some convict. Long-drawn, means to say undergoing the term for more than twenty years, many of such captives would be found here. Heard that excellent arrangements are there in this matter, in the states of southern part of this country. Prisoners there avails the opportunity to ingress and adapt themselves with mainstream of the society through various provisions gradually (parole, open-air jail) after serving a period of seven to ten years. Their methods are surprising even, to supervise this action closely. Even now, we haven't been able to develop any system similar to that still.

Nature of crime

One more matter to be mentioned here, no classification of prisoners in accordance with the offence is done in the prisons of the state. As a result, the general and high-risk prisoners find an opportunity to associate unitedly. Therefore it is nothing unusual to come about any type of long lasting infectious influence in the mind of general prisoners. Besides, various inconveniences matures in cases of disease and uneasiness. Those prisoners, who frequents unremittingly, they transmits various infectious diseases in the prisons, such as pulmonary tuberculosis, malaria, AIDS etc.. In several states of this country and abroad, there are provisions to keep the undertrial and convict prisoners separately.

In this connection, it may be mentioned that, there are no professional criminal or murderer in our country, so to speak. If someone proclaimed as a professional criminal, even by no means they are competent substitute to be compared with the Western professional criminals. Commonly it appears that an inaccessible, complicated inter-connection exists on the whole amid the administration, political party organizations, mafia-industrialists etc. for those criminal activities occurs in larger society. To consider honest-dishonest, noble-evil, great-ordinary and so on, is nonsensical here. Because everywhere in the world, for attainment of objects of this sort, it is found to be formed opportunist but impolitic factions (expediency or compromise and barter, in the style of Edmond Burk) to direct the state or administration.

From this, conception grows in this manner that, the matter of occurrence of crime is inextricably linked with the principles of economics and social power, ever so advanced may be the social 'culture'. In addition to that, till our society is too much tolerant in these affairs, since a person here is entrusted for reformation on several occasions. But any person, if

incorporates with a poisonous circle or falls into incivil practices of livelihood, can not be liberated from that because of various reasons. At that time crime turns into a craze and profession to him.

However, our topic to be discussed here, how far these organizations and methods, having a name 'prison' being able to produce good effect completely with dexterity. Since there is no such society in the world where crime does not occurs and chances of occurrence are rather more there, where division or inequality is as much among human being and the societies those are as far as opulent. More to be kept in mind that, the mental reflexion of a criminal to protest against the improper and injustice is revealed completely in committing a crime. In such findings, alienation between the social revolutionaries and criminals are central in a region. Where criminals commit an offence for personal sense-enjoyment and the revolutionaries desire to hoax the law and order system of the society predominating the universal interest.

The number of captives in the prisons of West Bengal has grown almost threefolded in the past few years. Particularly for arbitrary infiltration continuing for a long time, the prisons in Bangladesh frontier area remaining unimpaired with exceeding screwpress. Since double to threefolded excess inmates are being kept, out of their retaining capacity. Apart from this, increase in population is also one of the origin for growth of this figure. Besides the community of women are renouncing their domestic life at large, in effect offences are being entangled with various criminal activities even.

Well, compared to male the number of female offenders are much inadequate in this society yet. After due consideration of all these, freely it may be mentioned that the economical functions have flourished in this state and the larger society is existing in a warp and woof out of the socio-economic end. In other words, as if the fracas of leading the life in individual sense-enjoyment with ideology became all-pervading and ubiquitous (dilemma of existing or full-blown passive philosophy?). But we are looking for as if crime may not be aggravated. Since as much general offence would occur in the society, rather people will be frightened and the socio-economic acts of the society would be sustained indirectly. Necessarily efforts on behalf of the state will remain constantly as, with how far adroitness these sort of unsocial actions may be caught hold within a tolerance limit. However, it may be conjectured, the number of these inmates will flourish besides and even the puzzles of reformation of these inmates would be clothed.

Problems of reformation

In the decade of seventy about publicity and enlargement of the trend of thoughts have been initiated to reshape the jails into Correctional Homes overspreading the world and it came about pre-eminently to well-establish the civil-human rights activates. Here it is to be kept in mind that as much the conflict between personal interest and aggregated interest appears in intense and evident shape in prisons, probably observed nowhere else similar to that magnitude. Because a large number of persons are confined here within a short place, closed area taking away their liberty by force. These persons are adult, so it may be guessed that they fetch their own egotism out of different social strata and culture. This very egotism is pervasively attached with the individuality of the person, even hurt or afflicted. Probably persons make opportunities to unfold that egotism individually following their own findings and intellect evading the prevalent rules of prisons. Besides that, it is observed from daily activities the

prison authority instigate that egotism of inmates for the interest (?) of well managed administration conveniently, and suppress them holding responsibility of the aggregated interest or protection of security. As a result of this, enough effort caused to obtain for pulling down the inmates in the normal correctional procedure.

All the events, radical reformation in our criminal justice system would be the principal action, if considered from the viewpoint of this correction.

Yet day by day we are being able to realize, how many countless persons are moving constantly in the vestibules of courts with an expectation of fair trials, wasting their money collected with a great deal trouble and dissipating their efforts. The common people are having so much disregard, aversion, infidelity to our criminal justice system which produces downright adverse environs for reformation in the last sequence. Betterment of prisons in any manner is impossible unless this circumstances be redressed. So it may be expressed out of common inference, 70 to 80% undertrial captives have to be nurtured for a long more time, in our prisons. A large amount of government money would be wasted in consequence of this.

Apart, a considerable fragment of sick persons would remain within these captives and they will not receive proper nursing for their health, for the dangling sanitation of the prisons. Therefore they will die and the number of death in prisons would be increased.

Alongwith this, the previous topic should be repeated and mentioned exactly that humiliation of labour of the inmates in prisons as if pricked as our bothersome burden in direct succession. Heard that the central jail of Harare in Jimbaboe is self-sufficient in various instances. That is, they have been enabled to generate, almost the entire materials for the prisoner's daily-livelihood there. This is not a trifling matter. We cannot just imagine even this matter here. To be astonished yet that all the prisons in this state are situated almost in the centre of the cities with enough area of land being in possession. Under this findings, it may be said that the prison authorities of this state are the greater owner of land than all. But there are no system arranged properly here to make use of these land. As a result whoever turns up in prisons any day will find out, countless persons are killing their time by assembling rendezvous and gossiping for all day long. They have no activities, as if they have appeared as guests here to spend vacation for a few days. Still we realize, vacant brain is devil's workshop.

Notion of the staff

Even no society in the world nourish pleasing conception about the criminals or suspicious persons. In our society also the criminals are considered in a very inferior angle of vision. So it may be guessed, the prisoners receive right humane respect or behaviour from the prison staff in certain delicate cases only. They become accustomed to suffer exactly with these style of dealings by degrees. Whatever general grounds are shown to this effect, that is all these offenders have turned up by committing various type of incivil, criminal activities, so far what reason they may expect so well amenities or services in prisons? This type of intention of the staff sum ups one more dimension in negligence particularly to the sick prisoners. Many prison staff with sense of responsibility discloses to one another this very opinion that, should they deserve so much fondness like son-in-laws here, who have turned up by committing various misdeeds outside? At the same time it has been announced publicly to reshape the prisons in to correctional homes, in the light of human rights. But if desired

to perform that, adverse intention of the staff regarding the prisoners is the great hindrance. Because these employees work in the attachment with the inmates for a long time, therefore just the prisons can be reshaped to correctional homes by no means, unless this notion be modified. Of course it should be mentioned that variation of this notion is coming about, though in a gentle harmony. However, we may compose the following reasons, considered as the dilemma of correction.

1. The people in general never can admit this view that those who are involved in theft, murder, snatching and such other antisocial activities, eligible to have any healthy social support.
2. Notion of the staff in all stratum of the correctional homes subsist in this manner that any sort of welfare based function would cause obstruction for the security system of the establishment.
3. The staff can not adapt themselves to admit this matter that these antisocial persons will receive such remedy. Whatever medical service they do not obtain for themselves or for their dependants.
4. The confined inmates become detached from the medical service of the fundamental continuity and in effect they can not receive these opportunity and conveniences, for which they are aggrieved with the matter.
5. From the social orientation of the Correctional Homes reputation, fame, admiration, position and so forth are inconceivable just in this manner that the distinguished persons from the region of practice be reluctant to turn up there for service and to provide for adequate financial and different accessories apparatus for research work is not being possible.
6. The inmates are being deprived from the nursing of the womankind, since these institutions are predominated by male.
7. Suspicion, distrust, negation of reliance, as if overcasted ubiquitously in the atmosphere of these institutions. As a result, that very amazing heartfelt relation between the doctors and the patients matures outside or expected, is not reflected in this place in various instances.
8. Even the medical officers are desirous, they become frustrated to confer proper medical treatment and rehabilitation to the patients here, pre-eminently for dependence on judicial systems.

Punishment In the Prisons

Infliction of punishment in the prisons in more or less magnitude and in a regulated manner would be reinstated and the same would be actuated in the right instances, people of all category agree with this very matter. May be guessed, persons of a large number residing throughingly in a constricted overcrowding accommodation, consequently regular barter of malicious practices will take place just. Along with this it is apprehended that circumstances may be activated for rowdiness amongst them for worthless matters. Besides, most of these inmates are urged with emotion, so the staff have to bear in mind constantly an apprehension for somewhat occurrences abruptly. So they are directed for being on the alert ever. In different light, the other inmates consider the matter of punishment in many cases in this way that due reward for certain act or due retribution, penalty, indemnity for unjust harmful act or for doing mischief as a reaction and so on. Besides, more or less pious ideas even acts inwardly within everyone as suffering of consequences for misdeeds or committing a sin and such others. But it must be acknowledged that nowadays this punishment has been reduced unprecedentedly

by virtue and magnitude, compared to the previous time. Even though still the punishment is considered as of the means for reformation and everyone agree with such view that example-based punishment is needed. Still it has been observed that opinion for menacing and terrifying methods are being expressed in excess measures successively compared to actualization of punishment, as the rate of education has been accreted among the prison staff. Inevitably which produces screwpress in the mind of the inmates.

Whether the doctors would be attached within this punitive mode or not, that is a point at issue to be considered by reasoning. Since the most substantial part of medical treatment is, may not be of benefit, don't harm anybody in any case. So there is nothing to be ashamed to admit the fact that most of the doctors are not intended in this way that as much as service a patient deserves, the same should be conferred to him, even if a prison-inmate. Apart from the particular organizational antagonism, this is to be regarded that the doctors also are human being in this society. So this is not surprising even that they will bear more or less deformed idea regarding the under-trials and convicts. Without any doubt, affinity between the doctors and the patients suffer a loss because of this motive.

But if considered from another direction, the measures of punishment may be lessened much and humane by far if the doctors be attached with these entire system. Following the traditional and sustained prevalent conception, the medical officers are the healer in our social convention and the administrative officers are the ruler.

Custodial Death

Death of any nature in the prisoner are the events of special gravity and according to law all deaths are unnatural in the prisoner, until that is being possible to prove as natural. How far the occurrence of death in prisoner may be complicated and problematic usually, we are bringing forward such three instances to realize that.

'A' was an inmate of Alipore Central Jail for a long time. He was a drug-addict and convicted mainly in consequence of that. However, once he fell sick terribly. Diagnosed that he was suffering from 'renal failure', that is both the kidneys were almost damaged and it was irrecoverable. He would be demised. Notwithstanding he was treated medically. He was sent to all the medical colleges in Kolkata for few months together. Naturally it can not be expected that an accused from the prison would be treated better in the govt. hospitals, where the general citizens do not obtain opportunities for treatment in that way. In spite of that it was possible to get him admitted to the Nilratan Sarkar Medical College and Hospitals with great efforts and he defuncted there at a length of twenty one days.

After death, the magistrate recorded in the inquest report that there were eleven marks of injuries on his person. Subsequently specialist performed 'post mortem' of the dead-body and revealed that there were fourteen injury spots and expressed his opinion that he expired because of those injuries. At the same time, 'chronic renal failure' was pointed out as the cause of death in the death certificate issued from the hospital. The medical officer who performed post mortem, was advanced one step more and mentioned that those wounds were matured for more than one month. Here the puzzle is, he was admitted to that hospital before twenty one days. Therefore, he had received those injuries from inside the prison. Necessarily those sign of injuries were on his person, when he was admitted here. But no remark regarding those injuries exists in the bed-ticket of Nilratan hospital. This incident is being investigated

for the last ten years about and not completed yet.

Second example is of Dum Dum Central Jail. The person 'B' was a chronic alcoholic and a patient of cirrhosis of liver. Police arrested him for an assault case, took place in front of his shop. He entered in jail in the evening after spending the previous night in police lock up and the whole day in court lock up and in transit court van. The persons who observed him for the whole day, their remark was he enlivened the gathering by eloquent and nonsensical speeches. So nobody was strived to think out that he was strived to think out that he was suffering from some serious diseases. For that he was not sent to the jail hospital but kept in 'Amdani ward'. But he raised an uproar in the midnight and was set to the psychiatry ward for segregation. He expired at that night and the M.O. issued his death certificate in the early morning. Actually he was in a state of hepatic precoma complicated with delirium tremens (due to chronic alcoholism) at that time. It was reasonable to treat him very urgently at the hospital as an in-patient. But being compelled by circumstances and observing conduct and behaviour the others resolved it was nothing but insanity and sent him to the psychiatry ward.

The following third incident occurred in the Presidency Jail of Kolkata. The undertrial prisoner 'C' slipped down from the staircase and got a bump in his head. The attending doctor admitted him within a few hours. Few stitches were done in his forehead. But his internal injury was more venerable than the external injury, which was realized immediate after his death. That is, the patient was suffering from head injury, that was observed with great care by the M.O.. In effect, when he struggled in pain, the other inmates supposed that he was malingering to get more advantages. The prisoners also can not be blamed in this regard, since they have observed various persons to perform such type malingering. So nobody was anxious for sending him to the general hospital outside. Even the medical officer desired, he was influenced to be escaped from the botheration of sending him to outside hospital. As a result, he expired before comprehending anything.

Such countless incidents may be exemplified and pointed out, the unnatural deaths in prisons are complicated enough and prevention of that is not even easy to accomplish due to various contingency situation.

So it is science not the attempt to understand the natural world by explaining its phenomenology as causal consequences of spatiotemporally invariant laws. But to know the particularities of a given set of initial conditions in order to infer the details of later states reached by the operation of these laws, but we do not regard the resolution of such details as essential or causal components of the explanation itself.

Complexity of death

Recently persistence and consciousness among the people commonly aggravated about the deaths, so needless to say that eagerness about the death in prisons would be too much. Everyday various reports about deaths are being found in the newspapers. The reports of death in prisons are covered with importance within those. In effect, such impression in the mind of people grows instinctively that all deaths takes place in the prisons for oppression or inattention. Whatever conception may exist in the mentality of the people outside, the matter is not rather plain and simple as a matter of fact, as much supposed. Exactly for that very reason to discuss a little particularly about the death in prisons, is the subject of this composition. Because if someone desires to research in this subject in future, he may find

and follow the right course for that purpose.

The prisons are not hospitals. It is primarily security houses. Therefore it can not be expected that all the convenience and opportunities of outside state hospital would be available there. Though the patients die because of illness in the hospital also. Possibly various complaints subsist regarding those deaths even, but death in prisons matures with much more problems. Someone is confined here by pilfering his liberty. So if deterioration of his personal hygiene takes place in any way, everyone will point out towards the state with the finger. That is to say all the death in prisons are unnatural, until it is being proved as natural. Since the death was not happened in a liberated periphery in front of the related dependants of that person. Therefore anyone may be in a state of suspense that the person has been outraged and killed, or he died for non-receiving of deserving medical treatment.

Prisoner and Hospitals

Whereas medical services in the prisons are important above all, so we are worried particularly about the object just, that is by what means the general health services of the state and the prisons may be integrated with. Because the prisons are not hospitals, but a place to confine the convicts and the undertrials. So whoever would be indisposed here, especially the captives suffering from schizophrenia or chronic diseases of various type, to provide the exact medical service for them the prison hospitals should be moulded afresh and this system would be managed with combined undertaking of the health service. It may be mentioned as an instance that this provision is current in Great Britain during the last twenty years.

It may be revealed through discussions with the proficient medical officers active in prisons, that the uppermost and great problem of medical service here is the absence of arrangement to provide for appropriate medical service to the severely indisposed captives. Because it is observed that a lot of patients may be revived possibly, if treated with deserving medical arrangements in proper time. But a band of active medical officers and non-medical staff, always ready for confrontation like the civil defence service is required for this, who will rush and exert to cure the captive from sickness in need. Moreover they will transfer him to the hospital outside, if comprehended the condition is beyond their control. But it is not possible to make such arrangements in all the jail hospitals of the state. So it would be more convenient for service, if arrangements for such kind of 'intensive therapy' made in a few jail hospitals only. At present the sick prisoners are being sent to Alipore Central Jail usually, from the other jails of the state. In effect, when the patients arrive at Alipore after wasting a long time and turning round a long journey from the small and large marginal jails, at that time they subsist in such a worsened condition that the serviceable time for well treatment is not obtained. So being alarmed, the doctors simply transfer them to the outside hospital as early as possible and accomplish their responsibility.

Generally the patients remain admitted in the outside hospital with various diseases. But all those are not patients who turn up in the prisons. Though many of them remain sick and derived from various causes they fall sick rapidly. At least some of these illnesses are certainly malingering, which reflects sufficiently among the drug-addicts. However in a majority of these cases are illnesses due to malnutrition. Perhaps just a little morbid affection of the psychiatry problems (psychosomatic or somatization problem) are present in excess among these inmates. But this subject must be considered that why sick persons to such a great extent are

found in an assemblage of men of this nature. Incidentally it is worth-mentioning that not only among the prison inmates, the magnitude of illness among all the active staff of these institutions are numerous multiplied compared to the general assembly of persons.

However, the methods of medical treatment in the prisons are of a little different kind and in many occasions it doesn't match with our familiar treatment system. As a result, whoever the doctors turn up here for service without having previous experience, they feel inconvenience enough to work here harmoniously with their experience of outside training. For this reason, they meet with obstructions in several occasions and become almost mechanical to perform the obligation merely in a passive way, finding no way of accomplishment. To be released from these circumstances, deliberate arrangements for mutual exchange of experience and orientation is needed with these doctors at intervals. But till yet, no arrangement in this fashion became possible in this state.

Prisons of today

Discriminately it may be divulged about the condition of the prisons of present day that any prisoner expires as a result of direct oppression while staying here, such incident happens nowhere. Yet such an incident may befall occasionally that the captives became injured as a result of exchanging violent behaviour with each other. In these cases, complaint may be raised against the authority for inattention of duties. Otherwise such may happen that perhaps someone within the staff has instigated or imputed friction among the prisoners for attainment of their own objects. But the matters form such a complicated shape that it becomes impossible to find out the guilty person and conflict punishment upon him. Therefore in these instances, the means of prevention are to bring up humane perspective entirely about the captives of prisons, among the staff.

However, probably a few classification of the causes of death in prisons in this manner is possible, if reckoned.

1. Death caused by natural illness specially due to chronic degenerative diseases such as diabetes, hypertension, tuberculosis etc.
2. Death caused by inattention of treatment
3. Suicide
4. Death caused by receiving injuries in strife
5. Death caused by various illness for chronic psychiatric illness, and such others.

In present times there are about twenty thousand captives approximately in the prisons, among themselves almost eighty percent are under-trial prisoners and on an average two or three incidents of death in prisons are observed in a month by turns. Naturally a major part of these aggregated death befalls within the under-trial prisoners. These under-trials turn up in the prisons in an enough worsened condition. Usually ninety five percent of our prisoners are of indigent category just. So the quality of their life is extremely inferior, in effect a part of them suffer from malnutrition. Besides, they can not find the opportunity for proper treatment in need, for involvement with the underworld for a long period. Moreover a great part of them are drug-addict of different varieties, as a result various diseases caused by ill-nourishment such as tuberculosis, anemia, bowels complaint and so on aggravates within them still more. On several occasions, they take an intoxicating drug or liquor by disposing of blood from their person even. For these different reasons, it is observed that the preventive

power of a disease in their physique remain less comparatively. Besides, the probability of being irregular is much more in cases of their treatment for tuberculosis, even after commencement (discussion followed).

Consequence of crime

In addition to this, illness of the undertrials caused by injuries are there. If someone falls before an agitated crowd as a suspect for any type of offence or accusation, or be oppressed in the police lock up, either loses his life or be injured deadly. Various prisoners are being compelled to spend the days in prisons in a critical situation in this wounded or injured condition of this nature. In many respects it is not possible to realize the seriousness of the internal injury, as the corroborating external injury is not remains. So very likely the patients expires abruptly.

The general practice is to take away certain detinue to the police lock up. Next day he is produced before the court and the police may fetch him to their lock up again for the purpose of further interrogation or other investigations subject to approval of the judge. He turns up in the prison after staying there for some more days possibly. Occasionally he get released, if enlarged on bail. If indisposed in the police lock up, he is being carried off to the hospital outside and brought back again to the lock up or prison, after being admitted there or examined in the emergency department. All these provisions are for the time of distress or transient just and are not so steady. Such as provision of treatment in the police lock ups are ridiculous and it is not a very easy act to realize the exact phenomenon of illness of a patient distinctly with malingering. Besides the work load on the police has increased by far dimension simultaneously with the growth in population. On this side no proper arrangement has been made there for medical treatment of sick captives yet. In other direction, in a majority of cases no exact service or co-operation of all kinds are obtained in the matter of medical treatment of the prisoners, in the govt. hospitals attached with the health services. So in many cases, even a prisoner falls sick seriously, police attempts somehow to place him in the servitude of jails. Still it is needless to say that even turned up in prisons, to arrange for proper medical service for such a sick captive become complicated and hard to accomplish.

The hospitals in prisons are of much old type and it is not an easy action to devise the infrastructure of modern medical management there. In another direction, no communication or combination is there between the prison department and the health services, who are at the helm of medical services of this state. At present, medical officers are appointed in all the Central and most peripheral jails in this state, but they do not obtain the opportunity to reflect the effective skill of their of their own job in a majority of cases for non-existence of appropriate infrastructure. Almost in entire cases, somehow the doctors or their medical subordinates manage the job work of treatment by trained and tutored long-term convicts. Naturally, an excellent standard of medical service in this way, can not be expected. Simply this consolation just stands as a support at that time that a doctor is staying beside the prisoner in a critical position of illness. So these doctors were mentioned in former times, humorously as 'antarjali (immersing the lower part of the body of a dying person in to the water) doctor'. Because at that time, most of the doctor's job was to write the death certificate of the prisoners, after their death. There are no doctors in the small jails of this state, so no means are there expect to transfer a sick prisoner rapidly to the outside hospitals in moribund

condition. It may be gussed that various spontaneous faults and failings would be there in this method, in effect awkward incident as regards to death in prisons may befall even.

Medical treatment in the prisons

Briefly it may be mentioned that the peculiarity of medical treatment in the prisons are a doctor will check up the patients and prescribe some medicines, within the scheduled time for 'outdoor' in the morning hours. That very act would be done by a pharmacist in the small jails, without a doctor. Moreover advise would be given to send the patients to the outside hospital swiftly, if any urgent condition occurs caused by illness. To perform just this act even, presence of a doctor is always needed particularly in the large jails, but that arrangement is not yet provided for.

There are various small and specious hospitals of different dimensions in the large jails and those are of special type. The sick prisoners are locked up there inside a large 'file' together. Therefore the charge to take care of the sick prisoners have to be entrusted with the practical skill of the fellow inmates. They are trained just a little as per convenience and opportunity and certainly they exert to serve the fellow inmates by applying their acquired knowledge and intelligence. Besides, they maintain a mystic concomitance for the fellow inmates, but this must be admitted that most of the prisoners are illiterate and merely a little educated, who serve nursing here. As a result, how far a patient is sick, whether he is malingering or not, how much emergency condition has been created by his sickness, most of the prisoners are not having the knowledge or experience to perceive these matters. In effect, when the doctor gets this information that some patient is in a critical condition, possibly that is the last stage of the patient at that time. Besides, even the doctor remains, the security surroundings of the prisons are such problematic that so much precious time is wasted to arrive beside the indisposed patient at the dead of night for a doctor.

This opinion should be added with this, that the western system of medical treatment is highly expensive and the disposals for its investigations even are extremely complicated. It is not lucrative also on the economical side to provide for these system in any prison. Because for introducing any modern investigative equipment in the prison-hospital such as ultrasonography, endoscopy the amount would be spent for appointment of a trained worker and for the accessory managements, patients in that measure wouldn't be found here precisely. So it would almost be the same as wastage in much cases to introduce all these systems. Still the specialist doctors of the hospitals outside give advise for these most recent investigations arbitrarily and according to their pleasure after attending the prisoners. In most of the cases, the prison-administration become totally exhausted to fulfill those opinions perfectly. Better to say, the prison-administration fails to provide for these prescriptions in many cases, therefore the medical treatment of indisposed prisoners become more complicated gradually and hard to accomplish. Since the authentic medical treatment of a prisoner can not be initiated untill those investigations are being completed.

Observing with great care about all those problems it seems, there are four ways to solve this intricated situation concerning death of prisoners.

1. Most of the captives in our prisons are undertrials or in-custody. So they frequents continuously, therefore several mishaps may be escaped if provision remain for an immediate, necessary, full check up immediately after admission in the prison.

2. Merely a single 'emergency department' should be running in all the large and moderate prisons, so that the department may fix any disposal in an emergency state.
3. As much as a prison may be uplifted centrally with modern medical services, that should be effected and methods for recording of all the facts concerning the illness of indisposed prisoners should be there.
4. There should be a steady provision in the Govt. hospitals adequately for treatment of the prisoners in sickness, getting them admitted.

On this occasion, we will discuss about the medical treatment in prisons and a few important side of death of prisoners, related with that.

Pulmonary Tuberculosis

We understand that tuberculosis is one of the diseases from the time immemorial. Mycobacterium tuberculosis, a kind of bacteria takes part with a complex process of metabolism and pathological process in the body and express this disease. The disease tuberculosis usually attacks the lungs by 75% and the rest bit may attack any organs of the body. It is possible to be cured from this disease thoroughly, if treated in proper time and the treatment not made unrestrained. But it is observed that half of the patients die within five years, if not treated precisely.

Outbreak of the disease, tuberculosis has thrived world-wide, particularly in the backward countries numerously. Even for the dreadfulness of AIDS sidewise, this disease has increased by far in some of the European and American countries also. As a result, the World Health Organization has declared this disease as 'Global Emergency' directly in the year 1993.

Still that stale sample investigation of 1955-58 is being applied to realize the exact position of the disease tuberculosis in our country. Thereafter in the year 1992 the national and international specialists carefully considered the facts in our country and proclaimed that merely 33% of the tuberculosis patients complete their treatment in our society. They have mentioned as is motive:

1. Non-availability of required fund,
2. Trend to diagnose with the help of only chest X-ray findings,
3. Drop out of treatment by the Primary Care Physicians and or patient,
4. Inadequate or non-motivated staff to work in an organized way, for these and such other reasons the positions of tuberculosis has become more complicated in this country.

The National Tuberculosis Control Programme is revised (RNTCP) and modified as DOTS (directly observed shortcourse chemotherapy) now. In the year 1977, this DOTS programme was established in Tanzania at first, under the management of Dr. Cassel Stybo. It was observed that 80% recovery is possible in this way. Even the programme is introduced, this phenomenon is not fulfilled in our country during the past ten years, mainly for non-comprehension of this management exactly by the doctors (of all stratum).

The method of treatment is considerably difficult and complicated for these patients in the prisons. Because most of the inmates in our prisons are undertrials and probability of being suffered from tuberculosis is too much among them. Since many of them are accustomed to lead a poor quality of life. Therefore probably some of them were being treated outside, but the treatment became irregular for being jailed. Moreover probably the disease of the confined person diagnosed here and he was treated for a few days in the prison hospital, but he went out after being released or being enlarged on bail. Hereafter the treatment postponed there for

various reasons. Such innumerable incidents may be pointed out and mentioned that in cases of the prison inmates, enough probability remains for being treated irregularly.

But no means are there to make out the exact number of prisoners suffering from this disease or dies. Since the act of proper documentation is not done precisely about the disease or death of custody. In fact, such may happen that possibly certain prisoner expired for being attacked by pulmonary tuberculosis, but the same is pointed out as a death caused by 'heart attack'. Though now a days it is mandatory to do a post-mortem for each and every death in custody, so possibility is increased to know the actual cause of death.

One more point deserves attention here. The Revised National Tuberculosis Control Programme (RNTCP) is currently extending all over the country and the prisons of this state are under the pervue of it, but the prison inmates are being deprived from the convenience and opportunities of this type of programme, as no such awareness exists amongst the prison administration and the health services.

The disease tuberculosis be infected from a person to another person, because the hidden bacteria within the airborne droplets, which comes out along with cough or spittle. It is reflected through a computation of the World Health Organization that such a tuberculosis patient, whose cough bears the tuberculosis bacteria will transmit this disease at least ten persons a year if remains in that indisposed condition. So it may be guessed that in the prisons the risk of being infected by this disease is too much, where the inmates are kept extremely in a throughing position. We observe that this disease is being recorded very delicately in the society outside for different motives. Therefore easily it may be concluded that this state would be much worsened in the prisons.

It has been mentioned before that those tuberculosis patients with sputum positive tuberculosis bacillus, transmit this disease in excess amount above all. Therefore bacteria of tuberculosis is needed for contamination of this disease but for sprouting of the bacteria. Here soil or malnourished, ill-health body is more important than seed. Moreover it is observed that somewhat persons in the age group within 16 to 22 years, may be infected very quickly by this disease. But still we haven't realized the exact reasons behind this. That is symptomatic manifestation is not revealed in all the cases, whoever be infected by this bacteria. Merely ten per cent individuals reveal the symptoms of this disease after infection. The incidents of repeated infection by this disease is observed in excess in those area, where its outbreak is too much. For this reason it is supposed in the cases of patients with symptomatic manifestation of tuberculosis that, at least one third of them have matured this disease by reinfection of this bacterium recently.

The disease tuberculosis is observed in excess among the adolescents above all, during the period of 16-22 years. Moreover, it is noticed that their disease sustains a severe shape. Almost one third of them dies within one year of diagnosis of this disease if not treated and half of them dies within five years. 60 per cent of them who survives, recovers spontaneously. However the remaining part continue spreading of bacillus as chonic infectious disease. Major part of these patients come round completely, if treated properly. But if the treatment be irregular, these patients do not die indeed, most of these chronic patients continue spreading of formidable drug-resistant bacteria.

We may consider about the outbreak of tuberculosis in the prisons, by observing such an analytical picture in front. The problem is, it is improbable to obtain the fact precisely in this

affairs, since documentation of any illness are not preserved properly in the prisons. Therefore we have to cultivate this depending on arbitrarily partially. There are captives of two kind in the prisons, undertrials and convicts. For how long the undertrials will stay in the prisons, that depend on the courts. Necessarily it takes enough time to initiate treatment after diagnosis of this disease, as the healing period of tuberculosis is prolonged. Consequently the captive get released on bail or be acquitted just after initiation of treatment for a few days probably. In effect, his treatment become irregular even.

Besides, the convicts are being sent to the Central jails usually. Moreover in many cases they are being sent to Alipore Central Jail from the other Central jails. After a periodic treatment there, again they are being sent back along with a prescription. This treatment for tuberculosis is done in accordance with the prescriptions of the outside hospitals-outdoor generally. Besides this, the doctors of Alipore Central Jail performs the treatment of tuberculosis with the help of pathological test reports of sputum, blood, X-Ray images of chest etc. of the suspected patients. Incidentally it is mentionable that the DOTS programme is introduced in the Alipore Central Jail, during the last few years.

It has been divulged before-hand that usually no papers relating to their health problem remains with the prisoners, when they rush into the prison-houses. So, in case of any inflammation or problem of lungs exists, they attract the doctor's notice and treatment begins in the jail hospital. If not relieved, they are being sent to the outside state hospital subsequently and those patients are observed following the advice of that hospital. In cases of the convict prisoners, very likely chances are there for a thorough medical treatment but the under-trial prisoners are being acquitted and walk out in a majority of cases, while being treated. It may be concluded that in 95% of cases, possibility of incomplete treatment of tuberculosis remains for the under-trials, in this strain. Generally these tuberculosis patients suffers from malnutrition. Therefore the treatment starts after getting them admitted in the hospitals, at least for the first few months.

This is a fact that no medicine should be deficient in the prisons in black and white at least. But an explanation is not needed to convince that various problems may be shaped in most of the captives, during several months together. Although the advantage is, nearly all the tuberculosis patients are adult, for that they may procure these drugs very likely, if desired. But the probability of irregular treatment increases by far when they are disinclined or mental patients. Besides probability of irregular treatment remains enough for those convicts, who are transmitted for the purpose of treatment from the jails outside and returns back to their own jails shortly after.

It has been ascertained by post-mortem subsequently after the death of prisoners that nearly 10% of the incidents occurs because of pulmonary consumption, amongst the entire incident of death in the prisons of this state. Due to the outbreak of AIDS, this topic has composed a problem recently, although that is not worth highly mentionable. Similarly not that the drug addicts suffer from this disease exceedingly. Comparatively it may be mentioned that such a little patients are there in the frontier prisons, perhaps not having tuberculosis but obtaining a regulated treatment for the same. Yet in another direction, even such patients would be found staying without treatment, despite of having tuberculosis. Apart from this, a few incidents befalls of receiving the treatment of tuberculosis uselessly, when it is observed that the treatment is managed relying on the X-Ray images of the chest merely, without a

regular investigation sputum. Since according to the view of WHO, in 33% cases of tuberculosis in our country, the treatment is done on the basis of the X-Ray images of chest or hypothesis only.

However, the bacillus of tuberculosis matures as drug-resistant if treated irregularly. In effect, its management become almost impossible in the prisons. On the other side these drug-resistant bacilli spread the disease successively, as a result probability matures for spreading of the disease. This risk factor exists in the prisons excessively, since innumerable captives are compelled to be kept here throughly together with equal pace.

Apparently there are three directives in the phenomenon of treatment for tuberculosis, because of that the doctor's even oscillate in confusion a little. Firstly The WHO recommends to observe a directive, what our National Tuberculosis Control Programme department circulates as cultured programme actually. There are references of various methods for treatment in the text-books of therapeutics. Besides, the specialists of the Govt. hospitals refers a method. Being close upon all these under disposal, doctors of the jails manage following their own sagacity and reflexion in a majority of cases. Problem is there are no senior doctors almost in all the prisoner of West Bengal, to check up these matters minutely.

Therefore not only tuberculosis, it not very difficult to speculate the sequence about the standard of entire medical services in the prisons, even everything in neat order.

Just this subject is called medical audit system in the foreign countries. There are no such provision in the out-hospitals even, so we can not expect the same in the prisons. All the doctors sit down and discuss together to check up whether any negligence are there regarding the medical service to the patients suffering for a long period, which is possible merely within this infrastructure. Apart from treatment, objects are there to review any incident of death of prisoners and to check up whether that very prisoner had received, the service or not, which he deserved. If not received, the observers will investigate for the instances of omissions and failings, and will exert to make amendments for those, with their utmost efforts.

In this connection it may be mentioned that in most occasions, the condition goes out of control in the prisons, when the chronic psychiatry patients be attacked with tuberculosis. Since that problem can not be solved by administration of drugs and treatment simply, malnutrition subsists within them. In effect their disease sustains much complicated state, being the victim of inattention besides.

In the prisons also, tuberculosis would be possible to fetch under control in that case only, if diagnosed as fast as possible and treated, just like outside. It is to be kept in mind that tuberculosis patients do not die in our country for shortage of medicines, but for the absence of exact service or close supervision. This disposal of service is so tottering that it is supposed to be an impossible action almost, to establish it with firm legs and thrust in to move.

Life-term convict Ananta Bag

Ananta Bag was a life-term convict in Alipore Central Jail. On the 2nd January 1999 he informed the attending doctor at out-patient that he is feeling feverish, wheezing the throat, bodyache and headache, difficulty in speaking and suffering from insomnia. For one week he was treated usually at that time. At the same time he was advised to take bed rest and rest to the voice. But when it was absorbed that his ailments wasn't reduced, he was checked by

the E.N.T. specialists and X-ray of chest, blood-test etc. were done in the prison.

The E.N.T. specialist examined him on the 9th January in a proper method and his vocal chords were checked subsequently in unconscious state even. It was observed that the vocal chords of his left-side were not moving exactly but static. However no growth can be detected. So the specialist suggested for blood test and another X-ray of his chest again, after medication for a few days more. But no result received so far.

Being compelled the doctors of the jail sent him outside to the chest department of the Bangur Govt. hospital close upon. The doctors there suspected that 'Ananta' might have been attacked with pulmonary tuberculosis. Therefore they prescribed some medicines and advised for a few more tests and observations. But even this was not efficacious to 'Ananta'. Meanwhile the tests and observations were completed and he was sent to the Bangur Hospital again. After consideration the specialists there advised 'Ananta' for a check up at the chest department of P.G.Hospital, Kolkata. Besides, the physical condition of 'Ananta' was deteriorating. His utterance was ceased, moreover he was not able to swallow, in effect the symptoms of malnutrition reflected.

He was sent to the P.G.Hospital, Kolkata on the 10.02.99. the specialists there treated him with a heap of medicines and advised for various tests and observations once more. To remove cellular tissues from a lymphatic gland close upon the throat and search through FNAC test whether the cancer cells already spreaded within those glandular tissues, was to be investigated few weeks for that investigation and was sent back to the P.G. Hospital again after receiving the report of the same. However the doctors were not convinced enough with that very FNAC report. He was advised for the same test from any private hospital once again.

But the condition of the patient deteriorated in the mean time. Blood ejected with his cough and vomiting. In this condition, he was sent to the emergency department of P.G. Hospital on several occasions, but he couldn't be admitted there or no result was received. However he was sent to a private clinic on the 03.03.99. for that very test in that condition, when he felt comfortable a little, FNAC test was performed there and its report was received on the 10.03.99.. It was revealed by the report that onset of cancer within those tissues already started. However it was possible to present himself before those specialists of P.G. Hospital on the 15.03.99. again. This time the specialists advised him for admission in the radiotherapy department, after a clear scrutiny of those reports. But the doctors of the jail somehow managed him to be admitted in the Chittaranjan Cancer Hospital by their self-exertion and pursued the treatment, as it was not possible to get him admitted in that hospital in any way.

The doctors of the Chittaranjan Cancer Hospital checked up Ananta and advised for a set of tests and observations once again. Among those a difficult test was there, which was extremely complicated and possible to be performed in the P.G. Hospital exclusively. This time Ananta was harassed for performing those tests and observation by moving about constantly from one hospital to another hospital. On the 19.03.99. it was possible to perform an ultrasound test of his chest and abdomen at the cancer hospital, but he had to confront the inconveniences beyond all to perform the CT scan of chest and biopsy of the lungs. He had to be admitted in the cardiothoracic department of P.G. Hospital, but it turned to be an absurd event to possess a bed there.

Even in this instance it was possible to get him admitted in the P.G. Hospital on 03.04.99. by the doctor's own effort, after turning round for a long time. Further it was possible to

perform all the tests and observations within the 10.04.99., which was an unimaginable event on the side of P.G. Hospital also. However it was not possible to get him admitted in the cancer hospital again, even after completion of these tests and observations. Hence he had to count the days for his death up to the 16.04.99., in the hospital of Alipore Jail.

In a different way, it was possible to release him from the prison within the next week, by the self-exertion of the jail doctors, filing an appeal to the Govt. to this effect that he is at the threshold of death. As a result, it was possible to evade another 'death in prison'.

P A S

J D Bernal : Philosophy, Politics and the Science of Science

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Abstract. *This paper is an examination of the philosophical and political legacy of John Desmond Bernal. It addresses the evidence of an emerging consensus on Bernal based on the recent biography of Bernal by Andrew Brown and the reviews it has received. It takes issue with this view of Bernal, which tends to be admiring of his scientific contribution, bemused by his sexuality, condescending to his philosophy and hostile to his politics. This article is a critical defence of his philosophical and political position.*

Why is J D Bernal being honoured in Ireland today?

It is because he emerged from this part of the world to become a scientist of world renown. It is also because he pioneered the discipline variously called STS (science technology society), social studies of science, science studies, the science of science. Although he reached the heights of established academe, he engaged in a radical critique of its cherished assumptions and structures of power. He was a leading light in a movement for the social responsibility of science. He was an activist in many causes. He brought science to bear in war and then turned his energies to peace. He led a complicated life, living an unconventional domestic life, sitting on hundreds of committees and playing a leading role in many scientific and political organisations.

His legacy is complex. All the more so because he was marxist in philosophy, communist in politics, polyamorous in sexuality. On these matters, many have ambivalences about him, even part ways with him. Nevertheless, I want to make a case for these more difficult dimensions of his legacy, focusing on his philosophy and his politics. Moreover, I want to argue that these were central to who he was and the contribution that he made and not somehow peripheral.

Bernal is the subject of renewed attention just now, not least because of the publication of Andrew Brown's recent biography of Bernal [1], but for a number of other reasons as well. There were events this year (2006) at Princeton University and at the Science Museum in

London marking the 75th anniversary of the 1931 international history of science congress where Soviet and British marxists came into such consequential interaction with each other. This was a pivotal event in the intellectual development of Bernal.

At the congress, contrasting world views were in collision. This event received much publicity in Britain at *ence at the Crossroads* viet papers from the translated into many enduring impact over ades. Bernal was the Soviet thinkers as tending this influence. tered Bukharin, Hessen 1931, he was struck by integrality, and social delegation in contrast leagues with their un- and remoteness from

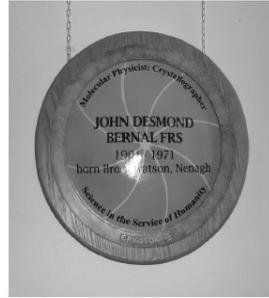


Figure 1. Plaque in honour of JD Bernal Nenagh, Co Tipperary 2006 (photo HS)

the time. The book *Sci-* [2], containing the So- congress, has been languages and has had the world and over dec- strongly influenced by well as influential in ex- When Bernal encoun- and their colleagues in the unity, philosophical purpose of the Soviet with their British col- disciplined philosophies social considerations.

Twenty congresses later, there was also much discussion of Bernal, his contemporaries and their legacy at the 2005 international history of science congress in Beijing. There are also whatever forces have brought the legacy of Bernal to the attention of the Institute of Physics in Ireland and organised the Limerick event on Bernal and are considering setting up a Bernal Institute. There has also been much attention to Bernal, including several biographies [3], between the years of his initial impact in the 1920s and today.

There are various views of Bernal in play. Decades after his death, he still stirs controversy, although perhaps not quite enough. There is, I believe, a consensus about Bernal emerging and I want to contest it. I particularly want to address the attitude to Bernal pervading the Brown biography and the reviews of it that I have seen in recent months.

The Brown biography of Bernal is an extremely valuable work of scholarship. I learned much that I did not know about Bernal and much else from reading it. However, I do not concur with his attitude to Bernal. Brown is admiring of Bernal's science and his war effort, matter of fact about his sex life and condescending about his philosophy and his politics. Most reviewers that I have read take this stance as well. The book has been widely praised, not only for its scholarship, but for its overall judgement of Bernal.

What is being said about the philosophy of Bernal? Very little actually, either by Brown, despite a book of 562 pages, or by reviewers. It sometimes seems as if the very mention of dialectical materialism somehow makes the case that it is self-evidently ridiculous. Brown quotes Michael Oakeshott, conservative philosopher, as accusing Bernal of a "*primitive passion for analogy [that was] almost unchecked and the result of a mystical and esoteric philosophy which can be paralleled, perhaps, only in the writings of the alchemist*" [1]. The TSL reviewer followed a repetition of the Oakeshott quote with the pronouncement that "*the real spells were those that scientists cast over themselves*" [4].

The reviewer in *Nature* wrote : "*In the 1930s, Bernal became committed to marxism. How a man with such a marvellous analytical mind could come to terms with dialectical materialism*

is still a subject of discussion – it seems to have been an act of faith, a substitute for catholicism" [5]. This cliché about catholics who become communists is quite familiar to me and it is extremely objectionable. It inevitable comes from those who have been neither catholics nor communists nor ever studied either seriously. Let me admit that I take this quite personally as a catholic who became a communist, although for most of my life I have been unable to live within the confines of either the Catholic Church or the Communist Party. It is also why I believe that I understand this about Bernal as well as Caudwell [6] and others who have made this transition. It is something much deeper and much different from what this glib jibe implies.

Catholicism instills a taste for totality : a comprehensive world view and a radical moral commitment in relation to it. This integrality often survives belief in God and all other articles of the faith of our fathers (and our mothers). What often lies in between one world view and another is a serious philosophical quest in which many alternatives are considered. Those who judge it must earn their right to such judgement with a philosophical argument worthy of the intellectual process they are judging. I do not believe that Brown or his admiring reviewers have done this.

Bernal came to marxism seriously and intelligently. He found in its philosophical framework a structure in which he could live, think, create, pursue science, act politically and develop further. It opened him radically to the world, rather than closing him down or constricting him, as critics imply. Andrew Rothstein once described the effect of becoming a marxist on J B S Haldane, who was already a mature scientist when he came to marxism, saying it had an 'open sesame' effect as he ranged through the whole body of knowledge that he had already acquired and then pushed on further [7]. I believe that it was the same for J D Bernal.

What is the philosophical position of marxism that is held in such scorn by these commentators [8]? It is materialist in the sense of explaining the natural world in terms of natural forces and not supernatural powers (which, by the way, is as radical a break as it is possible to make from catholicism). It is dialectical in the sense of being evolutionary, processive, developmental. It is radically contextual and relational in the sense of seeing everything that exists within the web of forces in which it is embedded. It is empiricist without being positivist or reductionist. It is rationalist without being idealist. It is coherent and comprehensive while being empirically grounded. It needs constantly to be revised in light of the most advanced science, the most up-to-date knowledge, of its time.

It is a way of seeing the world in terms of a complex pattern of interconnecting processes where others see only disconnected and static particulars. It reveals the way in which economic structures, political institutions, legal codes, moral norms, cultural trends, scientific theories, philosophical perspectives, even common sense, are all products of a pattern of historical development shaped by a mode of production.

Bernal considered the marxist philosophy of dialectical materialism to be the most suitable philosophy for science. His philosophy of science was in the tradition of Friedrich Engels. The important thing about Engels's concept of nature, Bernal argued, was that he saw it as a whole and as a historical process. In Bernal's opinion, if this philosophy of science had been more widely known in the scientific world, theories underlying relativity, quantum physics, biochemistry and genetics might have been discovered sooner and would be free from the idealistic confusions under which they were suffering.

For Bernal, dialectical materialism was the most powerful intellectual current of the time. It provided the basis, not only for a revolutionary social movement, but also for the enhancement of science. It was a philosophy derived from science that brought order and perspective to science and illuminated the onward path of science. It was no substitute for science. It was no royal road to knowledge. Induction and proof remained what they were and the hard work still had to be done. It was not a dogma imposed on the findings of science from without, but a method of co-ordinating the experimental results of science and of pointing the way to new experiments, a method that had been developed in and through the development of science itself. Its role was to clarify and to unify the different branches of science in relation to one another and to other human activities and to suggest directions of thought that were likely to yield further results in the future.

He saw dialectical materialism as a science of the sciences, a way of integrating the sciences, a way of contextualising science in deep socio-historical perspective. He saw marxist philosophy of science as a means of overcoming overspecialisation and achieving the unity of science [9].

A resolute monist, Bernal saw the unity of science as grounded in the unity of the universe itself. He affirmed the unity of the universe, not in a hollowly reductionist way, but in a way that recognised the intricacy and complexity of matter that had evolved in such a way that new qualities emerged at higher levels of organisation. The origin of the new, however, had to be seen against the ongoing process, so as to avoid the two extremes in which the immediate apprehension of quality was made the basis of mystical speculation on the one hand or mechanically denied altogether on the other.

Bernal saw science as a social activity, integrally tied to the whole spectrum of other social activities: economic, cultural, philosophical and political. His sense of history was sweeping and every particular was placed within an epochal grand narrative [10].

Bernal's book *The Social Function of Science* of 1939 quickly came to be regarded as a classic in this field [11]. Based on a detailed analysis of science, both under capitalism and under socialism, he argued that science could achieve its full potential only under socialism. According to Bernal, science was outgrowing capitalism, which had begun to generate a distrust of science that in its most extreme form turned into rebellion against scientific rationality itself. The cause of science was, for Bernal, inextricably intertwined with the cause of socialism. He saw science as holding the key to the future and the forces of socialism alone as gathering to turn it. Later he developed this historical analysis further in his multi-volume work *Science in History* [10].

He was extremely critical of alternative philosophies of science, both of positivism and of many forms of anti-positivism. He was unsympathetic to tendencies to equate science with positivism, but even more so of tendencies that were so preoccupied with the critique of positivism as to undermine science. He thought of irrationalist and intuitionist currents as the backwaters and dead ends of human knowledge. He objected most to scientists, such as Jeans and Eddington, who were bringing irrationality into the structure of science itself and making what science did not know, rather than what it did know, the basis for affirmations about the nature of the universe. These trends have multiplied since his time. He would be polemicising against both neopositivism and postmodernism if he were alive today for the same reasons.

Bernal was a leading force in a new movement for social responsibility in science that took a number of organisational forms, such as the Association of Scientific Workers and the Division for Social and International Relations of Science within the British Association. This movement had impact as well as opposition. The oppositional manifesto was John Baker's 'Counterblast to Bernalism' and its organisational form was the Society for Freedom in Science, which devoted itself to the defense of 'pure science' and the absence of any form of social control of science. Bernal believed that all science was inextricably enmeshed in social forces.

Bernal functioned in terms of *Weltanschauung*. Science, philosophy and politics were all tightly bound together in his highly integrated mind. He took issue with those who believed that science could get along quite well without philosophy or politics and refused to see the unexamined philosophical and political assumptions masked by this stance.

Anyone who claims to understand Bernal without understanding this integrality, particularly the relation of his philosophy and politics to his science, does not understand him. The reviewer of Brown's biography in *Science observed* :

"Although agreeing that Bernal's science and communism were two sides of the same coin, the author continues to see the political side as 'counterfeit' and in the end fails to make Bernal's position understandable." [12]

I agree.

To understand Bernal is to understand the interconnections. Martin Bernal, who has turned out to be as controversial as his father and who also comes into my history of ideas lectures at DCU, dedicated his much acclaimed, much denounced book *Black Athena* to his father "who taught me that things fit together, interestingly" [13]. As Alan Mackay has put it: "*His picture of the world was a unified one and he fitted new facts into a changing whole*" [23].

What is there in his politics and his philosophy to bring forth the scorn of contemporary commentators? What more appropriate philosophy is there for a natural scientist or anyone else? positivism? postmodernism? theism? As for politics, what sheds more light on the world that we inhabit? neoliberalism? neoconservatism? In the name of what are these commentators so superior in passing such judgments? What philosophical, what political, positions do they embrace? They do not say.

There are other positions, even in ivy league academe. Interestingly Loren Graham of MIT, who has spent his whole professional life studying Soviet and post-Soviet science and philosophy of science has said of dialectical materialism: "*This philosophy of science is actually quite a sensible one and corresponds to the implicit views of many working scientists all over the world*" [15]. Graham, who, incidentally, is not a marxist, goes on to show that this philosophy has had a lasting impact on Russian scientists, even after the demise of the Soviet state [16].

About the Soviet Union : this is an area where Bernal has come in for much criticism. Yes, I concede that he should have been more critical of the USSR. However, I think that it takes a lot more than repeating dominant media cliches or even reading books by Pipes or Conquest to constitute a basis for judging his position [17].

The USSR was a vast transformation in the history of the world. It was an attempt to expropriate the expropriators of the world, to bring enlightenment and equality where there was darkness and despair, to honour labour and to seize power from those who parasited upon

labour, to create a society according to the principle "from each according to their abilities, to each according to their needs". It brought about a massive shift in the balance of power in the world. It was a heroic undertaking. It was full of brilliant and honest thought and brave and generous activity.

Bernal was part of this, as were his contemporaries Cornford, Caudwell, Guest, who bled to death on the fields of Spain, such was the intensity of their commitment to this vision. To understand Bernal it is essential to understand, even if it requires an immense imaginative leap, what it meant to be a communist, what it meant to have vision, a vision that was under attack, what it meant to take sides, what it meant to put your life on the line for the lives of others.

To reduce the whole communist movement, this movement of Bernal, Haldane, Caudwell, Guest, Gramsci, Bukharin, and many others whose names have faded from social memory, to Stalin and Lysenko is grotesquely unfair. To reduce this whole brave and brilliant historical experiment in socialism, to its failures, its tragedies, its betrayals might be the orthodoxy of our time, but it is not the truth, not the whole truth.

The marxist approach to science was seen by Bernal as still being in the process of being formulated. He thought that Marx, Engels, Lenin and Bukharin had only sketched the outlines of it and that it was being further developed particularly in the Soviet Union in a lively and sometimes violent process. He was aware of the main outlines of the Soviet debates and saw Soviet science as finding its philosophy in the very course of its revolutionary development. It was, he remarked, complicated at times by the fact that the older scientists were often hostile to new philosophical ideas, while the younger ones, who were most receptive, often lacked sufficient scientific knowledge. He knew of the clash between Vavilov and Lysenko, but did not seem to realise the gravity of what was taking place in this sphere, describing it as a difference in emphasis between hereditary and environmental factors, without articulating how these intellectual debates had become caught up in a complicated and deadly struggle for power.

Bernal himself was firmly committed to the science of genetics and was conducting experiments aimed at discerning the molecular structure of the gene. He was, on the whole, extraordinarily impressed by Soviet science and philosophy of science, at times more so than the situation warranted, always giving the USSR the benefit of the doubt. When he had first visited the Soviet Union in 1931, he was struck by the overriding sense of purpose there and found the country 'grim but great'. As time went on, Bernal discovered things that must have disturbed him deeply, particularly things relating to the fate of scientific colleagues in the Soviet Union. He interceded in response to the arrests of physicists, but in the atmosphere of the cold war, he did not criticise the USSR in public.

Lysenko is so often incanted, so little understood, so often cited against Bernal. There is nevertheless a vast literature on Lysenko and lysenkoism [18] situating it in its scientific and socio-historical context and analysing its complexities. I have contributed to it myself and I cannot do justice to its complexity here, but I want to assert that it is not enough to say that Lysenko was a charlatan, who did bad science, and Bernal should have said so. There was a real debate about the relative influence of heredity versus environment. There were the pressing needs of Soviet agriculture. There was real searching about what science should be under socialism. I understand his ambivalence, although I do believe that he could have

brought his considerable intelligence to bear upon it in a clearer and better way than he did and he could have brought his not inconsiderable influence to bear to shorten its span.

However, when it came to lysenkoism and stalinism, Bernal understood the many complexities and gave the benefit of whatever doubt he must have had to those he considered to be on the same side in an embattled world. That said, I still wonder. I especially wonder what he thought about the Moscow trials and the fate of Bukharin, who was such a crucial influence on him [19].

As did Bukharin, *Bernal looked at science under capitalism and under socialism with great knowledge and breadth of vision.* He believed that the frustration of science was an inescapable feature of the capitalist mode of production and that science could only achieve its full potential under a socialist social order. He saw science as breaking the bounds of capitalism, which could not contain a relentless search for truth and therefore generated a distrust of science.

Aspects of this argument seem outdated now, while other aspects are as relevant as ever. Certainly he underestimated how far the formidable system that is capitalism would come to incorporate science. It is no longer marginal or underfunded in the world we inhabit today. It is spectacularly otherwise. The linking of science with industry that he so strongly advocated has come to pass, but not in a way that he foresaw or would approve.

Gary Werskey, in a recent paper with many mentions of Bernal, written for the recent workshop at Princeton [20], quoted Pettijohn as saying that "*Bernalism has triumphed with capitalism*" [21] and Ravetz, considering Bernal to be a tragic figure in the history of science [22]. Werskey traced the incorporation of aspects of bernalism in a technocratic direction. He also highlighted the increasingly evident problems with the bernalist image of science as an inherently progressive force.

These problems are intensifying in the current climate, I believe. Looked at in a certain light, science is flourishing under capitalism, but examined more closely, it is also being constricted and even corrupted. The commercialisation of science, as part of the overall commodification of knowledge, with the endorsement and inducement of the state, is overtaking science today, not least here in Ireland. Scientific research is increasingly being shaped by market norms, even when it is funded by the public sector. This is profoundly problematic. Many scientists, as far as I can see, are either letting this momentum roll over them or even enthusiastically jumping aboard. One Irish physicist involved in university administration recently recommended commercialisation of research on the basis that it offered fun, fame and fortune. The inducements are many. Nevertheless, there is some disquiet, even if there seems to be little critique or resistance. At the very least, the problems arising should be discussed and debated.

We need contemporary scientists to take up the legacy of Bernal and his progressive contemporaries in examining the epistemological, ethical, social, political, cultural, economic dimensions of science and in challenging the prevailing orthodoxies and structures of power where necessary.

Bernal, known for his intellectual generosity and for his moral-political commitment to the communality of knowledge, stood for a fundamentally different ethos of science than that of many scientists today obsessed with their patents, promotions, prizes and pay (pushing for pay right off the public sector salary scales). Remarking on the many changes wrought by the

British research assessment exercise and the rising culture of intellectual property, confidentiality agreements, licences and litigation, Alan Mackay has observed : "The happy tea-time professional gossip of scientists has disappeared with fears that their patents may be compromised" [14].

While scientists are making their careers, many of them more and more distanced from philosophical reflection or social commitment, many in the humanities are becoming increasingly alienated and even hostile to science and scientists, partly because of a struggle for status and funding in academic institutions, but also because of a mutual intellectual incomprehension. The gap between the two cultures, so alien to Bernal, often seems to be widening. I am glad to see such initiatives as the projected Bernal Institute based at University of Limerick and a new Centre for Science in Society based at Dublin City University coming into the breach.

There is also increasing alienation and hostility to science in the wider society. There is distrust of the alliance of science and capital and a feeling of betrayal of the world's needs, as genes are patented and designer drugs for the syndromes of the rich take precedence over the diseases of the poor. Scientists need to address such apprehensions, both in scrutinising their own practice and in explaining themselves to the public.

There is also much misinterpretation of science, new-age mystification of science and an irrationalist backlash against science in the wider culture and sometimes even in universities. Scientists should argue back against these tendencies instead of being oblivious of them. Bernal entered into polemics against such currents in his own time, as did his contemporaries, especially when scientists themselves were bringing irrationality into science, and their arguments against Jeans and Eddington are relevant today to *The Tao of Physics* [24] and *What the bleep do we know?* [25] and the many manifestations of nonsense where sense should be.

I often thought of Bernal during the science wars of the 1990s [26]. I believed that the integral thinking that he and his contemporaries brought to bear on their times needed to be brought to bear on ours. I agreed with those who wanted to defend the cognitive capacity of science against epistemological irrationalism, mysticism, conventionalism, especially against anything goes postmodernism. I also agreed with those who insisted on a strong socio-historical account of science against a reassertion of scientism. A better grounding in what the marxist tradition has brought to bear on these issues would have illuminated the terrain.

Marxism has made the strongest claims of any intellectual tradition before or since about the socio-historical character of science, yet never doubted its cognitive achievements. The 1930s left believed that the left should take its stand with science. The 1960s left, my generation, was more suspicious of science, although I felt a greater affinity with the old left than did many of my contemporaries of the new left. The younger generation of today is more suspicious still.

In the tradition of Bernal, the left took its stand with science. I do not believe that the debunking of science in terms of its cognitive capacity or its social potential is an appropriate activity for the left. It is neither epistemologically sound nor politically progressive. The left should take its stand with science, a critically reconstructed, socially responsible science, but with all the higher possibilities of science. It should engage in a radical critique of the incorporation of science to global capital. It should open a path to the progressive potentialities

of science.

Science and science studies are thriving today in many ways, but they are lacking in philosophical vision and social commitment. There is much funding, many metrics, all sorts of empirical studies. However, many studies are narrow and shallow and driven by market demand and fast-track careerism rather than search for truth and public interest. Even many social studies of some associated gramme [21], are conceptualisation contextualisation.

Science studies small, too intro- nents esoterically cite each other and fail picked up a science cently and could not one would want to seemed obsessed micro-tendencies. weak evidence of rel- history and thin so- are no references to Caudwell, Bukharin, Lewontin, Wartofsky, ones to Marx and



Figure 2. Marx Engels Forum in Berlin 2006 (photo by HS)

Nevertheless, marxism has been a formative force in science studies, particularly through the work of Bernal, and it is a continuing influence, but it is not often acknowledged. It is sometimes "the philosophy that dare not speak its name" [29]. Since the rise of the new right in the west and the collapse of socialist experiments in the east, marxism has become heresy again. Moreover, many of its premises have come to be so accepted that it seems no longer necessary or opportune to say from where they have come. It is not only dare not or need not, but know not. Many younger academics have only a weak knowledge of the history of their disciplines or the history of much else. They do not know that many of their premises come from marxism. There are a number of books in science studies today that do not even mention Bernal or Haldane or Bukharin or Hessen, but assume premises for which they argued, although it is sometimes in a confused or enfeebled form.

Marxism lives on, but in circuitous and complex ways, sometimes in strong, brilliant, defiant ways, but sometimes too in weak, confused and debased ways. It is often marxism lite as an element of intellectual history lite to be raided for random insights for theory lite. Sociology of knowledge must be brought to bear upon trends in sociology of knowledge, including sociology of knowledge lite.

However, the overriding point for me is that marxism still makes more sense of science and all else than anything else I see around me. It has come down in the world, but it is still there and still needed.

science, including with the strong pro- too weak in and too random in have become too verted. Its expo- themselves and to look wider. I studies reader re- imagine why any- read it [28]. It with minidebates of There was only evant intellectual cial context. There Bernal, Haldane, Hessen, Levins, Hörz and only trivial Engels.

So where have all the marxists gone? Some of us are still there, struggling on, sadder but wiser. I only wish there were as many as David Horowitz seems to think [30]. Others are still there, but quieter. It does not come screaming off their cvs or web profiles as it does on mine, but it informs their work in many ways. Others are quasi-marxists or post-marxists. They have become discouraged by defeat or decentred by postmodernism. It was one thing when the wind was at their backs, but they have been swept off their feet by crosswinds they could not withstand. Then there are the ex-marxists. Some of them go witch-hunting and draw up lists. Horowitz and other neo-conservatives are doing their best to stir up fear and resentment and to clear out whatever marxists and fellow travellers are left in US universities.

Universities are being harnessed to operate by market norms and survival of the fittest, in commercial competition, in outstripping all other forms of validation, particularly truth criteria, theoretical depth and breadth, moral responsibility, political engagement. There are powerful pressures disincentivising, eroding, marginalising critical thinking, creative thinking, systemic thinking, especially systemic thinking. There has never been such a totalising systematising force as contemporary global capitalism and yet never has there been such inhibition of totalising systemic thinking. This is a great paradox of our times.

The centralising market decentres the psyche. It organises consumption, but disorganises community. It can meet the demands of some for luxury homes, suvs and tivos, while it does not meet the most basic needs of others. Millions live in shacks made of rubbish without electricity or running water or basic health care. The market cannot meet the need for meaning or community for anyone. There is a seeking of truth, a striving for justice, that the system cannot fully repress. In this I place my hope in a revival of the kind of totalising thinking and collective acting that marxism has nurtured through the decades. Science is crucial to this.

The core of the legacy of Bernal, what is most relevant for our times, is the thrust to totalising and synthesising thinking. The qualities embodied by J D Bernal are precisely those missing in our universities and in our world today : synthesising vision and communal commitment. His enduring bequest is his vision of science as inextricably tied to philosophy and to politics. Such integrality is lacking in many contemporary debates on science and its relationship to philosophical assumptions and social structures.

It is important that the real and controversial contribution of Bernal be assessed by scientists today. He has much more to offer than a sense of Irish pride in a local lad who strode the world stage. The point is what he said and did while striding there and what we might learn from it even today.

So, in conclusion, it is not despite the fact that he was "as red as the flames of hell" [31], but because of it, that I think that we should honour him today.

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The I.Q. Myth

Walter S. Neff

The magic letters "I.Q." have become almost as familiar to the American public as C.O.D. or B.V.D. This doubtful result is in great part due to radio, which somehow discovered that quiz programs were an efficient means of selling soap and laxatives. Public interest in I.Q. has also been stimulated by the fact that in two great wars the government administered to millions in the armed forces a kind of "mental test." By this time, moreover, probably millions of school children have been subjected to one or another variety of "intelligence" test. It would be hard to find another, supposedly scientific, subject in which the mass of the population shows as much interest. Unfortunately, it would also be hard to find a subject which has suffered from such harmful distortions as the apparently innocent matter of intelligence testing.

Particularly sinister has been the attempt to use the alleged results of intelligence testing as props for the idea that social or so-called racial groups differ in native ability. The findings of half a dozen sciences during the past generation had forced this particular fallacy back into the nether-world of avowed bigots. But the movement seems to have been only a strategic retreat and not a rout. Now, with the heightening of reaction's drive, this racist myth is reappearing, with academic sugar-coating, in "learned" journals.

For example, consider a recent article by Professor Garrett, executive head of the department of psychology at Columbia University, "Negro White Differences in Mental Ability in the United States" (*Scientific Monthly*, October, 1947). The professor begins with a great display of objectivity. "The honest psychologist," he writes, "like any other true scientist, has no racial bias; he does not care which race (if any) is more intelligent." But still he concludes that "on tests of mental ability, American Negroes on the average rank consistently lower than American whites."

As is typical of this school of thought, this particular "honest psychologist" achieves his result by carefully selecting his evidence from a few old studies whose findings have been thoroughly discredited by more recent research. In addition, and this is of even more basic significance, he seems to accept uncritically the idea that standard intelligence tests afford a fair measure of innate endowment. It is with this widespread and dangerous notion that I will deal.

About forty years ago the Minister of Public Instruction in France assigned two colleagues, Binet and Simon, the task of devising an instrument which would measure the "native ability"

of children. The problem at that time was clear-cut. The idea was to find some way of distinguishing between those children who were doing poorly in school because they were really dull-witted, and those who were doing poor work for a variety of reasons extraneous to their "real" ability. In the course of their efforts to solve this problem, which has turned out to be more complex the more it has been investigated, these two French educators hit upon a novel approach which, with refinements, is still the basic methodology of mental testing today.

Being eminently practical men, Binet and Simon started with what they already knew. They shared the general experience of all teachers that, as children grow older, they are able to grasp more and solve more difficult problems than when they are younger. It is upon this very obvious fact that the entire system of graded classes is built in any modern educational system. Thus, Assumption I of the method is that mental ability *develops* as the child grows. Another familiar observation - that children of the same age appear to differ in mental development - leads to Assumption II : that mental ability develops at different *rates* and reaches different levels in different individuals.

It is with these two quite practical ideas that Binet and Simon set to work. Their method was empirical from the beginning. They obtained access to a number of school children of differing ages. They then set up a whole collection of tests of a wide variety of apparently unrelated abilities: ability to repeat numbers, to solve problems, to identify pictures or words, to get the point of stories, and so on. Now here is the chief novelty of their method. Those problems which appeared to differentiate the entire group of children according to their age were considered crucial, and those which did not do so were discarded. In other words, if a given problem was solved by most eight-year-olds, for example, but was too difficult for the six-year-olds and too easy for the ten-year-olds, then Binet and Simon concluded they had a fair measure of average mental ability as displayed by eight-year-old children. From this procedure came their basic notion of mental age, which is the building block of all tests of mental ability among children.

And from this procedure also came their "intelligence test," which is nothing more than a battery of such age-placed subtests worked out for different age groups. As the test was later used in practice, a child of a given age who passes test problems characteristic of the older children in the original sample was considered "superior" in intelligence; if his performance was about the same as the children of his own age in the original sample, he was considered average; if he could pass only those problems which children younger than he in the original sample could solve, he was considered "inferior" or "retarded." Later investigators, particularly an American, Louis M. Terman, devised the numerical concept of the intelligence quotient (I.Q.), which is simply the child's mental age score on the test divided by his actual chronological age. Thus, by simple division, a ten-year-old child who gets a mental age of eight years, would have an I.Q. of 0.80 (written usually as 80); if the same child got a mental age score of twelve years, his I.Q. is 120; obviously an exactly average child will have an I.Q. of 100.

An Intelligence test score is thus a highly *relative* thing. *Interpretation of a given score on a test made up in this manner can have meaning only with reference to the characteristics of the original group on which the test was standardized.* In other words, if little Willie, to whom we give the test today, gets a mental age score of ten years, this simply says that his performance is about the same as that of the actual ten-year-olds used in the original standardization group. But what factors determined the ability of the original ten-year-olds? Here we

reach an impasse! We come out precisely where we entered.

This whole problem of mental testing reminds one of the old riddle of how to lift oneself by one's, bootstraps. In constructing the tests, the psychologists wanted to find some way to measure "native ability" unaffected by social and environmental factors. Yet the human material used to standardize the tests was composed of people drawn from society as it exists, whose behavior is, of course, already a product of an unknown combination of biological and social factors. Thus, the entire procedure involves itself in a vicious circle.

If the psychologist could provide himself with a standardization group of children reared in an environment exactly identical for each, the differences which then make their appearance could be attributed to differences in inborn ability. But such has not been, and is hardly likely to be, the case. On the contrary, the crucial group of children — the standardization group with which all other children are to be compared — is already sharply differentiated by whatever social and environmental factors have been brought to bear upon them since birth, so it is impossible to judge whether the final result is due to biological factors, social factors or some combination of both.

The standard intelligence tests have generally attempted to use as the "norm" the child of "average social status." In his 1916 adaptation of the Binet-type test — widely known as the Stanford Binet — Terman apparently made an effort to secure a large number of children of middle status. He tells us that "the schools selected for the tests were such as almost anyone would classify as middle-class." In addition, no children in his sample were foreign-born, few were other than western European in descent, and all were white. On the basis of 500 children, whose social status was estimated in each case by their teacher, we find that those of "average" social status obtained an average I.Q. of 99.5, near enough 100 to be considered perfectly at norm.

In his latest revision (1937), Terman made a fairly successful effort to gather a standardization sample which was really representative of all the social levels in our society, but here again the results tell us only of how the children performed at the time of construction of the test and yield no information upon the cases of the relationships found. Kuhlmann's adaptation of the Binet, used in a widely quoted study of the relation between social status and intelligence, was built on subjects from county fairs, orphan homes and public schools, and we cannot even guess at their social background.

Precise knowledge of the individuals making up the standardization sample is decisive for a scientific interpretation of an intelligence test score. It is all the more serious, therefore, that very broad generalizations have frequently been made in the field of mental testing without taking this basic fact into consideration. Not very long ago, psychologists were using tests standardized on middle-class, native-born, American white children to measure the "native ability" of groups as diverse in culture and background as south European and Mexican immigrants, American Indians and American Negroes. When these groups obtained lower average scores than native-born American whites, investigators jumped to hasty conclusions on the relative superiority and inferiority of different racial and national groups.

In the field of "racial intelligence," Otto Klineberg of Columbia University, among others, has shown why these conclusions were hasty, to say the least; and most psychologists are now agreed that a test standardized on one racial or national group cannot be applied to a group of sharply differing culture and background. Very interesting recent evidence of the fact

that, under similar environmental conditions, American Negroes learn just as efficiently as American whites, is afforded by the results of the Army literacy-training program carried on during World War II. Summarizing these results, Herbert Aptheker demonstrated that "the learning accomplishments of scores of thousands of Negroes from all sections of the country ... compares quite favorably with that attained by scores of thousands of similarly diversified whites." (*Journal of Negro Education*, Fall, 1946.)

The core of the problem is that most intelligence tests measure education and information to a considerable extent on the implicit assumption that the more intelligent an individual is the more knowledge and skill he will be able to absorb or acquire. This has a certain appearance of truth, but the assumption becomes invalid in our society had precisely equal opportunity, encouragement and stimulation to acquire education and intellectual ability, and if the fund of things to be learned were common to all, then intelligence test performance might be a fairly accurate measure of native ability. But we know that social and economic factors (in a class society such as ours with a complex division of labour) have a great deal to do with opportunity for education, cultural stimulation and intellectual attitude.

It should not surprise anyone, then, that a very large number of studies of the problem have demonstrated that social status and intelligence test performance are clearly related. Wherever samples have been taken, it is easy to show that the children of unskilled, low-paid workers score, *on the average*, about twenty points lower in I.Q. than do the children of professionals and business executives. Similarly, rural children average lower than city children, and country children from the more backward areas show still lower average scores.

In the early days of intelligence testing, these results led to the comfortable generalizations that, after all, one's economic and social position in a "free" society such as ours is determined by one's native ability. It is instructive to see these supposedly objective scientists parroting the complacent opinions of the well-to-do, that the poor may be honest, but not very bright. It took the economic crash of 1929 and its widespread social effects to launch a sharp controversy among psychologists about these results, which led to an interesting series of studies during the Thirties on the relation between social status and intelligence. One of the best studies of this type showed that children of common laborers, who are adopted at infancy by professional foster parents, demonstrate intelligence levels, when later tested, just about the same as the real children of professional parents. Here is evidence that the twenty-point I.Q. difference mentioned above between children of the lowest and highest economic categories in our society may be attributed entirely to environmental factors.

Similarly, M.E. Shimberg demonstrated that a test standardized on a group of rural children (rather than on city children as is usually the case) resulted in lower scores for *city* children, a result which is the reverse of that obtained with the standard intelligence tests. Finally, Beth Wellman is one of a number of investigators who have shown that special educational techniques can bring about significant increases in I.Q., provided that these techniques are applied to young children who are otherwise normal. It is important now to recognize that the net effect of these studies — of foster children, identical and fraternal twins, and so on — have led most in the field to the conclusion that social and environmental factors play a very considerable role in determining intelligence test performance and that, in fact, differences in average I.Q. related to social status are not a decisive indicator of original differences in native endowment. My own survey of the evidence in this field led me ten years ago to the unrefuted conclusion

that "these tests cannot be used for measuring the capacity of different social levels within our own society."

Thus, the degree to which the best intelligence tests measure innate ability has become an extremely debatable matter and the more cautious investigators have become accustomed to leaving this crucial question entirely open. Actually, this should have been clear from examination of the very structure and make-up of the so-called standard intelligence tests, and we must conclude that it was only class bias (conscious or unconscious) that prevented psychologists from seeing this point earlier. Once we remember how the test is constructed, we see that all that is measured here is the average performance of the "standardization group," which thereafter functions as the level below or above which inferiority or superiority is to be fixed.

Even if one takes pains to bring together a standardization group which really represents a cross-section of society (a feat never really achieved by anyone), it is still not clear what the results will imply. If our earlier statements as to the relation between social status and cultural background are true – and they are supported by facts which cannot be argued away – then the standardization group *itself* will already be affected by social influences as regards its proficiency at various tasks, a result which will be permanently self-perpetuating as soon as the test is applied in practice.

It must be emphasized that we are not saying here that *individuals* do not differ in ability. We are saying that it is impossible to determine the *reasons* for these differences by the use of intelligence tests. Individuals may differ exclusively because of environmental influences; they may differ because of some combination of biological and social factors; few think that the differences can ever be attributed purely to hereditary factors. But the very method of construction of the standard intelligence test, combined with the existing wide variation in social and cultural opportunity, makes it impossible to derive any positive conclusion whatever even as to individuals from intelligence test results.

Like all myths that have a survival value for the ruling class, that of racial, national or social superiority dies hard. Only when the exploitation of man by man becomes a thing of the past will the study of human differences become a truly objective affair. **P A S**

Dr. Dhirendranath Gangopadhyay Memorial Lecture 2008

Venue : Bangla Academi Conference Hall, Kolkata

Time : 5 p.m. to 9 p.m. on 16.12.08

Speaker : Dr. Soumitra Sengupta

(Theoretical Professor Indian Institute of Cultivation of Science, Kolkata)

Subject : Modern Science in search for Unification

The Philosophy of Freud

J. B. Furst

Many people insist that the only way to judge Freudianism is by analysis of its clinical or psychiatric results. They object to a philosophical analysis as too abstract. Freud himself regarded philosophy as beyond the boundaries of psychoanalysis and he denied that he was elaborating any kind of world view. He was simply a scientist, he stated, endeavoring to study the workings of the mind.

The fact is that any science worthy of the name must have a definite methodology of thought in addition to certain premises about the nature and organization of reality. An examination of Freudianism reveals a definite mode of thought and many assumptions about the nature of man, the nature and movement of society and the relationship of man to society.

In this paper we propose to examine this philosophy and the social-historical forces which shaped it and to investigate the extent to which the present Freudian psychoanalytic movement in the United States follows the original teachings of Freud.

Freud was a physician and a neurologist. He began publishing psychiatric papers in the early 1890's, but his formative scientific training occurred from then to fifteen years earlier, around 1870 to 1875. These dates clearly place Freud in the great efflorescence of bourgeois science which occurred in the nineteenth century.

Starting with the discovery of the cell by Schleiden and Schwann in the 1830's, biology had made extremely rapid advances. Darwin's *Origin of Species* was published in 1859. Scientific history, economics, political economy, anthropology, sociology, etc., were being elaborated for the first time in human experience. The publication of Morgan's great work, *Systems of Consanguinity and Affinity of the Human Family* in 1869 marked the beginning of scientific anthropology. Wundt initiated the science of experimental psychology in the 1870's.

By Freud's day the bourgeois world had already clearly failed to make good the glittering promises of equality, justice and freedom which had been advanced at the time of the great democratic revolutions. There was already a definite tinge of pessimism, retrenchment and growing cynicism. Furthermore, the capitalist world was rent regularly by recurring depressions which the bourgeoisie did not understand, could not predict or control, and which seemed to drop like bolts from the blue. The labor movement was gaining in force, organization and consciousness. Already Marxism was making its impact; the ominous specter of socialism had raised its head and the bourgeoisie had drowned the Paris Commune in blood. Laissez-faire capitalism was becoming monopoly imperialism. Struggles between the capitalists were sharper, and the race was on for re-division of the colonial areas. Already by the middle eighties a titanic world war was in the air and was clearly foreseen by Engels.

These developing social conditions and contradictions had their ideological reflections in many different fields of creative activity. A new rash of transcendental, mystical and idealist philosophies arose in defense of capitalism. Schopenhauer exuded gloom, pessimism and a violent form of cynicism and male supremacy. Nietzsche emphasized irrationality, force and power, the superman and the lowliness of women. Wagner wrote operas whose themes empha-

sized violence and irrational scheming ending in overwhelming disaster – the Twilight of the Gods.

These world conditions were reflected in and helped to shape Freudian theory. The general irrationality of bourgeois like and the bourgeois inability to understand the forces of their own society undoubtedly influenced Freud in his decisions that the unconscious-irrational part of personality holds a preponderance over rational consciousness. In Freud's diagram of personality, the unconscious and its asocial forces occupy two-thirds or more of the mind. Freud regarded the instinctual forces as hidden, irrational and extremely powerful; he said so, on many occasions. He also postulated a death instinct, ceaselessly leading people to violent acts, to aggression, sadism, murder, suicide, wars, hatred, etc..

Freud undoubtedly did see some of these characteristics in his patients and in himself, but where else could these things have come from but from the main currents of the times? Freud was actually describing personality reflections of the same violent, bloody and apparently irrational social forces which were finding other expressions in Wagner's music and Nietzsche's philosophy. In order to escape the conclusion that a change in society was possible and necessary, a well-defined current emphasizing irrationality took root in the nineteenth century, long before this was carried to its logical conclusion by the Nazis. Freud was no Nazi and lived eventually to be persecuted by them, but his theories of the preponderance of unconscious forces represented the developing currents of anti-intellectualism. He even invented an unconscious racial memory.* He did not elaborate on this, but the idea was taken up and expanded by his pupil, the pro-Nazi, Carl Jung.

When thus placed in its historical context, Freudianism can be understood not simply as the contribution of one man, but as the specific form in which the developing science of the bourgeoisie took shape when applied to the psychology of personality. This bourgeois origin is further emphasized by Freud's middle-class position and the fact that his patients were mostly from the wealthy classes.

An extremely useful key to certain sides of Freud's work lies in the fact that he gave a scientific-seeming expression to all the common hopes, beliefs and lies of the bourgeoisie about society and human nature. ** For example, women in the capitalist world occupy an inferior position to men legally, morally, politically, in family life and in industry. They are also correspondingly regarded in common bourgeois ideology as mentally and spiritually inferior; masculine supremacist attitudes dominate every aspect of capitalist life and propaganda. We can find a close parallel to this estimate of women in Freud, although it is couched in psychoanalytic terms instead of vulgar language. He regards them as biologically inferior to men because they do not possess a penis, and therefore are doomed all their lives to envy men. Because of this lack, women do not develop beyond the Oedipus Complex as completely as men, and therefore, according to Freud, women remain self-centered, narcissistic (self-loving) and unable to love as strongly as men. They also do not develop creative powers save those already located in the womb, nor do they develop the superior spiritual and moral powers which men attain by virtue of their possession of the male organ. By a complex system of argumentation involving sex,

* Freud : "Fresh Material from the Primal Period," Collected Papers, III, p. 568.

** "Never before in any of my previous writings have I had the feeling so strongly as I have now that what I am describing is common knowledge, that I am requisitioning paper and ink, and in due course the labor of compositors and printers, in order to expound things that in themselves are obvious." Freud : Civilization and its Discontents, p. 94. In this chapter, Freud is discussing the origin and history of his theories that instincts govern personality.

castration, instincts, and the presence or absence of a penis, Freud finally reaches the common bourgeois conclusion that women are inferior beings.

Helene Deutsch, in *The Psychology of Women*, has pushed these arguments to their logical conclusion. According to her, women are passive, masochistic and narcissistic in their essential nature. Thus we see that Freudian psychoanalysis repeats with a vengeance the most reactionary bourgeois formulations on women; furthermore, it adds ideological justification for their exploited and oppressed condition in capitalist society.

Bourgeois ideology in defense against a changing world maintains that the capitalist system is natural, eternal and changeless. Freud reached identical conclusions. Through his theories of the instincts he regarded human beings in all ages and under all forms of social organizations as essentially the same.* For example, he maintained that the essential psychological conditions of the Oedipus Complex pertain in all different kinds of society throughout all ages. He theorized that human beings, their activity and their psychology, are the products of inherited, instinctual drives and feelings. These instincts, the Sex or Life instinct and the Death instinct, change very slowly over periods of hundreds of thousands of years; they are rooted in biology and do not change faster than man's biological organization. Thus, for all practical purposes, human nature is not essentially changeable. Nor is human society changeable, for Freud postulated that the form and conditions of bourgeois society are also determined by these Life and Death instincts.

Freud's instinct theories are the heart of his system of thought; they determine the forms of individual development, the forms of family organization, of social relationships, etc.. Yet all instinct theories of human motivation, human feelings and human behavior have been thoroughly criticized rejected by many authors.* Scientific, experimental, historical and anthropological evidence fails to justify any belief that instincts rule human nature. On the contrary, there is much evidence to show that human psychology is extremely plastic and takes many forms, depending on the class and productive relationships of the particular society which produces and particular person. Such conclusions also bear out certain main tenets of dialectical materialism, namely : that all processes are moving and changing continually; that a static view of life is false and that thought-forms and ideology are secondary to and derived from the material facts of existence.

Human beings undoubtedly have inherited biological needs for food, water, shelter, sleep, sexual activity. But whether these inherited needs are fulfilled or not, the manner in which they are fulfilled, and what people think and feel about them is not determined by biology itself but by the surrounding social organization. For example, sex is a biological need, but whether it is regarded with common-sense attitudes or with secrecy and mystery, whether it is practiced not at all, or with pleasure or with loathing, whether it is utilized to express affection, exploitation, anxiety or other needs is all determined by the relationships pertaining in a particular society and not by inherited instincts or sex itself. There is no valid scientific evidence which shows that biological sexual differentiation of itself creates any temperamental or personality differences between men and women.

In defense of individualism, "free enterprise" and laissez-faire, the bourgeois world main-

* Freud : "Instincts and their Vicissitudes," Collected Papers, IV, p. 60.

* Marmor : "The Role of Instinct in Human Behavior," Psychiatry, Vol. 5, p. 509; Klineberg: Social Psychology, Chapters 4-8 inclusive.

tains that human beings are naturally and inherently selfish and self-centered. Freud reached these very conclusions by several different routes, some examples of which follow.

First of all, he elaborated the pleasure-pain principle, a hedonistic theory which states that we act so as to gain pleasure and avoid pain. By his pleasure-pain principle, even an unselfish or altruistic act can only be done if one gets pleasure from it, and would be avoided if it were painful. The possibility is ruled out that one can see the social necessity for an act and perform it without subjective gratification or pleasure.

Secondly, Freud buttressed the theory that humans are inherently selfish through his doctrine of the sublimation of instincts. According to this theory, the early psychic life of the child is dictated by the development of his sexual and death instincts. As the child matures into an adult, these instinctual urges do not disappear; they simply change their outward aim and form, that is, they take a sublimated expression. Thus, in Freudian theory a surgeon is likely to be a sublimated sadist; an astronomer who peers through telescopes is sublimating desires to look at genitalia and intercourse; a politician of whatever conviction is sublimating drives of oral sexuality, and a gynecologist or proctologist would be sublimating drives of an anal-sadistic nature. Further, a Communist can easily be explained as expressing a sublimated sadism, latent homosexuality, or infantile revolt against parental authority, etc.. Last summer, for example, at the International Mental Hygiene Conference held in London, Dr. Ernest Jones, a leading British psychoanalyst, stated that the Russian people suffer from a mass guilt complex and anxiety because they murdered their little father — the Czar!

Under such a system of thought, the motivation for any human act is reduced ultimately to the sublimated expression of a biological instinct which at bottom is thoroughly un-social, primitive and selfish in nature. It is no wonder then, that an occasional person analyzed by a strict and doctrinaire Freudian loses all faith in any possibility of human decency. He comes to the conclusion that he himself is selfish and everybody else is too, so he might as well "express himself" and get what he can while the getting is good.

Let us turn from the common bourgeois ideology which to a brief consideration of his scientific method. First of all, it is important to emphasize that it was a scientific method, that is, Freud made observations of case material and attempted to interpret them in a rational manner. This method enabled Freud to postulate that psychological phenomena are not spiritual or other-worldly, but that they are natural phenomena and therefore occur according to strict and discoverable laws.

This is the basic principle of Psychological Determination and it constituted a major advance which underlies any progress whatsoever in the understanding of human personality. It is obvious that personality cannot be comprehended if it obeys no laws and is determined by caprice or chance, as had been assumed before Freud's day. This deterministic principle is perhaps Freud's greatest contribution to psychological science.

Freud's scientific approach, characteristic of his day, was marked by a mechanical materialism fails to allow for or comprehend the fact that real changes occur in the processes of reality. In Freudian theory, the adult is regarded not as *qualitatively different* from a child, but as being simply an enlarged child, a being who repeats in adult life the stages to which he had developed by the age of six or so in his Oedipus and Castration complexes. Therefore, in describing adult neurotic behavior, Freudians repeatedly refer to it as "infantile." The child

or infant is a product of his instincts, and these do not change except over periods of hundreds of thousand of years. So for all practical purposes, nothing changes; neither instincts, children, adults, nor society itself, for we must remember that Freud postulated over and over that society also is built and determined by man's instincts. Here, then, is the essence of that static viewpoint which lay inherent in vulgar materialism.

Some have made the claim that Freud is a dialectician because he advanced the idea that conflicts are the source of neurosis. But Freud's conflicts are not interpenetrating and dialectical; they are static conflicts. The demands of the unchanging instincts are opposed by the needs of an unchanging society. This is a conflict which has no movement nor development, and is furthermore a mechanical confrontation of two opposing forces, rather than a dialectical unity and interpenetration of contradictions.

A direct result of the mechanical mode of thought is that explanations are given which are too simplified, which do not fit the marvelous complexity of psychological processes. One of the major criticisms of Freudian theory is that it is too simple. All peoples under all governments in all ages are assumed to be the same. This in itself is a vast over-simplification. In addition, the psychology of people is determined by only two instincts, and one finds that every person undergoes the same simple progression of pre-genital sexuality and then becomes enmeshed in the Oedipus and Castration complexes. One knows in advance what one must look for in every neurotic of every type, i.e., a sexual fixation.

Freud gave further instance of his mechanical approach when he drew his famous map of the mind and divided up the personality into the Ego, the Super-Ego, and the Id. In actual practice, this amounts to a mechanical separation of the mind into three separate little personalities. These personalities punish one another, ally with one another against the third, spy on one another, restrain each other, play tricks, seduce and deceive one another much in the same manner as the normal diplomatic relations which exist between capitalist states.

We find, then, that Freud's scientific method had qualities which have become characteristic of bourgeois science generally: it led into idealism; it lent itself to reactionary conclusions and to an ideological defense of the existing order.

The fact that Freud had no concept of social man has already been demonstrated by Francis Bartlett and others. Freud conceived of man as isolated man, and his conception of society was that of an aggregate of isolated persons having basically an animal nature which might be covered over by a thin veneer of civilization but which remained essentially unchanged by social living and would immediately reveal its ugly, animalistic nature under stress of war, privation, or severe need. Freud's conception of social man is actually identical with that of a herd of cows or other animals which persist together in a group but basically do not influence each other very much, each essentially going his separate way.

The present-day applications of Freudianism may be illustrated by examining the last four issues of a leading American Freudian journal, the *Psychoanalytic Quarterly*.*

Nineteen of the twenty-seven articles quote Freud directly or list his writings as references. In no case does any one of these twenty seven articles take issue with any basic Freudian principles. Discussions of or references to the instinct theories, the Oedipus complex, the theories of pregenital sexuality, the Oedipal fixations, the Castration complex and such doc-

* V.17, Nos. 3 and 4; V. 18, Nos. 1 and 2.

trines as identification, symbolic gratification, sublimation, etc., are adduced in every article as the causes of the neurotic personality or social phenomena under examination. The twenty-seven articles present case material of a sexual nature, theories of illness, and articles on society, history, art, literature, murder, mythology, Shakespeare, the origin of clothing, the nature of reality and comments on dream analysis. One notes an absence of discussion on neurotic cases which do not show pronouncedly sexual symptomatology.

In essence, these articles are confined to illustrating, polishing or further extending Freud's original concepts. One article gave further comments and discussion on a case of paranoia discussed by Freud over thirty years ago. Indeed, although these papers follow Freudian thinking, in one sense a degeneration seems to have occurred; they lack the clarity and the observation of new facts that one notes in Freud's early papers. These papers seem less concerned than Freud was with the actual details of the patient's life and more concerned with the tracing out of an already agreed-upon ideology.

Beside illustrating neatly and repetitiously the extreme Freudian emphasis on the early childhood experiences and the past or present sex life of the individual, these twenty-seven articles also largely disregard present environmental circumstances of the patient unless they involve sexual conflict, sexual jealousy or other elements of an openly sexual nature. The doctor-patient relationship (the "transference") is also expressed continually in terms of sexually-oriented, parent-child relationships, with the patient transferring to the doctor sexual fixations which he had toward his parents in childhood.

The general emphasis on sexuality may be illustrated by the following summary passage of an article on paranoia:

"Excerpts from the analysis of a non-psychotic patient who had fantasies of persecution, confirm the observation of others that the persecutor may be unconsciously equated with the subject's feces in the rectum. Tormenting anal sensations are projected to the homosexual object in the external world, and transformed into feelings of persecution. The correlation of constipation and feelings of persecution with the analysis of the transference relationship leads to the belief that in this instance there occurred an unconscious form of anal masturbation in which the fecal mass arouses sensations in the subject's rectum [the patient's, J.B.F.] in response to masochistic feminine fantasies. The fecal mass also represented the homosexual object's penis [the analyst's, J.B.F.], and in a fantasy of pregnancy, the unborn baby. The material offers the technical suggestion that the analyst be alert to detect references or associations to anal sensations whenever patients in analysis are preoccupied with fantasies of persecution or assault."

Another article states that when the word "reality" occurs in free associations, it refers not to the external world but to female genitalia, and the word "illusion" refers to the imaginary or illusory penis. The author further suggests that unconscious associations of this sort may have affected philosophers' ideas on the nature of reality.

One article on "The Passing of the Gentleman" denies class struggle in England, defining the upper-class code and ethics as representing the "super-ego" of the English nation, and ascribing the violence of the conflict between Left and Right in England as being due to the true meaning of the word Left, namely, to castrate! Another author discusses the origin of clothing and describes clothing as being a magic and symbolic way for an adult to obtain the type of protection he had formerly enjoyed while in his mother's uterus.

There is a paper which describes a new entity, an unknowable "Erlebnis." This is defined as a direct inner experience, and one that cannot be described or analyzed any further. After postulating this new psychoanalytic *ding-an-sich*, the author names as examples of *erlebnisse*: one's own ego, anxiety, freedom of the will, all kinds of creative inspiration and masculinity and femininity. Thus, these entities are effectively removed from the domain of rational inquiry and must remain forever incomprehensible to us.

Another paper states that our present social problems, including the cold war, are due to destructive, anti-human impulses which are "expressions of a disordered infantilism." Present world problems are not due to class struggles, social or economic factors, but are caused by the fact that parents give children faulty emotional up-bringing. Therefore, the solution to the ills of society is found "through preventing hostility in childhood."

Finally, an article by Pederson Krag on "Detective Stories and the Primal Scene" asserts that people read detective and mystery stories because they are in reality gratifying hidden impulses to watch their own parents having intercourse.

In short, we may conclude from a study of the current journals that the teachings of Freud are very much alive and that they are the inspiration and guide of the official, Freudian psychoanalytic societies in America. It cannot be dismissed as accidental that in only four recent issues of this Freudian journal one can find illustrated every type of error, myth and absurdity previously pointed out in Freud's work by materialist scholars.

The defenders of Freud and Freudian psychoanalysis point to his great contributions, for example, the concept of transference, *i.e.*, the neurotic aspects of the patient's relationship to his analyst. Now it is true that the concept of transference contains the germs of a very great idea, but in discussing the concrete tendencies and effects of *Freudianism in practice*, we cannot separate the basic concepts of transference from the specific forms in which Freud developed them. The Freudians certainly make no such separation. They use transference as it was developed by Freud, namely, as a sexually-oriented relationship in which the patient reacts to the doctor in the same way he reacted to his parents during his Oedipus complex. Thus, the practical, day-to-day usage of the transference concepts by the Freudians involves the instinct theories of sexuality, the Oedipus and Castration complexes, etc..

In defense of Freud it is argued that he made many great observations which confirm his theories. To this, the materialist would answer that an observation is not a simple "fact." We do not observe things passively; an observation results from the active participation of the observer; it is the product of the observer's interpretation and molding of the data presented to his sense organs. The observer's previous tendencies, beliefs and experience will of course determine his interpretation of given sensory data.

Furthermore, the observer's historically-conditioned tendencies can lead him to set up experiments or circumstances in such a way that certain data will be presented and others will be excluded. For example, spiritualists investigating human behavior will obviously conduct their experiments in such a way that many phenomena will be ruled out by their very mode of investigation. Present Freudian theory ipso facto rules out certain realities ... *for example, the non-sexual causation of nervous illness.*

In discussing psychoanalytic observations of what specific patients said or did in analysis, it is also necessary to point out that under the influence of his particular theories, the analyst

always makes a definite choice of that material which he considers most important. A doctor practicing with classical Freudian theory will see specific isolated things in his patient while a doctor who uses Jungian theory or Horneyian theory, sees other specific things again in isolation from the person's total make-up and experience. Patients soon learn the trend of the analysis and will concentrate their attention on what seems important.

This influence of the analyst on the patient extends not only to what the patient says or does in the analytic hour, but even to the dream material. I have had two patients who came to me after having had extensive Freudian and some Jungian analysis previously, and it was interesting to note in retrospect the changes which occurred in their dreams as they were in the different types of analysis. During Freudian analysis, there were many dreams which had included snakes, lizards, long objects and other things which could be interpreted as penises. During the periods of Jungian analysis, there were dreams of interlocking triangles and circles, symbols which are important in Jungian theory. During the analysis with me, the dream material again changed after many months to the symbols which characteristically appear in my work with patients!

One cannot be eclectic about Freudianism; one cannot reject the instinct theory while accepting wholeheartedly the Oedipus complex, transference, or any other of Freud's concepts. Nor can one defend Freudianism in its daily practice by referring to the germs of great ideas in his concepts. One cannot separate in practice the form from the basic content of these ideas. It would be like defending Kantianism by claiming that Kant was perfectly right in maintaining that things should be classified in categories. This may be so, but does that justify us or anybody else in following the Kantian categories?

Defenders of Freudian psychoanalysis point out that considerable development has occurred in Freudianism itself and that unanimity of opinion does not exist among Freudians. This is true, although one might doubt it from reading the *Psychoanalytic Quarterly*. It must be emphasized, however, that there is an official psychoanalytic movement which follows Freudian principles definitely and rigidly.

It has been further pointed out in defense of Freud that he himself did not insist on his instinct theories, that he constantly changed them and regarded them as the Meta-psychology of psychoanalysis. This also is true, but in the daily practice and teachings of the Freudians, these instinct theories are not used in any metaphysical way. On the contrary, these theories influence Freudian teaching, Freudian therapy and Freudian speculations on the nature of man and society in very concrete and demonstrable ways. *Theoretically*, the instinct theories may be regarded by Freudians as not finally proven, but *practically*, these theories determine the daily usage of the Freudian psychoanalysis. Therefore, we are correct in carrying on a rigorous polemical battle against these "metaphysical" theories and their very substantial, very un-metaphysical results.

Freudianism, then, is best understood as the historic form of bourgeois science when applied to personality. Freud's original theories are very much alive today; they remain a formidable opponent of dialectical materialism. It is necessary that the grains of truth in Freudian theory be completely reworked from a materialist basis. What will emerge from such a process is not modified Freudianism, but a system of practice and thought which will have a completely changed character. **P A S**

Debunking as Positive Science :
Reflections in Honor of the 25th Anniversary
of Stephen Jay Gould's *The Mismeasure of Man*

Richard York and Brett Clark

The physicist Alan Sokal laid a trap for postmodernists and anti-science scholars on the academic left when he submitted his article, "Transgressing the Boundaries: Toward a Transformative Hermeneutics of Quantum Gravity," to *Social Text*, a left-leaning cultural studies journal. The trap sprang when the journal unwittingly published the article in its 1996 spring/summer issue. The article was intended to parody the type of scholarship that has become common in some sectors of the academy, which substitutes word-play and sophistry for reason and evidence. Sokal purposefully included in his article a variety of false statements, illogical arguments, incomprehensible sentences, and absurd, unsupported assertions, including the claim that there was in effect no real world and all of science was merely a social construction. He submitted the article to test whether the editors of *Social Text* had any serious intellectual standards. They failed the test, and the scandal that ensued has become legend.¹

It is sad to say, but nonetheless true, that some scholars on the academic left have renounced materialism and strayed into a postmodern wonderland in which there is no objective reality and any one factual claim is as good as the next. Such scholars deserve the criticism to which they have been subjected, and one can't blame Sokal, a leftist himself who taught mathematics at the National University of Nicaragua under the Sandinista government, for exposing them as intellectual frauds. However, one of the misconceptions that has emerged out of the Sokal affair is that the left is dominated by anti-intellectualism, and by implication, that the right is the defender of reason. Nothing could be further from the truth.

Marx had a deep intellectual commitment to the Enlightenment, and his historical materialism is fundamentally opposed to the hollow banter and mystical nonsense that Sokal and others have criticized. Marx recognized that science serves as a means to gain a greater understanding of the world. However, he also saw that social relations and conditions of production under capitalism bind science. In "The Civil War in France" Marx indicates that part of revolutionary struggle and the work of a new society is to "convert science from an instrument of class rule into a popular force" and to transform scientists "into free agents of thought." Although some on the left veered toward philosophical idealism as the twentieth century unfolded, Marxists engaged in the movement have generally remained steadfastly materialist/realist. Critical materialism (or critical realism) has been maintained and advanced by many radical intellectuals, including scientists and other thinkers who have written for *Monthly Review*, such as Noam Chomsky, Albert Einstein, Richard Levins, Richard Lewontin, Philip Morrison, and the current and former *MR* editors. In fact *Monthly Review Press* published *In Defense of History : Marxism and the Postmodern Agenda*, edited by Ellen Meiksins Wood (then coeditor of *MR*), and John Bellamy Foster (current coeditor of *MR*), around the same time as the Sokal scandal was in full swing, and the essays in that volume leveled

many of the same criticisms of postmodernism that were made by Sokal and his supporters.

It is, therefore, a sad irony that the left has been identified as having anti-scientific leanings. The right, to a large extent, is based on an anti-scientific foundation. This is most apparent in the silliness peddled by Christian fundamentalists, such as the oxymoronically named "creation science" and its progeny the "intelligent-design" thesis. Bourgeois ideology has long focused on mystical and obscurantist doctrines that deny materialism and reason. In his criticisms of science in the service of the ruling class, Marx was not advocating basing our assessments of factual claims about the social and natural world on ideology, but quite the opposite. Marx was well aware of human fallibility, and, like Francis Bacon and other scholars who laid the foundations for modern scientific thought, he argued that to overcome this fallibility we must explicitly recognize the social and psychological factors that inevitably distort our perceptions of the objective world. However, unlike bourgeois scientists, Marx pointed to the influence of our social position on our perception of reality and the ability of those in power to distort our understanding of social and natural phenomena. Marx noted in *The German Ideology*, "the class which is the ruling material force of society, is at the same time its ruling intellectual force." Marx was advocating that in order to be more objective, we must see through the ideological blinders imposed on us by capitalist society. In this vein, radical intellectuals who are faithful to Marx's vision do not mandate that scientific theories conform to our politics, but insist contrarily, that we be ever vigilant to recognize the imprint of politics (typically that of the ruling class) on scientific theories and endeavor to see the world clearly in spite of the distortions imposed by our social context.

In the finest tradition of Marx, the late Stephen Jay Gould, paleontologist, evolutionary theorist, and dialectical scientist, one-quarter century ago, in 1981, published the first edition of the landmark book, *The Mismeasure of Man*.² Gould provides a devastating critique of the right-wing (pseudo) science of classifying individuals on a one-dimensional scale of supposed inherent intellectual worth. Ironically, the revised edition of this work was published the same year as Sokal's article in *Social Text*, with additional essays debunking Richard Herrnstein and Charles Murray's *The Bell Curve*. It thus demonstrated the continuing importance of a critical science committed to realism, objectivity, and reason, countering rightist ideology thinly disguised as science.

The power of Gould's analysis lies in his focus on particulars. Rather than attempt a grand critique of all "scientific" efforts aimed at justifying social inequalities, Gould performs a well reasoned assessment of the errors underlying a specific set of theories and empirical claims. As Gould writes in the introduction to the revised edition, "*The Mismeasure of Man* treats one particular form of quantified claim about the ranking of human groups: the argument that intelligence can be meaningfully abstracted as a single number capable of ranking all people on a linear scale of intrinsic and unalterable mental worth" (20); it "is a critique of a specific theory of intelligence often supported by particular interpretation of a certain style of mental testing: the theory of unitary, genetically based, unchangeable intelligence" (40). This approach is emblematic of Gould's style: He does not attempt to tackle the great questions head on in an abstract and general way, but, instead, sneaks up on these questions by a careful analysis of the details of particular cases – here examining the work of the historical originators of this form of biological determinism.

His tight focus makes his critique all the more devastating, leaving the research tradition

behind such works as *The Bell Curve* in shambles. In the process of critique, he also illustrates the power of leftist science properly applied. He does not start by denying factual claims because of a distaste for their political implications. Rather, recognizing that factual claims must be tackled based on reason and evidence, not ideology, he undertakes an analysis of the reasoning underlying specific claims about the nature of human inequality and the evidence used to support such claims. In this way, he allows the insights of the critical tradition to alert him to instances of ruling-class ideology embedded in scientific theories, but he does not expect left ideology to dictate the answers to empirical questions. Gould recognizes that our ideological commitments and intellectual allegiances alert us to questions that need to be asked, but they do not provide the answers to these questions. Only reasoned analysis can do that.

Here we provide a brief review of some of the key lessons of *The Mismeasure of Man* about how the ideas of the ruling elite become embedded in scientific theories that are then used to legitimate prevailing social inequalities, and how to look for the telltale signs of the dogma of the dominant class in supposedly objective research. The most blatant manner in which the elite sculpt research findings to conform to their ideology is by the purposeful fabrication of data, a task made all the easier by the fact that academia is dominated by people from socially privileged backgrounds. But, as Gould demonstrates, the insidious influence of reactionary ideology permeates work in a number of ways.

Although flagrant academic dishonesty is presumably uncommon, one of the foundational studies used to support the claim that intelligence is highly heritable and that the social environment has little influence on the abilities of individuals is based on manufactured data. Gould retells the widely known story of Sir Cyril Burt (1883-1971), an influential British educational psychologist, who reported analyses of the IQs of fifty-three pairs of identical twins separated at birth and reared apart. His analyses found a high correlation between the IQ scores of the twins, and this provided the basis for his widely touted claim that IQ was not much influenced by the environment. In fact, Arthur Jensen, in his notorious 1969 article in the *Harvard Educational Review*, used Burt's analyses to support his argument that differences intelligence between whites and blacks in the United States were innate and ineradicable. As the investigations by Princeton psychologist Leon Kamin and the medical correspondent for the London *Sunday Times*, Oliver Gillie, revealed in the 1970s, Burt not only fabricated his data, he manufactured two "collaborators."

Of course, purposeful dishonesty is the most obvious manner in which to manipulate research to support a political agenda. More interesting, and presumably more common, are distortions that emerge from the unconscious bias of researchers. Once again, this type of manipulation of research findings serves to perpetuate the ideology of the ruling class because research is often conducted by scientists that pander to the social elite. An interesting example of such bias comes from Samuel George Morton, a nineteenth-century practitioner of craniometry – the speciality that focuses on measuring human skulls. Morton claimed that his study of differences across race in cranial capacity showed that whites have larger brains than people of other races, particularly those of African ancestry. This naturally fit well with the view that whites were ordained to rule over other races and served to justify slavery and other institutions of racial inequality.

Gould, recognizing the potential for unconscious bias in the analysis of data, did not take

Morton's reported statistics at face value, but rather chose to reanalyze the raw data (which Morton faithfully published) himself. Gould notes that

Morton's [statistical] summaries are a patchwork of fudging and finagling in the clear interest of controlling a priori convictions. Yet — and this is the most intriguing aspect of the case — I find no evidence of conscious fraud; indeed, had Morton been a conscious fudger, he would not have published his data so openly. (54, original edition)

In brief, Gould found Morton's distortions fell into four general categories. First, "Morton often chose to include or delete large subsamples [within racial groups] in order to match group averages with prior expectations" (68). Second, Morton would measure cranial volume by filling skulls with seed, and then pouring out the seed and measuring its volume. Seed, however, can be packed to differing densities, so that measurement has a subjective element — i.e., the measurer (Morton in this case) decides when a skull is full and the seed is packed to the "correct" density. Subsequent re-measurement of the same skulls that Morton measured using lead shot, which cannot be packed, instead of seed showed Morton systematically underestimated the volumes of the skulls of non-whites relative to those of whites.

Third, Morton failed to perform what would seem to be obvious procedural corrections for differences in sex or stature across samples. Brain size is most meaningful not in an absolute sense, but relative to body size — i.e., people with large bodies have, on average, large brains relative to people with small bodies, although intellectual abilities do not appear to be related to body size. Controlling for gender is highly important because women have, on average, smaller bodies than men and, therefore, smaller brains (although no smaller relative to body size). Morton never controlled for differences in gender composition or average stature across samples, and thus his findings of differences in cranial size across racial groups to a large extent reflect differences in gender composition and body size across groups in his sample. For example, "Morton used an all-female sample of three Hottentots to support the stupidity of blacks, and an all male sample of Englishmen to assert the superiority of whites" (68).

Fourth, Gould found that in all the instances of miscalculations and apparently accidental omissions made by Morton, the results favored the inflation of cranial size estimates for whites and the deflation of cranial size estimates for non-whites. Gould, once again, notes that he found no evidence of purposeful fraud: "All I can discern is an a priori conviction about racial ranking so powerful that it directed his tabulations along preestablished lines" (69). Gould's careful reanalysis of the original data provides powerful evidence of how scientists can sculpt data to fit their a priori convictions without intentionally committing fraud.

In a similar case, Robert Bennett Bean, a Virginia physician following in the craniometric tradition who was active at the beginning of the twentieth century, studied the brains of cadavers. He identified the key indicator of intellectual ability as the ratio of the genu, the front part of the corpus callosum, to the splenium, the back part. He argued that whites were superior to blacks and men to women in intellectual ability based on his finding of relatively larger genu in whites and men. The fact that he focused on this criterion, rather than the more traditional brain *size* preferred by other craniometrists, is striking. "The reason for this neglect [of brain size]," Gould explains, "lies buried in an addendum: black and white brains did not differ in overall size" (79). Thus Bean sought an alternative avenue for explaining inequalities.

Bean also made measurement errors reminiscent of those made by Morton. Bean's mentor at Johns Hopkins, Franklin P. Mall, became suspicious of Bean's data because it was simply

too good. He repeated Bean's work and found quite different results. Mall attempted to be more objective by making his measurements of brains *before* he knew the race of the person from which each had come (Bean knew the race of the person from which each brain had come before he measured it). In his study, Mall found no clear difference between the brains of whites and blacks or between those of men and women. Furthermore, he examined 18 brains (10 whites, 8 blacks) from the sample Bean had studied and found that Bean's measure of the genu was larger than his in the case of seven whites, but only one black, and that Bean's measure of the splenium was larger than his for seven out of the eight brains of blacks. Bean's biased expectation had clearly influenced his measurements, thus allowing him to construct a finding of differences between the brains of black and whites and men and women where likely none existed.

As the reactionary scientists failed to establish valid biophysical explanations for social inequality by measuring skulls both on the outside (using calipers and rulers) and the inside (using mustard seed and lead shot), they moved into the realm of measuring "the content of brains by intelligence testing" (23, revised edition). It is here that the error that perhaps receives the bulk of Gould's attention is to be found: *reification* — the process of treating as a real entity something that is in fact an abstract concept. Cyril Burt and current advocates of the notion that intelligence is literally a one dimensional feature of the brain that is measurable by psychometric tests are guilty of reifying IQ argue that there is a general underlying intellectual ability in each of us, *g*, that is measured reasonably well by IQ tests, in spite of the evidence suggesting that *g* is a product of the tests themselves, a statistical creation, not a genuine mental attribute.

In an unflinchingly rational manner, Gould devastates this "IQ as indicator of general intelligence" interpretation by showing it to be a creation of the statistical procedures used and the a priori convictions of the researchers. The general intelligence factor emerges from factor analysis of a variety of mental tests. Factor analysis is a statistical procedure that attempts to explain the covariance among variables (various mental tests in this case) by extracting one or a few factors that can account for the observed inter-correlations (individuals' scores on different tests tend to be positively correlated with one another — i.e., people who do well on one type of test tend to do well on other types). IQ proponents have long argued that only one factor is necessary to explain observed correlations among a variety of mental tests, which they take to indicate the existence of a general intelligence that is an actual characteristic of the brain. However, as Gould explains, factor analysis does not work magic; it is entirely based on the observed correlations among tests. The belief that a factor extracted via factor analysis is a real entity is based on the heroic assumption that the variables under analysis (performance on various mental tests in this case) are connected by an underlying causal regime (stemming from a feature of the brain). This assumption is not and cannot be established by statistical methods alone and is only valid to the extent that correlation is indicative of causation. Although determining correlation is *necessary* for establishing a causal relationship among variables, it is not *sufficient*. Factor analysis alone simply cannot adjudicate the matter of causality, nor establish whether a factor corresponds with a real entity.

Gould points to the work of L.L. Thurstone in the first half of the twentieth century that unveiled the error of equating a factor extracted via factor analysis with an actual characteristic. Thurstone showed that the types of mental tests included in the factor analysis greatly

affected the results of the analysis. Furthermore, he illustrated that several different factors could be extracted from the same data depending on how they were analyzed, and that there was no objective reason to prefer the assertion that a single mental ability underlay performance on a variety of tests to the assertion that multiple and distinct abilities were the determinants of test performance. It is, of course, also important to recognize that none of these types of tests and statistical analyses served to establish whether intellectual ability was primarily innate or the product of social privilege.

The most general error of the biological determinist research that Gould reviews centers on the proclivity of scholars to interpret ambiguous evidence in a manner that confirms their prior convictions. This is a more general error than that represented by the miscalculations of Morton, the fabrications of Burt, and even the reification of factor analysts. We are faced with a complex world where there is no single clear and unambiguous piece of evidence that can answer many of our most pressing questions and resolve our intellectual disputes. In these circumstances, researchers are forced to survey a breadth of information and attempt to reach a reasoned conclusion. However, given the complexity and ambiguity inherent in such circumstances, even well intentioned researchers are prone to searching out evidence that supports their prior beliefs, neglecting evidence that contradicts them, and interpreting ambiguous information in their own favor. Gould provides several fascinating examples of this phenomenon from the history of biological determinist mental testers.

In particular, there are examples of the application of ad hoc explanations and special pleading by researchers to maintain their preferred theories when evidence contradicts their expectations. This has often involved shifting the data to be examined as theories change so that while the specific grounds on which claims for inequality were based become discredited the general conclusions remain unchanged (e.g., those belonging to the dominant class, race, and/or gender are superior to everyone else).

The work of Paul Broca, perhaps the most renowned craniometrist, and his followers illustrates well the reliance on ad hoc explanations to preserve a preferred view in the face of contradictory evidence. As Gold explains, Broca made efforts to measure the brains of eminent men after their deaths, expecting that the most renowned men would have brains much larger than average. Although some of these candidates did have large brains, others had merely average sized brains, and some even had brains strikingly below average. Undeterred, Broca relied on a variety of tactics to explain away "anomalous" findings. In some cases he argued that although a particular brain of an eminent man may have been average or smaller than average it was especially convoluted, which he took to be an indication of intellectual ability. In other cases he argued variously that the subjects had died very old, and their brains had thus degenerated, the brain was poorly preserved, or the person in question was of small stature and, thus, had a respectably sized brain for his body. of course, none of these types of special pleading were applied to excuse a small or average brain size of a person who Broca had not a priorj judged superior.) Perhaps the most peculiar tactic, when all else failed, was to argue that men of great achievements who had small brains must not have been so great after all !

The story of the recapitulationist theory of evolution provides a striking example of scholars picking and choosing among which pieces of evidence to focus on so as to fit the facts to their preconceived notions. German Zoologist Ernst Haeckel, an early convert to Darwinism, but with

his own idiosyncratic take on evolutionary theory, developed the position that "ontogeny recapitulates phylogeny," – i.e., as individuals develop from an embryo to an adult (ontogeny) they go through all of the stages of adult form from their evolutionary history (phylogeny) – a now discredited view that was much in vogue at the end of the nineteenth century and the beginning of the twentieth. This theory assumed there was a progressive nature to evolution, where "advances" were made by speeding up early stages of development and adding on new stages. Based on this view, adults of less "advanced" races were expected to be similar to children of more "advanced" races. For example, E.D. Cope, a well-known American paleontologist and supporter of this view, identified four inferior groups: Women, non-whites, whites of lower social class, and white southern Europeans. Supporters of this position claimed a variety of anatomical and physiological characteristics that marked the adults of these supposedly inferior groups as being like white male children of northern European ancestry.

The theory of recapitulation collapsed by the end of the second decade of the twentieth century. Following this, the Dutch anatomist Louis Bolk developed a theory of exactly the opposite view of development. He proposed that humans had diverged from apes not by speeding up developmental processes, but slowing them down, so that juvenile traits of ancestors become the adult traits of descendants – a phenomenon referred to as neoteny ("holding on to youth"). He noted that adult humans have many features in common with juvenile apes, including a large brain relative to body size. After decades of supposedly objective scientific work proclaiming that "inferior" groups such as non-whites were childlike, with this new theory and its implication that more childlike was more advanced in mind.

Bolk reached into his anatomical grab-bag and extracted some traits indicating a greater departure for black adults from the advantageous proportions of childhood. Let by these new facts to an old and comfortable conclusion, Bolk proclaimed "The white race appears to be the most progressive, as being the most retarded." (121, original edition)

Here we see most clearly the smoking gun of ideology imposed on the world. When theory suggested that being childlike was a mark of inferiority, oppressed groups of people were identified as being childlike based on supposedly objective analysis. However, when a new theory emerged that suggested that being childlike indicated superiority, new data was found to support the contention that the dominant social group was the most childlike.

It is fascinating that among the many efforts to establish inherent differences across race, gender, and class in mental ability, the indicators of intellectual ability that have been utilized never have been established actually to measure an innate and immutable intellectual ability. As Gould notes, not only has it still to this day not been firmly established that races systematically differ in average cranial size, there is little evidence that cranial size is even especially related to intelligence within a species, with the exception of extreme cases where the brain fails to develop properly. The degree to which IQ measures an innate ability remains highly contested, and the extent to which is heritable is still not firmly established. In fact, as Gould's close colleague Richard C. Lewontin points out in *Biology as Ideology*, all existing studies of twins reared apart have methodological flaws that undermine their conclusions (e.g., separated twins are often raised by close relatives, so that twin pairs frequently share similar socio-economic and cultural circumstances). It is remarkable, then that the base assumptions behind much of biologically deterministic research – e.g., cranial size corresponds to intellectual ability, IQ measures a real and innate property of the mind – go unquestioned and are

merely asserted as true without sufficient supporting evidence.

What is remarkable about *The Mismeasure of Man* is that it provided a definitive critique of the reasoning behind *The Bell Curve* thirteen years before the latter was published. As Gould remarked, "The critique of biological determinism [is] both timeless and timely," and it is of utmost importance weapon" (26-27, revised edition). The recurrence of biological determinist arguments is a sociopolitical manifestation related to periods of "political retrenchment and destruction of social generosity" (28, revised edition).

The revised edition of *The Mismeasure of Man*, published in 1996, extended the original by including essays that explicitly critique *The Bell Curve*, Gould shows how Herrnstein and Murray committed virtually all of the same errors of reasoning committed by earlier biological determinists that the original edition to *The Mismeasure of Man* debunked. As Gould explains with razor sharpness, Herrnstein and Murray accept without thoughtful reflection that IQ tests measure a singular, one-dimensional intelligence that is highly heritable and largely immutable, although the balance of existing evidence does not support this view. They then march ahead, with this dubious presumption unquestioned, to argue that IQ is a key factor determining where individuals end up in society, that it therefore varies across social classes due strictly to merit driven stratification, that blacks are typically on the lower rungs of society because they have on average lower IQs than whites and other races, and that all of these "facts" taken together indicate that social programs aimed at improving the lot of the poor are a waste of effort, since the poor occupy their social position due to their inherently inferior intellects. All of these dubious claims are supposedly established by a highly selective reading of existing evidence, where findings suggesting interpretations counter to their own – e.g., IQ is influenced by social position, therefore lower IQs among the underprivileged are the *effect*, not the cause, of inequality – are ignored; by wild speculation in the absence of appropriate evidence; and by reifying IQ in the same unthinking manner as their biological determinist predecessors.

It would be hard for any sensible person, even if she or he be unsympathetic to the left, after seriously considering Gould's critique, to accept *The Bell Curve* as representing anything but a politically motivated effort to interpret ambiguous evidence so as to support an a priori preferred position, in spite of the fact that much of the evidence cries out for an opposite interpretation. *The Bell Curve* is perhaps one of the best examples in recent times of right-wing ideology dishonestly presented as objective science. Eternal vigilance and scientific investigation are necessary to disarm the ruling class or their ideological weapons and scupper their attempts to justify social inequality.

One of the most important lessons we can learn from Gould is that we should neither reject the ideal of seeking objective knowledge of the world nor assume that scientists operate in an objective manner, conveying the truths of nature unsullied by social preconceptions. Although none of us can be truly objective, we can strive toward this ideal by recognizing our own preconceptions and engaging in thoughtful, reflexive self-critique. In this, we become embedded in a process of confronting the world and our own biases, as well as those of other people. Gould closes the original edition with an argument that debunking can serve as positive science. We can learn a great deal from studying where researchers go wrong. The dialectic of argument and counter-argument is central to the advancement of knowledge. Since the scientific establishment remains dominated by those sympathetic to the concerns of the economic elite, debunking flawed research should be a central part of the left's intellectual

agenda. Radicals should not slip into the anti-intellectualism that Sokal exposed – intellectual dishonesty and fashionable nonsense in service of a just cause are dishonest and nonsense nonetheless. The rejection of reason will only serve to undermine the ability of the left to speak truth to power. We will be best served by sticking to the intellectual roots established by Marx, where socialism stands for a commitment to reason and fights the vapid dogma and pernicious ideology endlessly pedaled by the right. Gould's work serves as an example of how the light of reason can lay bare the false claims of those who wish to perpetuate injustice and inequality and can lead us to a better understanding of the material world in which we live and struggle.

Notes

1. The Sokal affair, including the original article and many of the subsequent comments on it by a variety of scholars, is recounted in *The Sokal Hoax: The Sham That Shook the Academy*, edited by the editors of *Lingua Franca*, the publication in which the hoax was first revealed. Sokal and Jean Bricomont published *Fashionable Nonsense: Postmodern Intellectuals' Abuse of Science*, which serves to debunk much of the gibberish that counts as scholarship in some sectors of the academy. Paul Gross and Normal Levitt's book *Higher Superstition: The Academic Left and Its Quarrels with Science*, published in 1994, in part inspired Sokal to perform his hoax. Gross and Levitt deserve credit for rightly criticizing some anti-science scholars, but, unfortunately, present only a partial truth, in that they fail to seriously acknowledge the strong anti-science tendencies of the right and the long tradition on the left of commitment to reason.

2. It is worth noting that Gould recognized the potentially sexist nature of using the term "Man" to refer to all people. He notes "My title parodies Protagoras's famous aphorism about all people, and also notes the reality of a truly sexist past that regarded males as standards for humanity and therefore tended to mismeasure men, while ignoring women" (20, revised edition).

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P A S

Stephen Jay Gould : Was it Survival of the Luckiest?

Curt Schleier

The asteroid was about 6.2 miles in diameter, and its impact when it struck the earth was enough to create a hole 100 miles wide. The power of the collision – which took place about 65 million years ago – was so great it pulverized the asteroid, in the process raising a dust cloud sufficiently large to blot out the sun for years: no photosynthesis. No plants. Soon, nearly all life was wiped out.

Welcome to the world of Stephen Jay Gould, the nation's best-known paleontologist. As a paleontologist, Gould studies the geological record – fossils and rock samples – left by cataclysms like this to discover the history of life. For him, time is measured in millennia rather than days, there is only one gigantic continent (called Pangaea), and humans – who've been around for only 100,000 years – are but a tiny blip on the evolutionary timeline.

Gould's office is the academic equivalent of a primordial swamp. There are books everywhere, on shelves that reach so high you need a ladder to get to them. But you can't move the ladder, because it's wedged in among piles of books and magazines so large that the room might be a good place for Navy Seals to do obstacle training. Gould works at a pre-bali IBM electric typewriter. His desk is an old rolltop, the chair collapsing on contact, prompting him to bring in a sturdier replacement.

A professor at Harvard University, Gould is curator for invertebrate paleontology at the school's Museum of Comparative Zoology. In his monthly essays for *Natural History* magazine and in his many books, most recently *Questioning the Millennium*, he has shown a keen mind, and – more unusual in the world of science, where writing is typically jargonfilled gobbledygook

– the ability to simplify the complex without talking down to readers.

But Gould is more than just an intellectual; he's a fighter. Fifteen years ago, he was diagnosed with a rare form of abdominal cancer which literature said was incurable. Although the median life expectancy was eight months, Gould decided to treat the disease aggressively. Today he is as cured as one gets after battling cancer.

When not teaching, Gould spends most of his time in New York City. He shares a giant SoHo loft (formerly a doll factory) with his wife, Rhonda Shearer, an artist whose sculptures decorate the well-lit gallery-quality space that greets visitors when they get off the elevator.

A native of Queens, Gould is the son of a court stenographer and a housewife. But from the age of five, Stephen knew he wanted to be a paleontologist after his first visit to the Museum of Natural History, where he saw a model of a giant dinosaur. He does not find his career genesis as remarkable as most visiting journalists seem to, however. Paleontologists usually find their calling early on, he notes, "either because they live in the country and collect fossils or live in the city and visit museums."

At the center of paleontology is Darwinism: the theory that life began with single-celled organisms and eventually evolved into more complex life forms – fish, amphibians, birds, mammals, and humans. Animal species flourished by adapting to local environments, and those that adapted best prospered, a concept known as natural selection or survival of the fittest. As Gould explains, most people see evolution as a pyramid, with humans at the top. But he maintains, that appealing concept is incorrect:

Biography : You don't believe in using the terms "higher" or "lower" in describing different species. Why is that?

Gould : "Higher" is only relevant to some criteria. There is no absolute [standard against which] you can [measure rank]. If you chose to focus on neurological complexity, I guess we humans are most complex. But if you choose to focus on biochemical diversity, then bacteria have it all over us. And if you want to focus on range of potential environments, bacteria live inside rocks and places we can never get to. It all depends on your criterion, and most of the criteria by which we judge humans superior are just prejudices based on our desire to honor ourselves. After all, there are about a million named species of animals, of which humans are only one. There are only 4,000 species of mammals. There are almost a million species of insects. We're just not a very prominent group. We've had a very great impact on the planet, but you can't confuse impact with the status of an organism.

Biography : You've written that most people "equate evolution with progress, and define human evolution not simply as change, but as increasing intelligence, increasing height, or some other measure of assumed improvement." But you don't subscribe to that conventional wisdom. Why not?

Gould : Again, we represent just one line of hundreds, of thousands, millions [of creatures] actually. First of all, you can't define "improvement" except with respect to some chosen criterion, which is preselected to validate human importance, such as neurological complexity. But humans are not even by definition the most complex vertebrate. We're neurologically complex: We have more brain power than others. But suppose you started measuring skull-bone complexity, for example. Fishes have it all over us. Or tooth complexity; all sorts of mammals have it over us. It all depends on what criterion you choose. There is no objective criterion whereby you can delineate evolution [moving in any one direction]. So where's the overall march to progress we're supposed to see?

Biography : But isn't bigger better, in the sense that the bigger you are, the better able you are to be dominant in a fight for food and mates?

Gould : That is a very prejudicial view based on a bunch of cultural stereotypes about battling males and coy females. It is just as likely that the little guy who can sneak in and around is more successful. I don't think there's any general pattern. Sometimes big has advantage, but that's certainly not a generality. I would say there are many ecological and evolutionary circumstances where small has advantages over big. If it were true even within a species that bigger were usually better, you would have evolutionary trends towards bigger, which is not happening.

Biography : But humans are getting bigger. Doesn't that mean anything?

Gould : No. Insofar as they are getting bigger, it has nothing to do with evolution; it's just nutritional improvement. In fact, there was a paper which argued that humans are a little bit smaller than in various times in the past. Samples show that the average height of Cromagnon man, 40,000 year old Europeans, was about six feet. The average height of most males today is a good deal lower than that.

Biography : I think most people want to believe that there is some order to the universe, that we are the result of some grand master plan. But you feel we're just an accident.

Gould : No more so than any other lineage. The fact that you have a human and a hippopotamus and an oak tree rather than any number of other things you could have had is in every case wildly improbable. If you run the tape again, you'd never get the same outcome because there are too many alternate possibilities.

Biography : Can't you say that humans are a logical outgrowth of evolution, even in hindsight?

Gould : Never. I don't think anyone would have predicated. "Hey, I bet this thing is going to go on two legs and lose its hair and get a big brain." It's just a set of circumstances. Good for us. Glad it happened. We're certainly successful, but by no means predictable. I think even if you go back 100,000 years: You have modern humans as a little population somewhere in Africa and other species in Europe and Asia. What predictability was there even then that the population in Africa would spread out all over the world, displace the others, and become what we are today? Do I think that there's a master plan? That's not a subject that science can take up at all. It's not anything scientists can get at.

Biography : Do humans have a purpose?

Gould : Again, that's not a [subject of] scientific inquiry. I think it behooves us as ethical beings to define some purpose in our own minds.

Biography : As a scientist, do you ever wonder why something happened in other than a strict scientific sense?

Gould : If I had enough evidence about a particular transition, you might be able to figure out a mechanical why. But there's no overarching cosmic "why" that science can get at. That's not what science does. You're asking me an ethical or spiritual question. I don't. I don't think it's a very meaningful one.

Biography : Do you ever ask cosmic questions?

Gould : There's a whole range of important questions that science just isn't constructed to answer. Like ethical questions. Science is an enterprise about discovering the factual nature of the universe and trying to figure out why the facts are set up that way and why they exist that way instead of some other way. There's nothing science as an enterprise can do about telling

you what's a good way to live or what's the meaning of life. Of course, one wonders about those things. Those are great questions people have asked through the ages. You have to address them as an ethical being. You have to solve these issues for yourself. You have to decide the moral code by which you're gonna live. Science is not going to get you those answers.

I wouldn't ask science to compose pieces of musical beauty, and I wouldn't ask it to solve moral questions. But I wouldn't ask musicians to tell me how humans evolved, either. I think each discipline has a range of things it can do. Moral inquiries are one thing and factual inquiries are another, and you can't confuse them. As a scientist, I can't ask those kinds of [philosophical] questions, because science doesn't get at them, I can, as a curious human being, ask them. I don't happen to think most of them have answers.

Biography : How have recent scientific advances in such fields as DNA research affected Darwinism?

Gould : They have mostly confirmed it. Forty years ago, you barely knew there was DNA, Now you use it fairly mechanically. That's why we know O.J. Simpson is guilty, even though the jury didn't think so. For example, you can now make evolutionary trees by looking at overall similarities of DNA structure [between two species]. When you do that, it pretty, much confirms what you knew already about evolution. For example, it's not surprising that cows are closely related to sheep and horses are further away and snakes are further away than that. But you can confirm that with a whole different set of data than was available 40 years ago.

Biography : Do you believe in God?

Gould : There are a thousand definitions of God. I don't think there's a fellow sitting in the clouds with a long beard. There are some definitions of God that are so benevolent that I might be willing to entertain the notion. In any case, as Huxley said, since the issue is not subject to proof, the only honorable attitude is agnosticism. You don't know because you can't know.

Biography : Are the words "religious scientist" an oxymoron?

Gould : There are a lot of religious scientists. There are also a lot of atheistic scientists. They're just different subjects. I don't think being a scientist predisposes you particularly one way or the other. Religion to me is a question about ethics.

Biography : The world was one large continent 250 million years ago and then split apart. Looking at a map, it seems obvious that it was all connected at one point. But it seems it took scientists a long time to figure that out. Why?

Gould : In retrospect, I think that's right. South America and Africa really do fit very well together, and that was recognized by some people as soon as we had good maps. The impediment was that nobody could figure out a mechanism that could get continents to move. So even though – and you're quite right-there were good reasons to entertain that hypothesis, until physics and geology could figure out a mechanism that could get big continental blocks to move over the earth's surface, it was n't going to be a very popular idea.

Biography : Do scientists sometimes not see the forest because of the trees?

Gould : We're human beings. No, I don't know why [anyone thinks scientists have a higher level of common sense than ordinary people]. Scientists have mastered a set of procedures that help them get at proving things once they figure out a good theory, but I don't know that scientists are, on average, more creative than other scholars. Scientists are pretty good at testing, but I don't know if they're any better than anyone else at getting results.

Biography : Is creationism still a threat to the teaching of evolutionary science?

Gould : It's hard to say. I don't think it's powerful enough to have a major impact on American

education, thanks to First Amendment protection and successful legal battles. So in that sense the creationists are not going to beat us, but they're pesky. There are a lot of them. They're well funded. In local areas, they can be quite powerful and can have an impact on local school boards and local school districts, which is no problem in liberal constituencies such as New York and Boston. But in a little school district in Arkansas, yeah, it can be a problem.

Biography : Do humans have a future?

Gould : All organisms become extinct. The average life of marine invertebrates is five to ten million years, which is a long time. Humans have been around 100,000 years. The life of a species is a complex historical circumstance. It depends on how climates change, who competes with us. There's no reason why, if we're smart about it, we can't be around for any conceivable future that we care to think about.

Second Interview

Question : Is evolution universal : would evolution on other worlds operate similar to Darwinian evolution?

Gould : The problem with the history of life is that we only have one experiment. All life on earth, by virtue of great biochemical similarity, we assume, came from one origin, and therefore the fact that all living things are similar on this planet gives us no insight whatsoever into the crucial question of whether life has to be organized the way it is or whether what we see on earth is only one possibility among a hundred million unrealized alternatives.

I don't really know any way to get at that question except the experimental hope that we'll someday encounter living systems that independently evolved on other worlds. That's why the question of whether or not life exists on that Martian meteorite raises such legitimate excitement. It probably doesn't, although the case is plausible. What we're desperate for is a second independent experiment in the origin of life; then we can draw some of those conclusions. Without that, it's all speculation.

Question : If you had to speculate about a second example of life, of extraterrestrial life, would you expect commonalities?

Gould : I have tried to argue that unpredictable contingency rules the pathways of history in that prediction is a subject we shouldn't even entertain much for the history of life. And I'm going to stick with that. I really don't think there's whole lot of very great interest in any detail that one would want to predict about life on other worlds.

The oldest rocks on earth that could contain organisms are 3.5 to 3.6 billion years old, and they do have life in them, so life on this planet originated about as quickly as it could. At the most, I might be willing to say that you could make an inference that, given planets like the earth and given conditions such as we find on earth – that there may be commonalities, given the nature of organic chemistry and the physics of self-organizing systems being a predictability if not a virtual inevitability of the origins of some form of living creatures. That's a very different subject from what evolutionary pathways they take later. We need to get direct evidence; all the more reason to hope that some day we'll have evidence of life elsewhere.

Question : Rather famously, you've compared life to a bush rather than a tree. How does the evolutionary bush look?

Gould : The reasons I was emphasizing bushes as opposed to trees is at least certain trees have, as their anatomy, a very strong central trunk and a bunch of side branches. That leads to undue and unfortunate support for the rather biased and prejudicial notion that the history of life has a central directionality represented by the main trunk of the tree.

The reason why I think you ought to think in terms of bushes is that if anything's characteristic of life, it is its multifariousness, it's diversity. A bush doesn't have a central fundamental pathway, it just has a common root. You do need to have a common root source, as evolutionary theory does insist on common ancestry for related living things. But once you have that common root, the bush can go off in hundreds of directions with no preferred pathway. That's why I think it's a better metaphor or better model for depicting the history of life.

Question : What's missing from the Darwinian view of things? Do we now understand evolutionary principles completely?

Gould : I think we certainly have developed and validated some very basic, general and, I think one can say, true principles that regulate evolutionary change, of which natural selection is the most important. But we certainly don't have anything like a complete explanation or a complete catalog of evolutionary mechanisms.

As a paleontologist, I think what's most lacking is adequate theory to explain the full range of large-scale events in the three and a half billion years of life's history. It's not clear to me that you can take Darwinian processes operating in small scale and, just be extrapolating them through hundreds of millions of years, in every case explain everything about the pattern of life as just ordinary processes operating on a weekly or monthly or yearly scale extended.

The most obvious example, of course, is mass extinction. That is, the history of life is patterned to a large extent by these very brief episodes, some of them catastrophically triggered such as the one that wiped the dinosaurs out 65 million years ago. That was pretty clearly instigated by impact from an extraterrestrial object. These mass extinction have occurred at least five times in the 500 million year history of complex animal life. They play a major role in helping us to understand the waxing and waning of groups and why some groups dominate and others don't.

So if you want to ask, for example, why mammals are here and dinosaurs are gone, the answer is not going to come out of ordinary Darwinian competition and the daily struggle for existence, because it all happened as a result of this large extraterrestrial body that struck the earth 65 million years ago, and for reasons we don't fully understand, wiped dinosaurs out and mammals managed to survive. It was not, one assumes, for any reason of their inherent superiority in competition against dinosaurs, because, in fact, they had competed against dinosaurs for 100 million years before that and had never displaced them.

The pattern of life's history is a complex mixture of who wins and survives an ordinary Darwinian competition extended in normal times, and the fortuity of who does or doesn't get through these mass extinctions for which no one can prepare. To that extent, conventional Darwinism can't explain all of the pattern of life's history. You need to introduce into it an understanding of what happens in the larger scale of things.

Question : What are your thoughts about intelligence as a glorious evolutionary accident?

Gould : I don't think anyone would doubt that the gap between what humans uniquely do and any other species does is immense. It's based on language, it's based on the development of technology. Just in terms of impact on the surface of the planet, I think that's evident – I don't think that's just human arrogance.

The main reason for considering intelligence in that efficacious form (and I don't necessarily mean good) as accidental is pretty clear. It's only evolved in one species after four and a half billion years of the history of the earth, which is about half the earth's potential history if the sun's due to explode in five billion years or so. That's pretty amazing. There are only

4,000 species of mammals. We're a minor group.

Consciousness has only arisen in one species, us of a minor order of mammals: the primates with fewer than 200 species in toto. You have a million named species, including about 500,000 beetles. So if intelligence was such a good thing, so obviously a Darwinian benefit, and easy to achieve, I assume other lineages would have – but they haven't. And yet they're doing very well. I think the best evidence of the accidental nature of intelligence, is the very sparse distribution of this phenomenon after three and a half billion years of life, and four and a half billion years of the earth's history. **P A S**

Taking with Stephen Jay Gould

[conducted as part of the PHD student symposium and the new EMBL-DAI Science and Culture and Culture initiative]

Do you think that the number of mechanisms Required to Account for present life on Earth and the fossil record Needs to be enlarged beyond traditional Ideas of evolution through variation and Natural Selection?

I don't think it's really so much a question of new mechanisms. It's how the mechanisms that we're more or less familiar with operate over the broad scales of time that create the macroevolutionary record. For example, we know how the mechanism of natural selection works, but in strict Darwinian theory, it operates on organisms within populations. Changes within populations, by extrapolation, then produce the full panoply of changes in the history of life. This yields a fully reductionistic, single level account of evolution: microevolutionary Darwinism working within populations, at the level of the organism, produces everything. The way many paleontologists and I look at the world – I think this can be called a general movement within evolutionary theory today – is to recognise that natural selection operates on other kinds of biological "individuals" which have the requisite properties. Under certain circumstances, groups within species, or species themselves, are discrete entities that have birth points and death points. They are quite stable, and they have differential numbers of offspring which look like them. These are all the characteristics you need for Darwinian individuality, so selection can also operate on the properties of species, particularly on emergent properties of species that can't be reduced to the characteristics of organisms.

Now in a sense we understand the mechanism of selection, but when you treat a species as an irreducible entity, you are explaining trends as the differential success of species rather than an extrapolated Darwinian triumph of the individual organism. This leads to a different set of explanations for things – not a new mechanism, but the application of the selectionist argument to different levels of organisation. That is one kind of addition you need to make to evolutionary theory. It's not anti-Darwinian but it certainly expands and changes the scope of the original theory.

Wouldn't Global Catastrophe, such as A massive Meteorite Striking The Earth, Have A qualitatively new Type of Effect Are Regionally Restricted, Meaning That Populations of A Species which Had Moved outside A Particular Region Might Well Survive.

A global event would cause populations which have undergone local adaptations which have undergone local adaptations to adapt to global change, and that's what's unexpected. As

you know, under Darwinian theory if the environment changes too fast for most organisms to adapt, then they die. Things are different when unpredictable, major environmental changes result in catastrophic mass extinctions and have a fortuitous effect on a large part of the patterning of evolutionary change. You could never, by studying ordinary natural selection in normal times, predict that mammals would win over dinosaurs. In normal times before the mass extinction, they never did – they were always out competed by dinosaurs. It took an external trigger of catastrophic change to do dinosaurs in while letting mammals get through. Not because mammals were better, but because mammals fortuitously had certain properties that enabled them to survive.

There was evidence for catastrophic mass extinction when Darwin wrote the Origin of Species; he tried very hard to reinterpret that evidence as due to imperfections in the geological record, and to see it as the result of ordinary, slow environmental change. In his view there might have been accelerations of environmental change, but these wouldn't have been fast enough or of wide enough scope to really discombobulate everything. The crucial factor is less the globality of the event than its major impact, one to which local creatures could not have adapted. A species' prior adaptive successes won't predict whether it will fortuitously survive such a catastrophe. Extrapolating from Darwinism, local adaptations tend to accumulate to some general state of biomechanical improvement for a species through time, which will help it get through less catastrophic events.

Could behavior as well as Geography Lead to isolation and speciation? For Example, Let's Say That A Local Town Here want to get rid of a massive population of wild cats. They go around chasing and eliminating animals, but they Don't have a lot of money to spend on it, so they miss the really wild ones, Which survive. Another type to survive is very Feiendly and Cuddly and gets taken by people, there may be no definable genetic Difference between the groups, But each would be a survival strategy.

You are suggesting the "Pied Piper" theory applied to cats in Heidelberg, instead of rats or children in Hamelin. Well, isolation only creates the potential for speciation. The precondition of speciation is that a group becomes so isolated and separate that it will breed only within itself. Conventionally, it was hard to think of a way to achieve that isolation except by true geographic separation – how would it happen if the populations shared one area? But what you're suggesting is not so far-fetched. I think there are a set of ways whereby isolation can be achieved by behavioural differences. Normally, of course, it would be something besides human selection – perhaps one group may just begin breeding at a different time than the other, or one group may live on a different type of food.

You've written about how particular features of a species can be maintained over very long stretches of Evolutionary time : Often a beak continues to resemble the same type of beak over millions of years. is that because selection never truly works on single individuals, but always on populations with a wide and undefinable Genetic base?

Selection does work on individuals, but the effect can only be manifested in the group. It's always a statistical phenomenon. In the conventional theory you argue that those organisms that fortuitously vary in a locally adapted direction will leave more surviving offspring, so the population moves in that direction. The reason why most species show stability is that these changes are just little jiggles in the fullness of geological time. Most of these little fluctuations are very rapid and local and likely to move back and forth, rotating around small

changes. Or you may find ten or fifteen little local populations within a species, with one of them changing one way, another changing another way. Those are all transient little blips and flips. The local population, unless it can achieve isolation and become a separate species, is just sitting out there. But the claim that most species are stable is an empirical one. It is not predictable *a priori*. In fact, most people construe Darwinian theories as expecting the opposite, whereas either result is consistent with basic Darwinian logic. Empirically, it looks as though the vast majority of species are stable for millions of years, by which mean they fluctuate back and forth – but when they die millions of years after their origin they don't look all that different from when they began.

Suppose that I propose two competing Hypotheses. One is that the "Classical", Oversimplified Concept of Natural Selection – in which the fate of a species Depended on one single trait – has only Happened 1,500 times over history. The Alternative is that it has happened one Time for every existing Gene in Any Existing Genome on Earth at some point in its Evolutionary history. "If we have Long Eyelashes, then Eyelash Length Must have made a survival Difference at Some point in some Environment." How can we arbitrate between these two Standpoints?

I'm not sure you can always resolve specific questions about the historical value of a particular trait, unless you could recover direct evidence; in this case, I don't think you can – because you don't find eyelashes in the fossil record. However, certain inferences can be made. You can study the genetics of eyelash length in humans today. You might find, for example, that there is no genetic variation – in which case the question wouldn't make a lot of sense. You might find that this trait is affected by 50 different genes, at which point the inquiry makes no sense, either. On the other hand, you might find that eyelash length is linked to certain other traits whose significance we understand, or that the trait is determined by one gene that affects nothing else, at which point the inquiry becomes more plausible. But again, that would only give you an indication. I'm not sure that in the absence of detailed historical information, you are going to be able to answer the question.

This is particularly true for certain human traits like language or moral beliefs. We really want to know where these uniquenesses of your own species came from, but these are still questions about historical particulars rather than challenges to the genral theory. We certainly didn't evolve a big brain so that we could read. But think of how central reading this ability to human life today. A lot of what is crucial to our current existence is simply fortuitously coopted from the capacity of brains that got big for other reasons.

At least in theory, I think we can pursue the issue of where some aspects of universal cognitive behaviour come from. I despair at truly answering come key questions, including the origin of language. How are you going to get at this issue? Language isn't fossilized, and to talk about its development during prehistory one is forced to make distant inferences about, for example, the kind of language required for a group of humans to hunt mammals or fashion tools. But you can at least study the mechanics of brain action.

In the stones of Marrakech, you give an Extensive account of the political and Historical context of Galileo's Imprisonment. What got you Hooked on that story?

Galileo's story is so interesting because the canonical version – as a pure conflict between science and religion – is so wrong. I don't have a tremendous revisionary account of this incident; Galileo was the hero, of course, and the Pope's reaction was unjustified. But you

have to realize that Galileo's ordeal unfolded in Rome in the middle of the Thirty-years' war. Catholicism was under attack all over Europe. This was a tough time, and Galileo was a notorious hot-head. He and Urban VIII had been good friends, and the Pope felt betrayed, and not entirely wrongly. Galileo had official permission to write about Copernicanism as long as he treated the theory hypothetically. All he needed to do was write an honest dialogue between a Copernican and a Ptolomean. Instead, Galileo put Ptolomey's arguments into the mouth of a character named Simplicio, whose arguments were as bad as his name. He didn't need to be so provocative to prove his point. The Copernican system would have triumphed even if he had constructed a fair dialogue, because the Copernican arguments were so much better.

Another theme of the book is "Marginalia" – the contents of the Margins of Guettard and Lavoisier's Work on geology, which for the first Time really introduce the idea of Geological strata. Do you have a General Interest in "Margins"?

It is the essayist's fundamental belief that important conclusions flow from tiny, seemingly-insignificant items. To reveal something so apparently insignificant that, at first, it passes beneath everyone's notice.

The Galileo story has the sense of place and time that one finds in really Good Historical fiction. Do you have other Literary aspirations beyond the genre You currently works in?

The only way to convey a story like this is to try to immerse myself into the context. As for other ambitions, I'll do a book about baseball at some point ... But I have no plans to experiment with fiction because I suspect that I could not write dialogue, an essential ingredient of most fiction. It is so important to recognize what you can't do. I love opera and baseball, but I know I could never be an opera star, or the New York Yankees' center fielder. I don't mean that negatively : the key to success lies in understanding the things you can't do. **P A S**

Steven Jay Gould : Understanding Evolution

Q : Why do we humans have a hard time understanding, and sometimes accepting, evolution? What, in your opinion, is the major stumbling block?

A : Deep time is hard to grasp. I don't know that it or any one thing could be called "the" major stumbling block. The major stumbling block is that we're not quite ready, because we live in a veil of tears, and we know that bad things happen to good people. We're still desperate, many of us, to find factual answers out there that would makes us feel better in a psychological sense about some of the cruel things that don't make sense in life. And that's a very hard one to get through, I think. Once you come to terms with the recognition that the answers to moral questions aren't out there in nature, and you shouldn't be seeking them there, you have to seek them inside yourself – and that is the proper role of religion and humanities – then it ceases to worry. But it does worry many people.

And since it does, there are a whole set of issues that then become very hard to accept, one of which is that most organisms are bacteria. And there isn't a linear progressive pattern that pervades evolution leading up to humans. Another is that humans are a tiny little twig representing one species among so many millions on this enormous arborescent tree of life. And a third is what we're talking about now, that this tiny little twig of *Homo sapiens* represents an eye blink of geological immensity.

I think they all go together, and they all represent our unwillingness to give up on the notion that there is meaning out there expressed in human terms, which is a kind of ultimate hubris. I don't deny that there's meaning out there that we have to find. But to think that the meaning of this immense complexity and variety of life should be framed only in terms of one funny little primate species ... to think that it all exists because of us, or that its meaning is framed in terms of us, that's an ultimate kind of arrogance that I think is most unlike to be correct in any sense.

Q : How does Darwin's theory rank among the great scientific discoveries of all time?

A : Sigmund Freud made a famous and often repeated comment that the few truly great revolutions in the history of science all have the common property that they not only reform our concept of the physical universe – which obviously they do or we wouldn't call them revolutions – but that they also ironically knock human arrogance off one pedestal after another of our previous beliefs and our own self importance. And clearly, that's where Darwin ranks so highly.

Freud said that there were really two great revolutions. The first that we associate with Copernicus, Newton, and Galileo that taught us that we weren't living on the central body of a limited universe. And that Darwin's was the second that taught us that we were not separately created in the image of a benevolent deity, but were part of a history of genealogical connectivity of all living things.

Now, in an odd sense, know how contentious the first revolution was; we know the story of Galileo. But contrary to popular understanding, the church made its peace with Galileo. They may not have taken his books off the index or officially exonerated him until recently. But a few years after his death it was not a hot issue anymore because people knew the earth goes around the sun, and that's all there was to it. And it wasn't going to do much good to try and base a theology on getting nature backwards.

But the way I like to put it, I don't think that revolution was as important as Darwin's, because it's about real estate. The Darwinian revolution is about essence; deeper. The Darwinian revolution is about who we are, it's what we're made of, it's what our life means insofar as science can answer that question. Science cannot answer all aspects of that question. It can't tell us what our life means ethically. It can't tell us what we are meant to do as moral creatures. But insofar as science can understand what we're made of, and what we're related to, the Darwinian revolution completely revised our ideas about who we are, and what we're related to, and how long we've been here, and why we're on this earth – again, in limited ways that science can apprehend or comprehend those questions.

So it, in many ways, was the singularly deepest and most discombobulating of all discoveries that science has ever made. And that it is so factually firm and so well documented merely makes it all the more salient, because it isn't just a conjecture; it's an entire reconstruction of our concept of ourselves and who we are that is as well documented as anything we've ever learned in science. So that does give the Darwinian revolution a unique status.

But, again, we shouldn't take it too far. Science, as any enterprise, has a limited frame. Science is an enterprise that deals with the factual world works as it does, and not some other way in which it might work. That's roughly fact and theory, but there are many questions about human life and human nature that science can't answer. Science can't answer ethical ques-

tions. Science can't answer questions about meaning in the spiritual or theological sense. And we shouldn't pretend that it can.

Q : Can you talk about evolution as an amoral process?

A : I don't think there's moral messages of any kind in nature. The most you can get out of nature is an understanding of how the world operates, which is certainly material you want to factor into any moral debate you're going to have. It's not going to answer moral questions for you.

All that happens in evolution, at least under Darwinian natural selection, is that organisms are struggling in some metaphorical and unconscious sense for differential reproductive success, however it happens. Some succeed; most fail and die. Some succeed by things we don't happen to like, like killing others. Some succeed in it by things we do like, such as cooperation. And others succeed by inflicting enormous pain and harm upon others, including human being. So we don't like it. But it has uniquely in the Western world, I might add – there is a politically motivated bunch of folks out there who have a certain amount of local power, even though they keep losing court cases, who for their own political reasons are trying to push anti-evolutionism.

But putting that aside – which has very little to do with the content of science, though it's an interesting sociopolitical issue in American history – I don't know what to say, except that as a factual proposition, evolution is about as well-documented as anything we know very broadly in science; that there is a tree of life, that all organisms are tied by genealogical connectivity, that the history of life is, to use Darwin's words, "descent with modification." I would say that's as well known as that the earth goes around the sun, and not vice-versa.

Now there are all number of details that we don't know, because you're dealing with an enormously complex narrative history of life that often doesn't leave evidence of particular highways and byways. Just as I can't give you a list of every soldier who fought at the Battle of Marathon, but I don't doubt there was such a battle, I can't tell you every species of brachiopod that died out in the Permian extinction, but I can be pretty confident that large numbers of them did.

So I think we're very confident about the basic factuality of evolution. But there's so much we don't know about particulars of detailed pathways, and there's a lot we need to learn about mechanisms. But that's true of all science. Science is a continually self-correcting enterprise that doesn't always move triumphantly forward, but somehow works its way to a better understanding of a pretty complex factual reality out there.

Q: How much do we owe who we are today, our bodies and our beings, to the 4 billion year history of environments and environmental change?

A : Evolution is the only process behind the construction of our bodies, in a biological sense. Clearly all the sciences are involved. The periodic table explains the elements that we're made out of. Physics gets to the particles. But if you want to talk about the history of life, that subject is evolution, the distinctive characteristics of this one funny little primate species that is us, or a function of that history. So evolutionary biology is the right subject to consult.

We're basically a pretty ordinary mammal, with one absolutely stunningly remarkable and powerful invention – what we call, for better or worse, "consciousness." But it's important not to mistake the power of that invention, which is undoubted – I don't think anything else has

ever happened in the history of evolution that has so quickly given one funny little species such power over a planet or over other living things. But you mustn't confuse the impact of something with its fundamental misery. It still remains an aspect of evolutionary history that consciousness enables us to do all sorts of things that were not anticipated or not part of the actual reason why it all happened. It just adds to the interest. But there it is.

Q : How do you help students understand the importance of the earth's history and changing environments to evolution?

A : The basic theory of natural selection talks not about nothing to do with nature's ways. If bacterium or a virus gains differential reproduction success by making us sick and exploiting our bodies, then so be it.

Q : How can chance mutations result in adaptations that seem to be purposefully designed?

A : It's a common phrase that natural selection is chance and necessity. It goes back to the title of a book by the great French biologist Jacques Monod. But it's not really correct, because the chance part is not natural selection. Natural selection is actually a locally deterministic force.

If you want to say the Darwinian evolution has a component of chance, and a component of local necessity, that's quite accurate. But the basic argument goes like this : Because natural selection doesn't make anything, natural selection is an eliminative force. Natural selection can only differentially preserve certain variations in a spectrum of variation within a species. Now some other process produces that variation; ultimately it's mutation. And mutation is spread around through recombination and sexual organisms.

But because the causes of genetic mutation are occurring at the level of the gene, and bear no reference to the adaptive design of organisms, the variation among the organisms produced by mutation bears no relationship to what's for the good of organisms. So it's not random in the mathematical sense of flipping a coin and getting 50-50 [chance]. All we mean is that the variation which provides the fuel for natural selection occurs without reference to those characteristics that would be useful for an organism.

For example, if you have a bunch of elephants living in Siberia, and it's getting cold because there's an ice sheet advancing, there's going to be another Ice Age, you're going to have elephants with different amounts of hair on their bodies. But there isn't any internal force that produces more hair because that would be a good thing. You just have variation among these different elephants, and that's what we call random with respect to the direction of natural selection. And then you have the second force, which is natural selection, which is not necessity or determinism on a global scale. Natural selection doesn't make overall more progressive or better organisms; natural selection makes locally adapted organisms.

If you go back to that analogy, if you have a bunch of elephants and it's getting colder, on average, – this is statistical phenomenon, not every time. After all, the hairiest elephant can fall into a crevasse and die or be sterile and have no kids. But it's statistical phenomenon that elephants with more hair are going to leave more surviving offspring. And that's natural selection.

Q : Do scientists and the lay public sometimes misunderstand each other around evolution as conjecture, or around how much is really known?

A : Scientists and the lay public often misunderstand each other in the same sense that people who have deep technical knowledge about any subject tend not to talk about it very

well to lay people. They often get into confusions. But I don't know that it's any worse for science than for others. There is obviously a particular context, because in the United States – predictable universal progress, or any inherent direction of evolution. It's only a theory of adaptation to changing local environments. That's really all it is. The parasite that becomes morphologically simplified, living inside the body of its host, is as well adapted to its environment as the complex bird flying through the air. That's all it is: a theory of adaptation to changing local environments.

Now because the history of the earth, its four-and-a-half billion years, is a story of environmental change – a story of mountains building and seas moving in and out, and ice ages coming and going – the story of life history, insofar as it's regulated by natural history, is a constant interplay and dance back and forth. Environments change; creatures change to match those environments.

It's not an automatic, mechanical process. Because by environment we just don't mean it gets colder and an animal gets hair. Environment is a complex construction that includes the other organisms that share it with you. When you adapt to your environment, that environment isn't only the climate and the mountains and the oceans; it's also the other organisms in that world.

In the same sense that human history is wonderfully complex and unpredictable, because you never know when the next river is going to break through, the next army is going to invade, the history of life is the same way. It's a constant process of adaptation by natural selection to changing local environments. And the vector of those environmental changes through time is effectively random. That makes the history of life itself unpredictable, but still eminently documentable. **P A S**

Heinrich Heine

Buch Der Lieder: Lyrisches Intermezzo: 'Ich glaub nicht an den Himmel'

I don't believe in Heaven,
Whose peace the preacher cites:
I only trust your eyes now,
They're my heavenly lights.

I don't believe in God above,
Who gets the preacher's nod:
I only trust your heart now,
And have no other god.

I don't believe in Devils,
In hell or hell's black art:
I only trust your eyes now,
And your devil's heart.

The Social Functions of Literature

D. D. Kosambi

Poetry, along with music, dancing, painting, and sculpture, is older than civilization, much older than writing. Sanskrit poetry of all periods was accompanied by the preliterate emphasis on sound and memory, without being itself primitive. The ritual-magic functions of primitive art forms by no means disappear with the rise of urban civilization and the art of writing. Thus, for example, we have the glyptic of ancient Mesopotamia and Mohenjo-daro which used cultic taboos to seal merchandise. Sanskrit never lost its ritualistic basis or religious stamp.

The analysis must therefore derive from the class divisions of every society in which literature was cultivated. The professional writer before the machine age was a member of the leisure class, which in turn includes and is appended (as is the priesthood) to the ruling class. Hence literature may be viewed in two aspects. The first would be as a closed preserve of the class in power, private literature not accessible to the common herd. This is typical of all Sanskrit, so that its patronage may be called (following Thorstein Veblen) a method of conspicuous consumption. At its broadest, this type of writing marks the unity of the upper classes, as the Sanskrit language unmistakably did till A.D. 1200. There is secondly the broader literature which serves all society; this too becomes saturated with the ideas of the ruling class, taking on the appearance of a tool for domination. But the development and technique have to be different here. The theme or approach must be traditionally familiar to the people at large, accepted by society as a whole, thus suitable for embroidery with special class glorification. That society has progressed by the development of successive classes to positions of dominance implies that the progressive writer is oriented towards the needs of some rising class; his greatness derives from the inevitable tendency of the class to look upon the interests of all humanity as its own. It is a corollary that the great writers come far oftener at the beginning of their period than at any later stage; they are the ones whose appeal outlasts their times and society. This is why we do not dismiss great writing because it is class literature. When the class in question has gained power, there follows a neat inversion whereby its own special interests are proclaimed to be those of all humanity. Then writers set themselves in a far narrower mold.

The *subhasita* literature that concerns us here could not reach the people, so its class interests remain unmistakable. The hold upon society was indirect, through the religion and ritual preserved in Sanskrit. A class structure is maintained ultimately by force, but strong religious belief minimizes the need for violence in its maintenance. Belief in common gods and the inevitability of caste was one of the bonds that formed a coherent society of many producers subject to the few. Associated with the nobility in sharing the surplus as well as ensuring its expropriation were the priests in temples and monasteries, no less than the armed feudal retainers. The very absence of the heroic lay implies stronger religious bonds. Religious conventions would have been patently hollow and ineffective had they not been as sincerely adopted by the ruling class as their amatory conventions. Poet and priest were brothers in fact

and in deed; sex and religion went together.

It follows also that new types of literature cannot be expected without the rise of new classes. The English reformation under Henry VIII shows the unmistakable beginning of such a new class, along with that of new literature. Even for the Elizabethan age, only the authors that look forward with the new gentry attain permanence, as, for example, dramatists like Marlowe and Shakespeare who did not scorn to display their wares to the London theatre audiences, or the keen-witted John Donne; the authors who looked backwards to the court and its entourage wrote with no less skill, effort, mastery of words, but the *Faerie Queene* and Lyly's *Euphues* seem comparatively insipid. In India, the new literature had to await the passage of centuries, till the great social novels in Bengal with Bankim Chandra Chatterji, matched by those of Rabindranath Tagore whose incomparable poetry speaks of completely new social aspirations. The social drama in Marathi hardly antedates the First World War. I am not qualified to speak in detail of contemporary Indian literature, but it will be admitted that these vigorous manifestations had been preceded by centuries of dreary classical imitation, even in the vernaculars. To those who could write, the ten-headed Ravana had remained more real than their living human neighbors, the woes of the Pandavas indistinguishable from their own. Foreign conquest explains nothing, for where is the corresponding influence of Persian, though that had become a court language all over the country, to be cultivated by learned Hindu. The *Fisana Ajayab* and *Bagh-o-Bahar* might as well have been written at the time of the Arabian Nights. The difference is that the British introduced a fundamentally new, advanced mode of life, the bourgeois, as against Muslim feudalism which had meant a comparatively trifling readjustment of the way in which people lived. With Ghalib come new problems and new writing. The verse of Akbar Allahabadi shows what life nationalism could infuse; Mohammed Iqbal's great days gave us an Urdu poem that became a national song, his words *Hindustan hamara hai* stirring every person who heard them – except the British. Yet this is unmistakably class literature. Munshi Premchand has many admirers, but no worthy successor, though the modern Urdu and Hindi short story begins with him. Iqbal's later years showed higher Persianization, greater introspective detachment from the problems of the country, and a British knighthood! Competent writers increase, but the framework is now set, foreign models cheap and easy to imitate, profoundly original writing unnecessary as well as uneconomical, "progressive" writing no less imitative, though more dangerous and liable to be suppressed by police action.

For that matter, it is not possible to view modern literary development in the West with equanimity or pleasure. The tradition may be roughly classified as that of love and prowess, just as the Sanskrit mode was love and religion. For historical reasons, violence left an indelible mark on the writing, and was turned to good use by the ruling classes. The Anglo-Saxon thanes who heard *Beowulf* recited killed no monsters; no medieval knight quested after the grail. Yet it is clear that both classes derived some justification for their use of force against their fellow men from the reflected glory of their supposed ancestors. The right way to destroy any monsters that might exist is the mass action of African Masi, killing lions with assegai and shield. It was the modern bourgeois policeman who rescued damsels from distress without distinction between noble and seft. The detective story follows the knightly formula with fundamentally sound instinct, but hardly seems literature even when written by a master of plot and prose like G. K. Chesterton. The emphasis is increasingly on pure sadistic violence

after a brief period of neo-Freudian literary sexual license. The conclusion seems to me inescapable that the class which mass-produces such writing is moving towards some crisis even more violent than that whose shadow remains in theological Sanskrit. This cannot be for lack of range, for Jules Verne and H.G. Wells showed what brave new worlds opened out to the imagination based upon modern technology and science. Yet science fiction has never risen above these pioneers.

There is plenty of rough obscenity in Rabelais, but we know what dangerous opposition he faced. His work still ranks high in world literature as the general *sringara* epigram does not. If the Sanskrit poet had been conscious of his failings, which were those of his society, there would at least have been powerful satire, of which no example is to be seen except perhaps ridiculous exaggeration. Pulci's *Morgante*, Folengo's *Maccaronicon* lead to the residual masterpiece, *Don Quixote*. The disillusionment of the First World War gave us a corresponding literary figure for modern times, J. Hasek's *Good Soldier Schweik*. It cannot be the traditional past that inhibited Sanskrit epigrams of this type. Deor laments the sudden disfavor of his lord, a theme quite familiar to the Sanskrit poet. The Anglo-Saxon minstrel, in rougher language and heavier rhythm, consoles himself with the tradition of distress borne patiently by others before him in worse situations. He shares their woe in his song, they relieve his misery and ours by their example. Villon's classical studies were weak, but the strophes preceding his refrain "Mais ou sont les neiges d'antan?" show a depth of feeling for bygone love and loveliness that rises above a formal *mahakavya*. The late Sanskrit poet could not attack the foundation of his own being, for he was attached to society by the slender thread which dangled him from a particular decadent class. He might on occasion have realized that the small recognition for which he strove could endure as little as the spring mist after sunrise. Did he never, as a young wanderer, tread some verdant and springy trail that would through unknown country into the red glory of the great sun-disc poised on the horizon – thinking to himself, "may this symbolize the course of my life"; or did the lengthening shadows only make him scurry the faster towards a pitiful shelter within which to cower through the night? There is no doubt that India at all times produced noble spirits who could see the futility of neo-classical writing; but they either took to *vanaprastha* retirement, or to the path of active religion. Neither action produced better Sanskrit literature, because neither affected the foundations of society.

The poetry which we find in our *subhasitas* necessarily carries with the rank beauty of an orchid the corresponding atmosphere of luxury, parasitism, decay. Vidyakara's anthology had a hundred years' run, despite the disturbances following the growth of open conflict between Buddhism and Saivism, before Muslims wiped out vihara and readers. Sridharadasa actually wrote less than five years after the aged Laksmanasena fled from his capital Navadvipa (Nadiya), unable to defend himself in his own palace against a sudden raid by no more than eighteen armed horsemen under Muhammad Bakhtyar. S shows not the slightest consciousness of the debacle, the king being praised as before, the royal verses quoted profusely with the rest. Rupa Gosvamin, a leading disciple of Caitanya, found as little difficulty earlier in serving a Muslim provincial governor in an official capacity as he did later in adopting erotic verses (in his Padyavali) to the eternal divine love of Radha and Krsna. Hardly a generation passed between the publication of Jalhana's Suktimuktavali and the ruinous attack of Alauddin. In spite of it all, brahminism continued its concentration upon theology and pursuit of obsolete philosophical doctrine in stubborn ignorance of reality. One could say that their world had

become one of "doublethink," that they continued "to hold simultaneously two opinions which cancelled out ... to use logic against logic."³⁹ One could even accuse them of mass-producing verses mechanically, for there exist standard poet's companions giving stock phrases to fit any meter. But they had little choice in the matter, having once started on the wrong path.

The best chances for literary survival are in the front rank of the constant struggle. Bunyan's valiant pilgrim fights his way to salvation, saying "yet now I do not repent me ... My sword I give to him who shall succeed me in my pilgrimage, and my courage and skill to him who can get it. My marks and scars I carry with me, to be my witness that I have fought his battles who now will be my rewarder." For him, death had no sting, over him the grave could claim no victory; the trumpets sounded for him on the other side as they never could for the florid Sanskrit poet or his hedonist patron. I do not recall a single *subhasita* in the following vein:

Bring me my bow of burning gold!
 Bring me my arrows of desire!
 Bring me my spear! O clouds unfold!
 Bring me my chariot of fire!
 I will not cease from mental fight,
 Nor shall my sword sleep in my hand,
 Till we have built Jerusalem
 In England's green and pleasant land.

This is the best of all possible warfare, the only one for a poet. Blake's fight made his own life miserable while making his poetry great; even if the dark, satanic mills against which he fought did not exist in Vidyakara's day, there were other even darker and more satanic objects for a struggle which the poets had renounced, exchanging doubtful comfort for their share of immortality.

If these authors dealt with no major problem of the individual spirit, if they strove neither to burn with a hard gem-like flame nor to free humanity from any of the shackles man has imposed upon himself in making his own history, time has exacted full penalty for the failure. Most of their works and all their biography have been gathered to an oblivion that makes future restoration extremely doubtful. The poetry strives to be and is, at best, exquisite rather than great. Yet, though the voice be thin, it is clear. The field might be limited as to objectives, vision, or endeavor, but excess is rare. The poets speak across the centuries in refined musical tones bearing a soft but indelible charm, visualising an elegant life. The dominant ideal, frankly expressed, is tasteful though not placid lovemaking in luxury – with out vice, greed, brutal lust after blood, bourgeois concentration upon money-breeding profit. It is only fitting that their names and verses should not be altogether forgotten.

(Extracted from the Introduction in *The Subhasitaratnakosa* compiled by Vidyakara, edited by D.D. Kosambi and V.V. Gokhale, Cambridge, Massachusetts; Harvard University Press, 1957, pp. I-Vii-Ixii **P A S**)

Question and Answer

Madhumita Saha from Behala, Kolkata has written, I am a working mother. I am hearing such complaints from a lot of people that the children of the working mothers don't become men. Some of my colleagues have been through this very experience and I have a son, I am also suffering from different problems related to him. I don't understand what to do. Yet I can't even imagine of quitting my job. It would be convenient for me if I get your consultation in this matter.

First of all, I should say that it's a very difficult job to answer your questions briefly. I'm not trying to do so. Because each of you has problems which are equally common and special at the same time. Therefore it's possible to provide a few general suggestions to your problem only after appropriately knowing what kind of problem you are suffering from. However it must be said that you share your problem with a lot of other people and also with all of us who work on this subject. But we also know that, there is nothing like the foolishness of giving any quick answer to these problems. So I consider it to be sensible to say something in general.

All over the world the human beings and the families are continuing their effort to become modern citizens as a result of the Industrial Revolution. Due to various reasons at present the families have become smaller and in the female quarters a small portion of the women, who go through the drudgery like the oilma's blind-folded buttock, has won freedom, although partially. As a result of this very incident, the veiled faces at the corner of the room having more or less put down the conventional duties of the family or the yoke from their shoulders inside the house, are taking up the yokes from the outside world. This change is inevitable therefore it's useless to judge it from the viewpoint of what is just or unjust. We can at most have discussions in this matter about the advantageous and disadvantageous aspects of it. In this context we've to remember that, one of the institutions which are still surviving in an unimpaired state during the last five thousand years of the human civilization, is the 'family'. So it can be understood that, whatever situation that may befall on the society if the families break down, is still beyond our imagination or perception.

We would get to notice that, among several other changes in the family, two issues have remarkably influenced as a result of women going out, one is the inter-relation between a man and a woman and the other is the conservation of the species. Certainly there is a complicated inter-relation among these issues. Therefore it's neither possible nor sensible to consider any one of them separately. Yet, here we would say something about the matter of conservation of the species or the bringing up of the children.

In the worldly affairs, mainly the mothers have been doing and still do the job of bringing up the children. In most of the cases this role of the women folk is still considered to be extremely important. So there is no need to make one understand that the impact of the women working outside would certainly affect the children. But can never say, because of this reason that, the women would not work. In lieu of it we have to take care how we can compensate this effect on the children.

During the years of growing up, the not-related servants, the relatives specially the grand-

parents and partially the father make up for this need of a child for having a mother. But it's never possible to think or tell in advance how far this compensation would be possible. However this process has to be done with an wonderful understanding otherwise the entire arrangement is sure to end in a fiasco. That is, each family has it's own kind of study of life and these issues should take place accordingly. Otherwise different problems regarding the children would arise regularly in our worldly affairs and this would affect the children. Then everyday would accuse the mother alone.

Therefore, which family is taking what measure in order to keep their children safe and secure, is an extremely private and mutual understanding of the couple and which is almost impossible to understand or make others understand from outside. At most it's possible to give a few general suggestions with caution in this matter. Due to this reason it can be said that there is no such expert in the world who can solve these problems. The couples alone can solve these problems of yours. The experts can only provide a few general suggestions after knowing the entire situation.

But we have to admit that our society is male-dominated. Therefore if the husband of a woman wants to help his wife sincerely in this matter and has appropriate understanding with his wife, he can help here the most. That's why we majorly emphasize on the mutual understanding between the couple. In the present abundantly-changed times, if a man fails to understand this matter, if he appears to be obstinate and arrogant and habituated of playing the role of the father or uncle of the past generations, it becomes almost impossible for not only the working women but also all of them to run the worldly affairs these days. Certainly it's not so that the women always act on the right decision; but it becomes impossible for her to direct the worldly affairs if she does not get company from the man. And it's needless to say that, the men, as a special opportunist class in the family, have to become more tolerant and compassionate today.

Certainly the meaning of this discussion is not such that problems arise or would arise in case of the growth and development of the children of all working mothers. But the possibility of problems concerning the growth and development of the children of the working mothers, getting formed is much greater. Therefore if any couple wishes that both of them would go out to earn money, they would certainly have to take extra measure for bringing up their children. They themselves would decide how they would do that. It's better not to think that they would work outside being rest assured and keeping the children with the in-laws at home. That is, they have to remain prepared for any situation due to this special change, until the children become rational and self-dependant in the matter of managing themselves. Naturally they would take refuge to the specialists if they face the derth of intelligence in this matter. However, in spite of all these, it can not be said that one would not face problems with the children. Because there are certain problems which are eternal i.e. the children and adolescents of every age face them. Perhaps these problems might appear in a dreadful form in case of the children of the working mothers. **P A S**

Asok Bandyopadhyay Passes Away

Asok Bandyopadhyay (1950-2008), editor of *Utsa Manush*, has passed away on 17 November, 2008 at 6:30 p.m. in Kolkata. He was 58 and is survived by his wife and daughter.

Asok Bandyopadhyay was a product of Hindu School, Maulana Azad College and the Calcutta University. Post-graduating from the Calcutta University in Physics, he actively took part in the science movement in the 1970's. For a time he worked at the Calcutta Station of All India Radio as a science programmer. In 1980 he, along with a group of dedicated friends, founded *Manush*, a Bengali popular science journal devoted to promoting science awareness and combatting superstition and pseudo-science. *Manush* ultimately evolved into *Utsa Manush* in 1982, which has, for more than two decades, been giving yeoman's service to the cause of spreading scientific ideas and facts among common persons. In the process *Utsa Manush* developed a unique style of presentation, free from pedantry and jargons and hitting the bull's eye directly every time.

His whole life was devoted to the cause of building up a science-honed, value-based humanism. The role of *Utsa Manush* will be ever remembered for its uncompromising fight not only against miracles, paranormal hoaxes of godpersons, astrological swindling and false medical claims, but also against political charlatantry parading itself as friends of the people.

Asok has long been a patient of cardio-myopathy. This, coupled with the fact that he worked very long hours for the paper, often against medical advice, ultimately took its toll. He died of multiple organ-failure and septicaemia.

With his death, the popular science movement in West Bengal has received a severe jolt. His friends and comrades remembered him on 22 November, 2008 at Boi-Chitra, the cultural centre of which he had been the heart and soul.

Psyche and Society salutes him for his contribution towards developing a clean scientific ethos among the people.

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I declare that the above statement is best of my knowledge

Sd/-
(Goutam Banerjee)