**Modern dialectical materialism**

**(essay)**

**Introduction**

We are living in a period of profound historical change. After a period of 40 years of unprecedented economic growth, the market economy is reaching its limits. At the dawn of capitalism, despite its barbarous crimes, it revolutionized the productive forces, thus laying the basis for a new system of society. The First World War and the Russian Revolution signalled a decisive change in the historical role of capitalism. From a means of developing the productive forces, it became transformed into a gigantic fetter upon economic and social development. The period of upswing in the West in the period of 1948-73 seemed to promise a new dawn. Even so, the benefits were limited to a handful of developed capitalist countries. For two-thirds of humanity living in the Third World, the picture was one of mass unemployment, poverty, wars and exploitation on an unprecedented scale. This period of capitalism ended with the so-called "oil crisis" of 1973-4. Since then, they have not managed to get back to the kind of growth and levels of employment they had achieved in the post-war period.

A social system in a state of irreversible decline expresses itself in cultural decay. This is reflected in a hundred different ways. A general mood of anxiety and pessimism as regards the future spreads, especially among the intelligentsia. Those who yesterday talked confidently about the inevitability of human progress and evolution, now see only darkness and uncertainty. The 20th century is staggering to a close, having witnessed two terrible world wars, economic collapse and the nightmare of fascism in the period between the wars. These were already a stern warning that the progressive phase of capitalism was past.

The crisis of capitalism pervades all levels of life. It is not merely an economic phenomenon. It is reflected in speculation and corruption, drug abuse, violence, all-pervasive egotism and indifference to the suffering of others, the breakdown of the bourgeois family, the crisis of bourgeois morality, culture and philosophy. How could it be otherwise? One of the symptoms of a social system in crisis is that the ruling class increasingly feels itself to be a fetter on the development of society.

Marx pointed out that the ruling ideas of any society are the ideas of the ruling class. In its heyday, the bourgeoisie not only played a progressive role in pushing back the frontiers of civilisation, but was well aware of the fact. Now the strategists of capital are seized with pessimism. They are the representatives of an historically doomed system, but cannot reconcile themselves to the fact. This central contradiction is the decisive factor which sets its imprint upon the mode of thinking of the bourgeoisie today. Lenin once said that a man on the edge of a cliff does not reason.

**Lag in Consciousness**

Contrary to the prejudice of philosophical idealism, human consciousness in general is extraordinarily conservative, and always tends to lag far behind the development of society, technology and the productive forces. Habit, routine, and tradition, to use a phrase of Marx, weigh like an Alp on the minds of men and women, who, in "normal" historical periods cling stubbornly to the well-trodden paths, from an instinct of self-preservation, the roots of which lie in the remote past of the species. Only in exceptional periods of history, when the social and moral order begin to crack under the strain of intolerable pressures do the mass of people start to question the world into which they have been born, and to doubt the beliefs and prejudices of a lifetime.

Such a period was the epoch of the birth of capitalism, heralded by the great cultural re-awakening and spiritual regeneration of Europe after its lengthy winter sleep under feudalism. In the period of its historical ascent, the bourgeoisie played a most progressive role, not only in developing the productive forces, and thereby mightily expanding humanity’s power over nature, but also in extending the frontiers of science, knowledge and culture. Luther, Michelangelo, Leonardo, Dührer, Bacon, Kepler, Galileo and a host of other pathfinders of civilisation shine like a galaxy illuminating the broad highroad of human cultural and scientific advance opened by the Reformation and Renaissance. However, such revolutionary periods do not come into being easily or automatically. The price of progress is struggle—the struggle of the new against the old, the living against the dead, the future against the past.

The rise of the bourgeoisie in Italy, Holland, England and later in France was accompanied by an extraordinary flourishing of culture, art and science. One would have to look back to ancient Athens to find a precedent for this. Particularly in those countries where the bourgeois revolution triumphed in the 17th and 18th centuries, the development of the forces of production and technology was accompanied by a parallel development of science and thought, which drastically undermined the ideological domination of the Church.

In France, the classical country of the bourgeois revolution in its political expression, the bourgeoisie in 1789-93 carried out its revolution under the banner of Reason. Long before it toppled the formidable walls of the Bastille, it was necessary to overthrow the invisible but no less formidable walls of religious superstition in the minds of men and women. In its revolutionary youth the French bourgeoisie was rationalist and atheist. Only after installing themselves in power did the men of property, finding themselves confronted by a new revolutionary class, jettison the ideological baggage of their youth.

Not long ago France celebrated the two hundredth anniversary of its great revolution. It was curious to note how even the memory of a revolution two centuries ago fills the establishment with unease. The attitude of the French ruling class to their own revolution vividly recalled that of an old libertine who tries to gain a ticket to respectability—and perhaps admittance to heaven—by renouncing the sins of his youth which he is no longer in a position to repeat. Like all established privileged classes, the capitalist class seeks to justify its existence, not only to society at large, but to itself. In its search for ideological points of support, which would tend to justify the status quo and sanctify existing social relations, they rapidly rediscovered the enchantments of Mother Church, particularly after the mortal terror they experienced at the time of the Paris Commune. The church of Sacré Coeur is a concrete expression of the bourgeois’ fear of revolution translated into the language of architectural philistinism.

Marx (1818-83) and Engels (1820-95) explained that the fundamental driving force of all human progress is the development of the productive forces—industry, agriculture, science and technique. This is a truly great theoretical generalisation without which it is impossible to understand the movement of human history in general. However, it does not mean, as dishonest or ignorant detractors of Marxism have attempted to show, that Marx "reduces everything to economics." Dialectical and historical materialism takes full account of phenomena such as religion, art, science, morality, law, politics, tradition, national characteristics and all the other manifold manifestations of human consciousness. But not only that. It shows their real content and how they relate to the actual development of society, which in the last analysis clearly depends upon its capacity to reproduce and expand the material conditions for its existence. On this subject, Engels wrote the following:

"According to the materialist conception of history, the ultimately determining element in history is the production and reproduction of real life. More than this neither Marx nor I have ever asserted. Hence, if someone twists this into saying that the economic element is the only determining one, he transforms that position into a meaningless, abstract, senseless phrase. The economic situation is the basis, but the various elements of the superstructure—political forms of the class struggle and its results, to wit: constitutions established by victorious classes after a successful battle, etc., judicial forms, and the reflexes of all these actual struggles in the brains of the participants, political, juristic, philosophical theories, religious views and their further development into systems of dogmas also exercise their influence upon the course of the historical struggles, and in many cases predominate in determining their form." *(1)*

The affirmation of historical materialism that, in general, human consciousness tends to lag behind the development of the productive forces seems paradoxical to some. Yet it is graphically expressed in all kinds of ways in the United States where the achievements of science have reached their highest level. The constant advance of technology is the prior condition for bringing about the real emancipation of men and women, through the establishment of a rational socioeconomic system, in which human beings exercise conscious control over their lives and environment. Here, however, the contrast between the rapid development of science and technology and the extraordinary lag in human thinking presents itself in its most glaring form.

In the USA nine persons out of ten believe in the existence of a supreme being, and seven out of ten in a life after death. When the first American astronaut who succeeded in circumnavigating the world in a spacecraft was asked to broadcast a message to the inhabitants of the earth, he made a significant choice. Out of the whole of world literature, he chose the first sentence of the book of Genesis: "In the beginning, God created heaven and the earth." This man, sitting in his space ship, a product of the most advanced technology ever seen, had his mind full to the brim with superstitions and phantoms handed down with little change from the primeval past.

Seventy years ago, in the notorious "monkey trial" of 1925, a teacher called John Scopes was found guilty of teaching the theory of evolution, in contravention of the laws of the state of Tennessee. The trial actually upheld the state’s anti-evolution laws, which were not abolished until 1968, when the US Supreme Court ruled that the teaching of creation theories was a violation of the constitutional ban on the teaching of religion in state schools. Since then, the creationists changed their tactics, trying to turn creationism into a "science." In this, they have the support, not only of a wide layer of public opinion, but of not a few scientists, who are prepared to place their services at the disposal of religion in its most crude and obscurantist form.

In 1981 American scientists, making use of Kepler’s laws of planetary motion, launched a spacecraft that made a spectacular rendezvous with Saturn. In the same year an American judge had to declare unconstitutional a law passed in the state of Arkansas which imposed on schools the obligation to treat so-called "creation-science" on equal terms with the theory of evolution. Among other things, the creationists demanded the recognition of Noah’s flood as a primary geological agent. In the course of the trial, witnesses for the defence expressed fervent belief in Satan and the possibility that life was brought to earth in meteorites, the variety of species being explained by a kind of meteoric shuttle-service! At the trial, Mr. N. K. Wickremasinge of the University of Wales was quoted as saying that insects might be more intelligent than humans, although "they’re not letting on…because things are going so well for them." (2)

The religious fundamentalist lobby in the USA has mass support, access to unlimited funds, and the backing of congressmen. Evangelical crooks make fortunes out of radio stations with a following of millions. The fact that in the last decade of the 20th century there are a large number of educated men and women—including scientists—in the most technologically advanced country the world has ever known who are prepared to fight for the idea that the book of Genesis is literally true, that the universe was created in six days about 6,000 years ago, is, in itself, a most remarkable example of the workings of the dialectic.

**"Reason Becomes Unreason"**

The period when the capitalist class stood for a rational world outlook has become a dim memory. In the epoch of the senile decay of capitalism, the earlier processes have been thrown into reverse. In the words of Hegel, "Reason becomes Unreason." It is true that, in the industrialised countries, "official" religion is dying on its feet. The churches are empty and increasingly in crisis. Instead, we see a veritable "Egyptian plague" of peculiar religious sects, accompanied by the flourishing of mysticism and all kinds of superstition. The frightful epidemic of religious fundamentalism—Christian, Jewish, Islamic, Hindu—is a graphic manifestation of the impasse of society. As the new century beckons, we observe the most horrific throwbacks to the Dark Ages.

This phenomenon is not confined to Iran, India and Algeria. In the United States we saw the "Waco massacre," and after that, in Switzerland, the collective suicide of another group of religious fanatics. In other Western countries, we see the uncontrolled spread of religious sects, superstition, astrology and all kinds of irrational tendencies. In France, there are about 36,000 Catholic priests, and over 40,000 professional astrologers who declared their earnings to the taxman. Until recently, Japan appeared to be an exception to the rule. William Rees-Mogg, former editor of the London Times, and arch-Conservative, in his recent book The Great Reckoning, How the World Will Change in the Depression of the 1990s states that: "The revival of religion is something that is happening throughout the world in varying degrees. Japan may be an exception, perhaps because social order has as yet shown no signs of breaking down there…" (3) Rees-Mogg spoke too soon. A couple of years after these lines were written, the horrific gas attack on the Tokyo underground drew the world’s attention to the existence of sizable groups of religious fanatics even in Japan, where the economic crisis has put an end to the long period of full employment and social stability. All these phenomena bear a striking resemblance to what occurred in the period of the decline of the Roman Empire. Let no one object that such things are confined to the fringes of society. Ronald and Nancy Reagan regularly consulted astrologers about all their actions, big and small. Here are a couple of extracts from Donald Regan’s book, For the Record:

"Virtually every major move and decision the Reagans made during my time as White House chief of staff was cleared in advance with a woman in San Francisco who drew up horoscopes to make certain that the planets were in a favourable alignment for the enterprise. Nancy Reagan seemed to have absolute faith in the clairvoyant powers of this woman, who had predicted that ‘something’ bad was going to happen to the president shortly before he was wounded in an assassination attempt in 1981.

"Although I had never met this seer—Mrs. Reagan passed along her prognostications to me after conferring with her on the telephone—she had become such a factor in my work, and in the highest affairs of the state at one point I kept a colour-coded calendar on my desk (numerals highlighted in green ink for ‘good’ days, red for ‘bad’ days, yellow for ‘iffy’ days) as an aid to remember when it was propitious to move the president of the United States from one place to another, or schedule him to speak in public, or commence negotiations with a foreign power.

"Before I came to the White House, Mike Deaver had been the man who integrated the horoscopes of Mrs. Reagan’s into the presidential schedule…It is a measure of his discretion and loyalty that few in the White House knew that Mrs. Reagan was even part of the problem [waiting for schedules]—much less that an astrologer in San Francisco was approving the details of the presidential schedule. Deaver told me that Mrs. Reagan’s dependence on the occult went back at least as far as her husband’s governorship, when she had relied on the advice of the famous Jeane Dixon. Subsequently, she had lost confidence in Dixon’s powers. But the First Lady seemed to have absolute faith in the clairvoyant talents of the woman in San Francisco. Apparently, Deaver had ceased to think there was anything remarkable about this long-established floating seance…To him it was simply one of the little problems in the life of a servant of the great. ‘At least,’ he said, ‘this astrologer is not as kooky as the last one.’"

Astrology was used in the planning of the summit between Reagan and Gorbachev, according to the family soothsayer, but things didn’t go smoothly between the two first ladies because Raisa’s birth date was unknown! The movement in the direction of a "free market economy" in Russia has since bestowed the blessings of capitalist civilisation on that unfortunate country—mass unemployment, social disintegration, prostitution, the mafia, an unprecedented crime wave, drugs and religion. It has recently emerged that Yeltsin himself consults astrologers. In this respect also, the nascent capitalist class in Russia has shown itself to be an apt pupil of its Western role models.

The prevailing sense of disorientation and pessimism finds its reflection in all sorts of ways, not only directly in politics. This all-pervasive irrationality is not an accident. It is the psychological reflection of a world where the destiny of humanity is controlled by terrifying and seemingly invisible forces. Just look at the sudden panic on the stock exchange, with "respectable" men and women scurrying around like ants when their nest is broken open. These periodic spasms causing a herd-like panic are a graphic illustration of capitalist anarchy. And this is what determines the lives of millions of people. We live in the midst of a society in decline. The evidence of decay is present on all sides. Conservative reactionaries bemoan the breakdown of the family and the epidemic of drugs, crime, mindless violence, and the rest. Their only answer is to step up state repression—more police, more prisons, harsher punishments, even genetic investigation of alleged "criminal types." What they cannot or will not see is that these phenomena are the symptoms of the blind alley of the social system which they represent.

These are the defenders of "market forces," the same irrational forces that presently condemn millions of people to unemployment. They are the prophets of "supply-side" economics, which John Galbraith shrewdly defined as the theory that the poor have too much money, and the rich too little. The prevailing "morality" is that of the market place, that is, the morality of the jungle. The wealth of society is concentrated into fewer and fewer hands, despite all the demagogic nonsense about a "property-owning democracy" and "small is beautiful." We are supposed to live in a democracy. Yet a handful of big banks, monopolies, and stock exchange speculators (generally the same people) decide the fate of millions. This tiny minority possesses powerful means of manipulating public opinion. They have a monopoly of the means of communication, the press, radio and television. Then there is the spiritual police—the church, which for generations has taught people to look for salvation in another world.

**Science and the Crisis of Society**

Until quite recently, it appeared that the world of science stood aloof from the general decay of capitalism. The marvels of modern technology conferred colossal prestige upon scientists, who appeared to be endowed with almost magical qualities. The respect enjoyed by the scientific community increased in the same proportion as their theories became increasingly incomprehensible to the majority of even educated people. However, scientists are ordinary mortals who live in the same world as the rest of us. As such, they can be influenced by prevailing ideas, philosophies, politics and prejudices, not to speak of sometimes very substantial material interests.

For a long time it was tacitly assumed that scientists—especially theoretical physicists—were a special sort of people, standing above the common run of humanity, and privy to the mysteries of the universe denied to ordinary mortals. This 20th century myth is well conveyed by the old science-fiction movies, where the earth was always threatened with annihilation by aliens from outer space (in reality, the threat to the future of humankind comes from a source much nearer to home, but that is another story). At the last moment, a man in a white coat always turns up, writes a complicated equation on the blackboard, and the problem is fixed in no time at all.

The truth is rather different. Scientists and other intellectuals are not immune to the general tendencies at work in society. The fact that most of them profess indifference to politics and philosophy only means that they fall prey more easily to the current prejudices which surround them. All too often their ideas can be used to support the most reactionary political positions. This is particularly clear in the field of genetics where a veritable counter-revolution has taken place, particularly in the United States. Allegedly scientific theories are being used to "prove" that criminality is caused, not by social conditions, but by a "criminal gene." Black people are alleged to be disadvantaged, not because of discrimination, but because of their genetic make-up. Similar arguments are used for poor people, single mothers, women, homosexuals, and so on. Of course, such "science" is highly convenient to the Republican dominated Congress intent on ruthlessly cutting welfare.

The present book is about philosophy—more precisely, the philosophy of Marxism, dialectical materialism. It is not the business of philosophy to tell scientists what to think and write, at least when they write about science. But scientists have a habit of expressing opinions about all kinds of things—philosophy, religion, politics. This they are perfectly entitled to do. But when they use what may well be perfectly sound scientific credentials in order to defend extremely unsound and reactionary philosophical views, it is time to put things in their context. These pronouncements do not remain among a handful of professors. They are seized upon by right wing politicians, racists and religious fanatics, who attempt to cover their backsides with pseudo-scientific arguments.

Scientists frequently complain that they are misunderstood. They do not mean to provide ammunition for mystical charlatans and political crooks. That may be so. But in that case, they are guilty of culpable negligence or, at the very least, astounding naivety. On the other hand, those who make use of the erroneous philosophical views of scientists cannot be accused of naivety. They know just where they stand. Rees-Mogg argues that "as the religion of secular consumerism is left behind like a rusting tail fin, sterner religions that involve real moral principles and angry gods will make a comeback. For the first time in centuries, the revelations of science will seem to enhance rather than undermine the spiritual dimension in life." For Rees-Mogg religion is a useful weapon to keep the underprivileged in their place, alongside the police and prison service. He is commendably blunt about it:

"The lower the prospect of upward mobility, the more rational it is for the poor to adopt an anti-scientific, delusional world view. In place of technology, they employ magic. In place of independent investigation, they opt for orthodoxy. Instead of history, they prefer myths. In place of biography, they venerate heroes. And they generally substitute kin-based behavioral allegiances for the impersonal honesty required by the market." (4)

Let us leave aside the unconsciously humorous remark about the "impersonal honesty" of the market-place, and concentrate on the core of his argument. At least Rees-Mogg does not try to conceal his real intentions or his class standpoint. Here we have the utmost frankness from a defender of the establishment. The creation of an under-class of poor, unemployed, mainly black people, living in slums, presents a potentially explosive threat to the existing social order. The poor, fortunately for us, are ignorant. They must be kept in ignorance, and encouraged in their superstitious and religious delusions which we of the "educated classes" naturally do not share! The message, of course, is not new. The same song has been sung by the rich and powerful for centuries. But what is significant is the reference to science, which, as Rees-Mogg indicates, is now regarded for the first time as an important ally of religion.

Recently, theoretical physicist Paul Davies was awarded £650,000 by the Templeton Prize for Progress in Religion, for showing "extraordinary originality" in advancing humankind’s understanding of God or spirituality. Previous winners include Alexander Solzhenitsyn, Mother Teresa, evangelist Billy Graham, and the Watergate burglar-turned-preacher Charles Colson. Davies, author of such books as God and the New Physics, The Mind of God and The Last Three Minutes, insists that he is "not a religious person in the conventional sense" (whatever that might mean), but he maintains that "science offers a surer path to God than religion." (5)

Despite Davies’ ifs and buts, it is clear that he represents a definite trend, which is attempting to inject mysticism and religion into science. This is not an isolated phenomenon. It is becoming all too common, especially in the field of theoretical physics and cosmology, both heavily dependent upon abstract mathematical models which are increasingly seen as a substitute for empirical investigation of the real world. For every conscious peddler of mysticism in this field, there are a hundred conscientious scientists, who would be horrified to be identified with such obscurantism. The only real defense against idealist mysticism, however, is a consciously materialist philosophy—the philosophy of dialectical materialism.

It is the intention of this book to explain the basic ideas of dialectical materialism, first worked out by Marx and Engels, and show their relevance to the modern world, and to science in particular. We do not pretend to be neutral. Just as Rees-Mogg defends the interests of the class he represents, and makes no bones about it, so we openly declare ourselves as the opponents of the so-called "market economy" and all that it stands for. We are active participants in the fight to change society. But before we can change the world, one has to understand it. It is necessary to conduct an implacable struggle against all attempts to confuse the minds of men and women with mystical beliefs which have their origin in the murky prehistory of human thought. Science grew and developed to the degree that it turned its back on the accumulated prejudices of the past. We must stand firm against this attempt to put the clock back four hundred years.

A growing number of scientists are becoming dissatisfied with the present situation, not only in science and education, but in society at large. They see the contradiction between the colossal potential of technology and a world where millions of people live on the border line of starvation. They see the systematic misuse of science in the interest of profit for the big monopolies. And they must be profoundly disturbed by the continuous attempts to dragoon the scientists into the service of religious obscurantism and reactionary social policies. Many of them were repelled by the bureaucratic and totalitarian nature of Stalinism. But the collapse of the Soviet Union has shown that the capitalist alternative is even worse. By their own experience, many scientists will come to the conclusion that the only way out of the social, economic, and cultural impasse is by means of some kind of rational planned society, in which science and technology is put at the disposal of humanity, not private profit. Such a society must be democratic, in the real sense of the word, involving the conscious control and participation of the entire population. Socialism is democratic by its very nature. As Trotsky pointed out "a nationalized planned economy needs democracy, as the human body needs oxygen."

It is not enough to contemplate the problems of the world. It is necessary to change it. First, however, it is necessary to understand the reason why things are as they are. Only the body of ideas worked out by Marx and Engels, and subsequently developed by Lenin and Trotsky can provide us with the adequate means of achieving this understanding. We believe that the most conscious members of the scientific community, through their own work and experience, will come to realize the need for a consistently materialist world outlook. That is offered by dialectical materialism. The recent advances of the theories of chaos and complexity show that an increasing number of scientists are moving in the direction of dialectical thinking. This is an enormously significant development. There is no doubt that new discoveries will deepen and strengthen this trend. We are firmly convinced that dialectical materialism is the philosophy of the future.

**Do We Need Philosophy?**

Before we start, you may be tempted to ask, "Well, what of it?" Is it really necessary for us to bother about complicated questions of science and philosophy? To such a question, two replies are possible. If what is meant is: do we need to know about such things in order to go about our daily life, then the answer is evidently no. But if we wish to gain a rational understanding of the world in which we live, and the fundamental processes at work in nature, society and our own way of thinking, then matters appear in quite a different light.

Strangely enough, everyone has a "philosophy." A philosophy is a way of looking at the world. We all believe we know how to distinguish right from wrong, good from bad. These are, however, very complicated issues which have occupied the attention of the greatest minds in history. When confronted with the terrible fact of the existence of events like the fratricidal war in the former Yugoslavia, the re-emergence of mass unemployment, the slaughter in Rwanda, many people will confess that they do not comprehend such things, and will frequently resort to vague references to "human nature." But what is this mysterious human nature which is seen as the source of all our ills and is alleged to be eternally unchangeable? This is a profoundly philosophical question, to which not many would venture a reply, unless they were of a religious cast of mind, in which case they would say that God, in His wisdom, made us like that. Why anyone should worship a Being that played such tricks on His creations is another matter.

Those who stubbornly maintain that they have no philosophy are mistaken. Nature abhors a vacuum. People who lack a coherently worked-out philosophical standpoint will inevitably reflect the ideas and prejudices of the society and the milieu in which they live. That means, in the given context, that their heads will be full of the ideas they imbibe from the newspapers, television, pulpit and schoolroom, which faithfully reflect the interests and morality of existing society.

Most people usually succeed in muddling through life, until some great upheaval compels them to re-consider the kind of ideas and values they grew up with. The crisis of society forces them to question many things they took for granted. At such times, ideas which seemed remote suddenly become strikingly relevant. Anyone who wishes to understand life, not as a meaningless series of accidents or an unthinking routine, must occupy themselves with philosophy, that is, with thought at a higher level than the immediate problems of everyday existence. Only by this means do we raise ourselves to a height where we begin to fulfil our potential as conscious human beings, willing and able to take control of our own destinies.

It is generally understood that anything worthwhile in life requires some effort. The study of philosophy, by its very nature, involves certain difficulties, because it deals with matters far removed from the world of ordinary experience. Even the terminology used presents difficulties because words are used in a way that does not necessarily correspond to the common usage. But the same is true for any specialized subject, from psychoanalysis to engineering.

The second obstacle is more serious. In the last century, when Marx and Engels first published their writings on dialectical materialism, they could assume that many of their readers had at least a working knowledge of classical philosophy, including Hegel. Nowadays it is not possible to make such an assumption. Philosophy no longer occupies the place it had before, since the role of speculation about the nature of the universe and life has long since been occupied by the sciences. The possession of powerful radio telescopes and spacecraft renders guesses about the nature and extent of our solar system unnecessary. Even the mysteries of the human soul are being gradually laid bare by the progress of neurobiology and psychology.

The situation is far less satisfactory in the realm of the social sciences, mainly because the desire for accurate knowledge often decreases to the degree that science impinges on the powerful material interests which govern the lives of people. The great advances made by Marx and Engels in the sphere of social and historical analysis and economics fall outside the scope of the present work. Suffice it to point out that, despite the sustained and frequently malicious attacks to which they were subjected from the beginning, the theories of Marxism in the social sphere have been the decisive factor in the development of modern social sciences. As for their vitality, this is testified to by the fact that the attacks not only continue, but tend to increase in intensity as time goes by.

In past ages, the development of science, which has always been closely linked to that of the productive forces, had not reached a sufficiently high level to permit men and women to understand the world in which they lived. In the absence of scientific knowledge, or the material means of obtaining it, they were compelled to rely upon the one instrument they possessed that could help them to make sense of the world, and thus gain power over it—the human mind. The struggle to understand the world was closely identified with humankind’s struggle to tear itself away from a merely animal level of existence, to gain mastery over the blind forces of nature, and to become free in the real, not legalistic, sense of the word. This struggle is a red thread running through the whole of human history.

**Role of Religion**

"Man is quite insane. He wouldn’t know how to create a maggot, and he creates Gods by the dozen." (Montaigne.)

"All mythology overcomes and dominates and shapes the force of nature in the imagination and by the imagination; it therefore vanishes with the advent of real mastery over them." (Marx)

Animals have no religion, and in the past it was said that this constituted the main difference between humans and "brutes." But that is just another way of saying that only humans possess consciousness in the full sense of the word. In recent years, there has been a reaction against the idea of Man as a special and unique Creation. This is undoubtedly correct, in the sense that humans developed from animals, and, in many important respects, remain animals. Not only do we share many of the bodily functions with other animals, but the genetic difference between humans and chimpanzees is less than two percent. That is a crushing answer to the nonsense of the Creationists.

Recent research with bonobo chimpanzees has proven beyond doubt that the primates closest to humans are capable of a level of mental activity similar in some respects to that of a human child. That is striking proof of the kinship between humans and the highest primates, but here the analogy begins to break down. Despite all the efforts of experimenters, captive bonobos have not been able to speak or fashion a stone tool remotely similar to the simplest implements created by early hominids. The two percent genetic difference between humans and chimpanzees marks the qualitative leap from the animal to the human. This was accomplished, not by a Creator, but by the development of the brain through manual labour.

The skill to make even the simplest stone tools involves a very high level of mental ability and abstract thought. The ability to select the right sort of stone and reject others; the choice of the correct angle to strike a blow, and the use of precisely the right amount of force—these are highly complicated intellectual actions. They imply a degree of planning and foresight not found in even the most advanced primates. However, the use and manufacture of stone tools was not the result of conscious planning, but was something forced upon man’s remote ancestors by necessity. It was not consciousness that created humanity, but the necessary conditions of human existence which led to an enlarged brain, speech and culture, including religion.

The need to understand the world was closely linked to the need to survive. Those early hominids who discovered the use of stone scrapers in butchering dead animals with thick hides obtained a considerable advantage over those who were denied access to this rich supply of fats and proteins. Those who perfected their stone implements and worked out where to find the best materials stood a better chance of survival than those who did not. With the development of technique came the expansion of the mind, and the need to explain the phenomena of nature which governed their lives. Over millions of years, through trial and error, our ancestors began to establish certain relations between things. They began to make abstractions, that is, to generalize from experience and practice.

For centuries, the central question of philosophy has been the relation of thinking to being. Most people live their lives quite happily without even considering this problem. They think and act, talk and work, with not the slightest difficulty. Moreover, it would not occur to them to regard as incompatible the two most basic human activities, which are in practice inseparably linked. Even the most elementary action, if we exclude simple biologically determined reactions, demands some thought. To a degree, this is true not only of humans but also of animals, such as a cat lying in wait for a mouse. In man, however, the kind of thought and planning has a qualitatively higher character than any of the mental activities of even the most advanced of the apes.

This fact is inseparably linked to the capacity for abstract thought, which enables humans to go far beyond the immediate situation given to us by our senses. We can envisage situations, not just in the past (animals also have memory, as a dog which cowers at the sight of a stick) but also the future. We can anticipate complex situations, plan and thereby determine the outcome, and to some extent determine our own destinies. Although we do not normally think about it, this represents a colossal conquest which sets humankind apart from the rest of nature. "What is distinctive of human reasoning," says Professor Gordon Childe, "is that it can go immensely farther from the actual present situation than any other animal’s reasoning ever seems to get it." (6) From this capacity springs all the manifold creations of civilization, culture, art, music, literature, science, philosophy, religion. We also take for granted that all this does not drop from the skies, but is the product of millions of years of development.

The Greek philosopher Anaxagoras (500-428 B.C.), in a brilliant deduction, said that man’s mental development depended upon the freeing of the hands. In his important article, The Part Played by Labour in the Transition from Ape to Man, Engels showed the exact way in which this transition was achieved. He proved that the upright stance, freeing of the hands for labour, the form of the hands, with the opposition of the thumb to the fingers, which allowed for clutching, were the physiological preconditions for tool making, which, in turn, was the main stimulus to the development of the brain. Speech itself, which is inseparable from thought, arose out of the demands of social production, the need to realize complicated functions by means of co-operation. These theories of Engels have been strikingly confirmed by the most recent discoveries of paleontology, which show that hominid apes appeared in Africa far earlier than previously thought, and that they had brains no bigger than those of a modern chimpanzee. That is to say, the development of the brain came after the production of tools, and as a result of it. Thus, it is not true that "In the beginning was the Word," but as the German poet Goethe proclaimed—"In the beginning was the Deed."

The ability to engage in abstract thought is inseparable from language. The celebrated prehistory Gordon Childe observes: "Reasoning, and all that we call thinking, including the chimpanzee’s, must involve mental operations with what psychologists call images. A visual image, a mental picture of, say, a banana, is always liable to be a picture of a particular banana in a particular setting. A word on the contrary is, as explained, more general and abstract, having eliminated just those accidental features that give individuality to any real banana. Mental images of words (pictures of the sound or of the muscular movements entailed in uttering it) form very convenient counters for thinking with. Thinking with their aid necessarily possesses just that quality of abstractness and generality that animal thinking seems to lack. Men can think, as well as talk, about the class of objects called ‘bananas’; the chimpanzee never gets further than ‘that banana in that tube.’ In this way the social instrument termed language has contributed to what is grandiloquently described as ‘man’s emancipation from bondage to the concrete." (7)

Early humans, after a long period of time, formed the general idea of, say, a plant or an animal. This arose out of the concrete observation of many particular plants and animals. But when we arrive at the general concept "plant," we no longer see before us this or that flower or bush, but that which is common to all of them. We grasp the essence of a plant, its innermost being. Compared with this, the peculiar features of individual plants seem secondary and unstable. What is permanent and universal is contained in the general conception. We can never actually see a plant as such, as opposed to particular flowers and bushes. It is an abstraction of the mind. Yet it is a deeper and truer expression of what is essential to the plant’s nature when stripped of all secondary features.

However, the abstractions of early humans were far from having a scientific character. They were tentative explorations, like the impressions of a child—guesses and hypotheses, sometimes incorrect, but always bold and imaginative. To our remote ancestors, the sun was a great being that sometimes warmed them, and sometimes burnt them. The earth was a sleeping giant. Fire was a fierce animal that bit them when they touched it. Early humans experienced thunder and lightning. This must have frightened them, as it still frightens animals and people today. But, unlike animals, humans looked for a general explanation of the phenomenon. Given the lack of any scientific knowledge, the explanation was invariably a supernatural one—some god, hitting an anvil with his hammer. To our eyes, such explanations seem merely amusing, like the naïve explanations of children. Nevertheless, at this period they were extremely important hypotheses—an attempt to find a rational cause for the phenomenon, in which men distinguished between the immediate experience, and saw something entirely separate from it.

The most characteristic form of early religion is animism—the notion that everything, animate or inanimate, has a spirit. We see the same kind of reaction in a child when it smacks a table against which it has banged its head. In the same way, early humans, and certain tribes today, will ask the spirit of a tree to forgive them before cutting it down. Animism belongs to a period when humankind has not yet fully separated itself from the animal world and nature in general. The closeness of humans to the world of animals is attested to by the freshness and beauty of cave-art, where horses, deer and bison are depicted with a naturalness which can no longer be captured by the modern artist. It is the childhood of the human race, which has gone beyond recall. We can only imagine the psychology of these distant ancestors of ours. But by combining the discoveries of paleontology with anthropology, it is possible to reconstruct, at least in outline, the world from which we have emerged.

In his classic anthropological study of the origins of magic and religion, Sir James Frazer writes:

"A savage hardly conceives the distinction commonly drawn by more advanced peoples between the natural and the supernatural. To him the world is to a great extent worked by supernatural agents, that is, by personal beings acting on impulses and motives like his own, liable like him to be moved by appeals to their pity, their hope, and their fears. In a world so conceived he sees no limit to this power of influencing the course of nature to his own advantage. Prayers, promises, or threats may secure him fine weather and an abundant crop from the gods; and if a god should happen, as he sometimes believes, to become incarnate in his own person, then he need appeal to no higher being; he, the savage, possesses in himself all the powers necessary to further his own well-being and that of his fellow-men." *(8)*

The notion that the soul exists separate and apart from the body comes down from the most remote period of savagery. The basis of it is quite clear. When we are asleep, the soul appears to leave the body and roam about in dreams. By extension, the similarity between death and sleep ("death’s second self," Shakespeare called it) suggested the idea that the soul could continue to exist after death. Early humans thus concluded that there is something inside them that is separate from their bodies. This is the soul, which commands the body, and can do all kinds of incredible things, even when the body is asleep. They also noticed how words of wisdom issued from the mouths of old people, and concluded that, whereas the body perishes, the soul lives on. To people used to the idea of migration, death was seen as the migration of the soul, which needed food and implements for the journey.

At first these spirits had no fixed abode. They merely wandered about, usually making trouble, which obliged the living to go to extraordinary lengths to appease them. Here we have the origin of religious ceremonies. Eventually, the idea arose that the assistance of these spirits could be enlisted by means of prayer. At this stage, religion (magic), art and science were not differentiated. Lacking the means to gain real power over their environment, early humans attempted to obtain their ends by means of magical intercourse with nature, and thus subject it to their will. The attitude of early humans to their spirit-gods and fetishes was quite practical. Prayers were intended to get results. A man would make an image with his own hands, and prostrate himself before it. But if the desired result was not forthcoming, he would curse it and beat it, in order to extract by violence what he failed to do by entreaty. In this strange world of dreams and ghosts, this world of religion, the primitive mind saw every happening as the work of unseen spirits. Every bush and stream was a living creature, friendly or hostile. Every chance event, every dream, pain or sensation, was caused by a spirit. Religious explanations filled the gap left by lack of knowledge of the laws of nature. Even death was not seen as a natural occurrence, but a result of some offence caused to the gods.

For the great majority of the existence of the human race, the minds of men and women have been full of this kind of thing. And not only in what people like to regard as primitive societies. The same kind of superstitious beliefs continue to exist in slightly different guises today. Beneath the thin veneer of civilisation lurk primitive irrational tendencies and ideas which have their roots in a remote past which has been half-forgotten, but is not yet overcome. Nor will they be finally rooted out of human consciousness until men and women establish firm control over their conditions of existence.

**Division of Labour**

Frazer points out that the division between manual and mental labour in primitive society is invariably linked to the formation of a caste of priests, shamans or magicians:

"Social progress, as we know, consists mainly in a successive differentiation of functions, or, in simpler language, a division of labour. The work which in primitive society is done by all alike and by all equally ill, or nearly so, is gradually distributed among different classes of workers and executed more and more perfectly; and so far as the products, material or immaterial, of his specialised labour are shared by all, the whole community benefits by the increasing specialisation. Now magicians or medicine-men appear to constitute the oldest artificial or professional class in the evolution of society. For sorcerers are found in every savage tribe known to us; and among the lowest savages, such as the Australian aborigines, they are the only professional class that exists." *(9)*

The dualism which separates soul from body, mind from matter, thinking from doing, received a powerful impulse from the development of the division of labour at a given stage of social evolution. The separation between mental and manual labour is a phenomenon which coincides with the division of society into classes. It marked a great advance in human development. For the first time, a minority of society was freed from the necessity to work to obtain the essentials of existence. The possession of that most precious commodity, leisure, meant that men could devote their lives to the study of the stars. As the German materialist philosopher Ludwig Feuerbach explains, real theoretical science begins with cosmology:

"The animal is sensible only of the beam which immediately affects life; while man perceives the ray, to him physically indifferent, of the remotest star. Man alone has purely intellectual, disinterested joys and passions; the eye of man alone keeps theoretic festivals. The eye which looks into the starry heavens, which gazes at that light, alike useless and harmless, having nothing in common with the earth and its necessities—this eye sees in that light its own nature, its own origin. The eye is heavenly in its nature. Hence man elevates himself above the earth only with the eye; hence theory begins with the contemplation of the heavens. The first philosophers were astronomers." *(10)*

Although at this early stage this was still mixed up with religion, and the requirements and interests of a priest caste, it also signified the birth of human civilization. This was already understood by Aristotle, who wrote:

"These theoretical arts, moreover, were evolved in places where men had plenty of free time: mathematics, for example, originated in Egypt, where a priestly caste enjoyed the necessary leisure." (11)

Knowledge is a source of power. In any society in which art, science and government is the monopoly of a few, that minority will use and abuse its power in its own interests. The annual flooding of the Nile was a matter of life and death to the people of Egypt, whose crops depended on it. The ability of the priests in Egypt to predict, on the basis of astronomical observations, when the Nile would flood its banks must have greatly increased their prestige and power over society. The art of writing, a most powerful invention, was the jealously guarded secret of the priest-caste. As Ilya Prigogine and Isabelle Stengers comment:

"Sumer discovered writing; the Sumerian priests speculated that the future might be written in some hidden way in the events taking place around us in the present. They even systematized this belief, mixing magical and rational elements." (12)

The further development of the division of labour gave rise to an unbridgeable gulf between the intellectual elite and the majority of humankind, condemned to labour with their hands. The intellectual, whether Babylonian priest or modern theoretical physicist, knows only one kind of labour, mental labour. Over the course of millennia, the superiority of the latter over "crude" manual labour becomes deeply ingrained and acquires the force of a prejudice. Language, words and thoughts become endowed with mystical powers. Culture becomes the monopoly of a privileged elite, which jealously guards its secrets, and uses and abuses its position in its own interests.

In ancient times, the intellectual aristocracy made no attempt to conceal its contempt for physical labour. The following extract from an Egyptian text known as The Satire on the Trades, written about 2000 B.C. is supposed to consist of a father’s exhortation to his son, whom he is sending to the Writing School to train as a scribe:

"I have seen how the belaboured man is belaboured—thou shouldst set thy heart in pursuit of writing. And I have observed how one may be rescued from his duties [sic!]—behold, there is nothing which surpasses writing…

"I have seen the metalworker at his work at the mouth of his furnace. His fingers were somewhat like crocodiles; he stank more than fish-roe…

"The small building contractor carries mud…He is dirtier than vines or pigs from treading under his mud. His clothes are stiff with clay…

"The arrow-maker, he is very miserable as he goes out into the desert [to get flint points]. Greater is that which he gives to his donkey than its work thereafter [is worth]…

"The laundry man launders on the [river] bank, a neighbour of the crocodile…

"Behold, there is no profession free of a boss—except for the scribe: he is the boss…

"Behold, there is no scribe who lacks food from the property of the House of the King—life, prosperity, health!…His father and his mother praise god, he being set upon the way of the living. Behold these things—I [have set them] before thee and thy children’s children." (13)

The same attitude was prevalent among the Greeks:

"What are called the mechanical arts," says Xenophon, "carry a social stigma and are rightly dishonoured in our cities, for these arts damage the bodies of those who work in them or who act as overseers, by compelling them to a sedentary life and to an indoor life, and, in some cases, to spend the whole day by the fire. This physical degeneration results also in deterioration of the soul. Furthermore, the workers at these trades simply have not got the time to perform the offices of friendship or citizenship. Consequently they are looked upon as bad friends and bad patriots, and in some cities, especially the warlike ones, it is not legal for a citizen to ply a mechanical trade." (14)

The radical divorce between mental and manual labour deepens the illusion that ideas, thoughts and words have an independent existence. This misconception lies at the heart of all religion and philosophical idealism.

It was not god who created man after his own image, but, on the contrary, men and women who created gods in their own image and likeness. Ludwig Feuerbach said that if birds had a religion, their God would have wings. "Religion is a dream, in which our own conceptions and emotions appear to us as separate existences, beings out of ourselves. The religious mind does not distinguish between subjective and objective—it has no doubts; it has the faculty, not of discerning other things than itself, but of seeing its own conceptions out of itself as distinct beings." (15) This was already understood by men like Xenophanes of Colophon (565-c.470 B.C.), who wrote "Homer and Hesiod have ascribed to the gods every deed that is shameful and dishonourable among men: stealing and adultery and deceiving each other…The Ethiopians make their gods black and snub-nosed, and the Thracians theirs grey-eyed and red-haired…If animals could paint and make things, like men, horses and oxen too would fashion the gods in their own image." (16)

The Creation myths which exist in almost all religions invariably take their images from real life, for example, the image of the potter who gives form to formless clay. In the opinion of Gordon Childe, the story of the Creation in the first book of Genesis reflects the fact that, in Mesopotamia the land was indeed separated from the waters "in the Beginning," but not by divine intervention:

"The land on which the great cities of Babylonia were to rise had literally to be created; the prehistoric forerunner of the biblical Erech was built on a sort of platform of reeds, laid criss-cross upon the alluvial mud. The Hebrew book of Genesis has familiarised us with much older traditions of the pristine condition of Sumer—a ‘chaos’ in which the boundaries between water and dry land were still fluid. An essential incident in ‘The Creation’ is the separation of these elements. Yet it was no god, but the proto-Sumerian themselves who created the land; they dug channels to water the fields and drain the marsh; they built dykes and mounded platforms to protect men and cattle from the waters and raise them above the flood; they made the first clearings in the reed brakes and explored the channels between them. The tenacity with which the memory of this struggle persisted in tradition is some measure of the exertion imposed upon the ancient Sumerians. Their reward was an assured supply of nourishing dates, a bounteous harvest from the fields they had drained, and permanent pastures for flocks and herds." *(17)*

Man’s earliest attempts to explain the world and his place in it were mixed up with mythology. The Babylonians believed that the god Marduk created Order out of Chaos, separating the land from the water, heaven from earth. The biblical Creation myth was taken from the Babylonians by the Jews, and later passed into the culture of Christianity. The true history of scientific thought commences when men and women learn to dispense with mythology, and attempt to obtain a rational understanding of nature, without the intervention of the gods. From that moment, the real struggle for the emancipation of humanity from material and spiritual bondage begins.

The advent of philosophy represents a genuine revolution in human thought. Like so much of modern civilisation, we owe it to the ancient Greeks. Although important advances were also made by the Indians and Chinese, and later the Arabs, it was the Greeks who developed philosophy and science to its highest point prior to the Renaissance. The history of Greek thought in the four hundred year period, from the middle of the 7th century B.C., constitutes one of the most imposing pages in the annals of human history.

**Materialism and Idealism**

The whole history of philosophy from the Greeks down to the present day consist of a struggle between two diametrically opposed schools of thought—materialism and idealism. Here we come across a perfect example of how the terms used in philosophy differ fundamentally from everyday language.

When we refer to someone as an "idealist" we normally have in mind a person of high ideals and spotless morality. A materialist, on the contrary, is viewed as an unprincipled so-and-so, a money-grubbing, self-centred individual with gross appetites for food and other things—in short, a thoroughly undesirable character.

This has nothing whatever to do with philosophical materialism and idealism. In a philosophical sense, idealism sets out from the view that the world is only a reflection of ideas, mind, spirit, or more correctly the Idea, which existed before the physical world. The crude material things we know through our senses are, according to this school, only imperfect copies of this perfect Idea. The most consistent proponent of this philosophy in Antiquity was Plato. However, he did not invent idealism, which existed earlier.

The Pythagoreans believed that the essence of all things was Number (a view apparently shared by some modern mathematicians). The Pythagoreans displayed a contempt towards the material world in general and the human body in particular which they saw as a prison where the soul was trapped. This is strikingly reminiscent of the outlook of mediaeval monks. Indeed, it is probable that the Church took many of its ideas from the Pythagoreans, Platonists and Neo-Platonists. This is not surprising. All religions necessarily set out from an idealist view of the world. The difference is that religion appeals to the emotions, and claims to provide a mystical, intuitive understanding of the world ("Revelation"), while most idealist philosophers try to present logical arguments for their theories.

At bottom, however, the roots of all forms of idealism are religious and mystical. The disdain for the "crude material world" and the elevation of the "Ideal" flow directly from the phenomena we have just considered in relation to religion. It is no accident that Platonist idealism developed in Athens when the system of slavery was at its height. Manual labour at that time was seen, in a very literal sense, as a mark of slavery. The only labour worthy of respect was intellectual labour. Essentially, philosophical idealism is a product of the extreme division between mental and manual labour which has existed from the dawn of written history down to the present day.

The history of Western philosophy, however, begins not with idealism but with materialism. This asserts precisely the opposite: that the material world, known to us and explored by science, is real; that the only real world is the material one; that thoughts, ideas and sensations are the product of matter organised in a certain way (a nervous system and a brain); that thought cannot derive its categories from itself, but only from the objective world which makes itself known to us through our senses.

The earliest Greek philosophers were known as "hylozoists" (from the Greek, meaning "those who believe that matter is alive"). Here we have a long line of heroes who pioneered the development of thought. The Greeks discovered that the world was round, long before Columbus. They explained that humans had evolved from fishes long before Darwin. They made extraordinary discoveries in mathematics, especially geometry, which were not greatly improved upon for one and a half millennia. They invented mechanics and even built a steam engine. What was startlingly new about this way of looking at the world was that it was not religious. In complete contrast to the Egyptians and Babylonians, from whom they had learnt a lot, the Greek thinkers did not resort to gods and goddesses to explain natural phenomena. For the first time, men and women sought to explain the workings of nature purely in terms of nature. This was one of the greatest turning-points in the entire history of human thought. True science starts here.

Aristotle, the greatest of the Ancient philosophers, can be considered a materialist, although he was not so consistent as the early hylozoists. He made a series of important scientific discoveries which laid the basis for the great achievements of the Alexandrine period of Greek science.

The Middle Ages which followed the collapse of Antiquity were a desert in which scientific thought languished for centuries. Not accidentally, this was a period dominated by the Church. Idealism was the only philosophy permitted, either as a caricature of Plato or an even worse distortion of Aristotle.

Science re-emerged triumphantly in the period of the Renaissance. It was forced to wage a fierce battle against the influence of religion (not only Catholic, but also Protestant, by the way). Many martyrs paid the price of scientific freedom with their lives. Giordano Bruno was burnt at the stake. Galileo was twice put on trial by the Inquisition, and forced to renounce his views under threat of torture.

The predominant philosophical trend of the Renaissance was materialism. In England, this took the form of empiricism, the school of thought that states that all knowledge is derived from the senses. The pioneers of this school were Francis Bacon (1561-1626), Thomas Hobbes (1588-1679) and John Locke (1632-1704). The materialist school passed from England to France where it acquired a revolutionary content. In the hands of Diderot, Rousseau, Holbach and Helvetius, philosophy became an instrument for criticising all existing society. These great thinkers prepared the way for the revolutionary overthrow of the feudal monarchy in 1789-93.

The new philosophical views stimulated the development of science, encouraging experiment and observation. The 18th century saw a great advance in science, especially mechanics. But this fact had a negative as well as a positive side. The old materialism of the 18th century was narrow and rigid, reflecting the limited development of science itself. Newton expressed the limitations of empiricism with his celebrated phrase "I make no hypotheses." This one-sided mechanical outlook ultimately proved fatal to the old materialism. Paradoxically, the great advances in philosophy after 1700 were made by idealist philosophers.

Under the impact of the French revolution, the German idealist Immanuel Kant (1724-1804) subjected all previous philosophy to a thorough criticism. Kant made important discoveries not only in philosophy and logic but in science. His nebular hypothesis of the origins of the solar system (later given a mathematical basis by Laplace) is now generally accepted as correct. In the field of philosophy, Kant’s masterpiece The Critique of Pure Reason was the first work to analyse the forms of logic which had remained virtually unchanged since they were first developed by Aristotle. Kant showed the contradictions implicit in many of the most fundamental propositions of philosophy. However, he failed to resolve these contradictions ("Antinomies"), and finally drew the conclusion that real knowledge of the world was impossible. While we can know appearances, we can never know how things are "in themselves."

This idea was not new. It is a theme which has recurred many times in philosophy, and is generally identified with what we call subjective idealism. This was put forward before Kant by the Irish bishop and philosopher George Berkeley and the last of the classical English empiricists, David Hume. The basic argument can be summed up as follows: "I interpret the world through my senses. Therefore, all that I know to exist are my sense-impressions. Can I, for example, assert that this apple exists? No. All I can say is that I see it, I feel it, I smell it, I taste it. Therefore, I cannot really say that the material world exists at all." The logic of subjective idealism is that, if I close my eyes, the world ceases to exist. Ultimately, it leads to solipsism (from the Latin "solo ipsus"—"I alone"), the idea that only I exist.

These ideas may seem nonsensical to us, but they have proved strangely persistent. In one way or another, the prejudices of subjective idealism have penetrated not only philosophy but also science for a great part of the 20th century. We shall deal more specifically with this trend later on.

The greatest breakthrough came in the first decades of the 19th century with George Wilhelm Friedrich Hegel (1770-1831). Hegel was a German idealist, a man of towering intellect, who effectively summed up in his writings the whole history of philosophy.

Hegel showed that the only way to overcome the "Antinomies" of Kant was to accept that contradictions actually existed, not only in thought, but in the real world. As an objective idealist, Hegel had no time for the subjective idealist argument that the human mind cannot know the real world. The forms of thought must reflect the objective world as closely as possible. The process of knowledge consist of penetrating ever more deeply into this reality, proceeding from the abstract to the concrete, from the known to the unknown, from the particular to the universal.

The dialectical method of thinking had played a great role in Antiquity, particularly in the naïve but brilliant aphorisms of Heraclitus (c.500 B.C.), but also in Aristotle and others. It was abandoned in the Middle Ages, when the Church turned Aristotle’s formal logic into a lifeless and rigid dogma, and did not re-appear until Kant returned it to a place of honour. However, in Kant the dialectic did not receive an adequate development. It fell to Hegel to bring the science of dialectical thinking to its highest point of development.

Hegel’s greatness is shown by the fact that he alone was prepared to challenge the dominant philosophy of mechanism. The dialectical philosophy of Hegel deals with processes, not isolated events. It deals with things in their life, not their death, in their inter-relations, not isolated, one after the other. This is a startlingly modern and scientific way of looking at the world. Indeed, in many aspects Hegel was far in advance of his time. Yet, despite its many brilliant insights, Hegel’s philosophy was ultimately unsatisfactory. Its principal defect was precisely Hegel’s idealist standpoint, which prevented him from applying the dialectical method to the real world in a consistently scientific way. Instead of the material world we have the world of the Absolute Idea, where real things, processes and people are replaced by insubstantial shadows. In the words of Frederick Engels, the Hegelian dialectic was the most colossal miscarriage in the whole history of philosophy. Correct ideas are here seen standing on their head. In order to put dialectics on a sound foundation, it was necessary to turn Hegel upside down, to transform idealist dialectics into dialectical materialism. This was the great achievement of Karl Marx and Frederick Engels. Our study begins with a brief account of the basic laws of materialist dialectics worked out by them.

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