Western, or shall I say bourgeois, views on this fundamental question of the equality or otherwise of individuals and races are neither more nor less incoherent than those of Marxism. It is a rule of good taste that, for individuals as well as for races, we ascribe success to the law of heredity and failure to the accident of environment. Those who overcome this primary inconsistency and jump one side of the fence or the other do so, as a rule, from political bias, and therefore feel obliged to claim either a scientific or a moral sanction for their views; or better still a mixture of two.

A prime example of this last group is provided by Professor Arnold Toynbee whose *Study of History* has now expanded to six volumes. Professor Toynbee's conclusions do not seem to be of great interest, but the foundations on which he rests them, in Volume One, are most instructive. In the first place he makes it clear that what he calls the race theory of the genesis of civilizations is (in his view) morally repulsive. In the second place he asserts that "the so-called racial explanation of differences in human performance and achievement is either an ineptitude or a fraud": which seems to be a slightly rhetorical way of saying that (in his view) all men are born equal. This second proposition is not, as one might suppose, simply deduced from the observation
of moral repulsiveness. Professor Toynbee calls upon an extensive arsenal of scientific information in its support. The quotation of named authority has the same importance for him as for the Russian Marxists or the medieval scholastics. One statement unsupported in this way is, however, outstanding. "It is a fact of Physiology," declares our historian, "that, in all human beings, the pigment secreted in the skin is qualitatively the same." Alas, it is true, our uniform ignorance compels us to give the same name to these pigments, not only in all races of men, but also in all the animals mentioned in the fables of Æsop. Yet what that name means we still do not know; and though the Ass may subscribe to Professor Toynbee’s doctrine of equality I fear that the Fox will retain certain mental reservations.

In 1934 our British historian introduces his study of history, with which he would, it seems, lead us towards Rome, with an account of equalitarian genetics woven out of his own imagination. And in 1947 we find the Literaturnaya Gazeta in Moscow winding up a series of articles on equalitarian genetics, woven out of a Marxist imagination, with a summary by a Russian historian whose knowledge of the subject nicely balances Professor Toynbee’s. Society, both in Russia and in the West, finds
it comfortable to subordinate the foundations of science to the opinions of historians whose conclusions are known beforehand to satisfy its established illusions, illusions which are not very different under the authority of Rome or of Moscow. In this way the conflict of science and society is resolved. At the same time, the historian is happy to play about with the exact ideas of science, knowing as little of their explosive potentialities as does the little boy playing with the mine on the seashore. Neither he nor his nursemaid knows how the thing is put together and the first thing we hear is that it goes off pop.

VII

What to do with science in our system of education presented itself to our forebears a hundred years ago as an ugly problem. We know what they did. They saw physics and chemistry as economically necessary, but the whole of science as socially and culturally repugnant. It was in much the same position as the Commonwealth Period, which some respectable schools at that time discreetly omitted from the teaching of history. Science therefore was to be presented so far as possible only to those classes of society who could be degraded no further; I mean those classes which had hitherto had no education at all.
There therefore arose a cleavage in education between two systems. One aspired to the older and richer universities and cherished what was materially least useful, and hence spiritually most edifying, in our cultural tradition. The other aspired to the technical colleges and the opportunities of industry; it devoted itself to gross material gain or scientific research. The cleavage was established between two sides, a cleavage which represented the conflict between science and a very successful and very complacent society. They did not know how useless (except for training the mind) and how traditional, and how dead, much of science was. To them it all seemed full of life and danger. The schools and universities being managed exclusively in the interests of society and tradition, every bribe was offered to divert the intelligent boy from scientific studies on to the traditional, the classical, side, the greatest bribe being, of course, admission to the older universities.

The bribe was a large one. To be sure it was possible for our two leading evolutionists, Darwin and Bateson, both of whom were privately endowed, to owe their university opportunities to the pious bequests of Henry VIII’s grandmother. But in general the dead hand of ancient endowments has tied down our universities, and through them our schools, on the sterile bed of verbal erudition. It is a bed on
which they have made themselves very comfortable. Our educational system has become devoted more and more to repeating the past and less and less to creating the future.

The effects of these processes of cleavage and diversion have been twofold. In the first place, the field of scientific discovery has been starved of much of our best abilities—at fearful cost to the nation. And in the second place, all the great offices of State have been filled by men who were deprived by their education of an understanding of the method and meaning of science. They have been filled by men who had been taught in their earliest youth to despise or ignore the forces which were actually transforming the society they were to govern.

The administrator, the editor, the judge, the bishop, the diplomat, the military commander, the governor of the school or corporation (such as the B.B.C.), the cabinet minister, the company director (even in the chemical industry), and the headmaster of the public school, came to be chosen for their high responsibilities in about ninety-nine cases out of a hundred by a process which excluded the chance of their having been given an insight into scientific discovery, an interest in its possibilities, or a respect for its use. What these excellent men do not understand they rightly fear, and
wrongly despise. They, and society as a whole, which shares their ignorance, do what they can to keep it within bounds. They are delighted to hear of the limitations of science; they are flattered to read of an astronomer who pretends to find the world as mysterious as they do; they are thrilled to hear a physicist apply the uncertainty principle to biology (which they imagine he understands) and deduce free will from it. And they will even listen to a popular philosopher week after week on the wireless for the pleasure of hearing him ridicule a science of which he is as ignorant as they are.

These symptoms themselves aggravate the disease of our society. Still more unhealthy, however, is the misappropriation of the prestige of scientific method by all kinds of interlopers, economic, emotional, or intellectual predators who impress an ignorant public by the use of the spurious external forms of science. Propagandists of all kinds, profiting from the fact that men of science are usually too busy to expose them, are quick to exploit the discovery that the jargon of science (so long as it is divorced from the ideas of science) impresses equally the intellectual and the non-intellectual world. This kind of operator exists in a hundred varieties. In Soviet Russia he is a State monopoly, elsewhere he works by private
enterprise. The United States ferments with his activities. In India more than one has had a piece of ribbon put round his neck by a respectful Governor. And one Brahminical occultist was, in a moment of defeat, admitted to the Royal Society, the same Royal Society which failed to admit H. G. Wells and J. M. Keynes.

Parenthetically, in such a world of unreality we might expect the atomic bomb to have an awakening effect. The reaction of the Press no doubt reflected public feeling in this matter. One newspaper editor was embarrassed to discover two science correspondents growing in his office where none grew before. And The Times for a moment seemed to doubt whether it had done enough to introduce its readers to scientific method. But after a couple of articles illustrating the terminology of atomic fission, the twittering of birds and the agreeable odour of archaeology returned to fill the vacant spaces in our great organ of opinion. Experience had shown that serious scientific news could not be communicated to a public which had been so well protected from the necessary education.* The cure for our troubles has to begin earlier and go deeper than a newspaper can reach.

* The football pool, however, has led to a luxuriation of combinatorial mathematics in the penny Press which would perplex and baffle the readers of weightier journals.
Newspapers are, however, valuable in explaining to the scientist the strange view that society takes of him. Using his own methods and following his own inquiries the genuine man of science is bound to reach conclusions in conflict with the dominant character of his society. He is bound to find himself in a political minority, and he may appear to be nothing less than politically eccentric. This eccentricity is necessarily and properly connected by society, and by the State, with his scientific activities. And if they are ignorant enough, and frightened enough, they will seek to destroy both him and his opinions at once. The Holy Office which condemned Galileo in 1633, the Birmingham mob which burnt down Priestley’s house in 1791, the Argentine and State Governments of the U.S.A. which from time to time dismiss scientists for holding political views of their own, the German Government which locked up such scientists, the Spanish and Portuguese Governments which still do so, and the Russian Government which secretly puts them away, are all expressing the conflict between science and society.* Men of science, it might be argued, are no more than prudent in considering what steps they should take to protect themselves from these dangers even in England.

* Which accounts for the fact that these events are rarely thought worth reporting in our newspapers.
The results of such consideration were shown by a newspaper correspondence in December 1941. The President of the Royal Society had warned scientists that they might not preserve their freedom of research (a freedom denied them elsewhere) if they were to urge scientific evidence in favour of "any special political doctrine," such a doctrine being presumably one not held by the government of the time. In other words, in England, scientific research was to be regarded as on sufferance to-day just as much as it had been in the past. Those who wished to pursue it must deny themselves the political privileges of the manual worker. *The Times* and the *Manchester Guardian* heartily applauded this view.

How far the scientist will attempt to go in expiating the crimes he confesses to having committed or contemplated against society we can now see, and also how far democratic society will condescend to accept his expiation. We can also see what much concerns us now—namely, the belief, on both sides, that scientific discoveries can lead, or ought to lead directly, to no fundamental political doctrine. On the political side this is, of course, genuine and habitual effortless ignorance. On the side of the professional scientist, on the other hand, it is an ignorance produced by centuries of effort to shelter science from the corruption of
politics. In bygone times when science was very small and politics very big, that was quite a praiseworthy effort. But to-day, when scientific thought transcends all human activity, it is an anachronism.

VIII

The crisis that is upon us, it is now fairly evident, is due to the conflict between the changes inherent in scientific discovery and the requirement of stability inherent in human society. On the one hand, the need for continued research and discovery, if we are to survive, is no longer to be doubted. On the other hand, even the most revolutionary thinker must need intellectual security and stability in the intervals between his revolutionary thoughts. Otherwise a coherent individual would be as impossible as an established society.

The crisis is equally within nations and between them. So far as it is within our own nation, it arises from our being fifty years out of date in applying science to society. So far as it is between nations, it means that we cannot afford to be fifty years out of date if we are to keep our heads above water.

How are the conflict and the crisis to be resolved? Not, I hope I have convinced you, by pretending that it does not exist. Nor by
(what is the same thing) resigning ourselves to the consolations of a religion, either an old one, or the new one which has arisen in the East. Nor, above all, by requiring our men of science to forget that their methods, their observations and their experiments have any social or political importance, and asking them to submit, like the scientists of Soviet Russia, to the authority and the judgment of the State.

The alternative to these various forms of surrender is to fight our way out of what is obviously a difficult situation. We must examine, in the way I have attempted to do, the processes of scientific discovery and their effects on our society and we must adjust and balance both these processes and this society to reduce the strain.

No adjustment is possible unless we break the hitherto unbreakable autonomous continuity of many of our social organs. In the first rank stand our universities. The sovereign department which reduces knowledge to administrative fragments must be induced to cooperate. By this means, the co-operation of science and the humanities must be promoted. The breakdown can be achieved partly by guidance from above and partly by giving a new and wider choice of subjects to the student himself. Especially in planning new universities let us avoid the example of the
old. Let us occasionally look at what has been done in those other countries which have (if we dare admit it) left us behind.

Let me give one practical example. No university should any longer give a degree to mark the completion of a training which wholly excludes either science or the humanities. Such a principle, if allowing choice to the student in his secondary study, would favour those aspects of the humanities which attracted men of science and those aspects of the sciences which attracted students of the humanities. It would entail the shedding of much that is useless, by which I mean dead, in both. The greatest benefit would come, on the side of the humanities, to the study, not of Eng. Lit., but of how to write English (and how not to write it), and, on the side of the sciences, to the study of the history and method of discovery.

There is a second development which would be favoured, and that is of the social sciences on which we ultimately depend to complete the union I envisage. Hitherto our social sciences, with their precious cargoes, have sailed by dead reckoning on seas of undefined assumptions. Those assumptions can now be defined in rigorous genetic terms: bearings can be taken and a course mapped through the rocky shoals of superstition. Hitherto the social sciences have been despised and cast adrift just as
science as a whole has been despised and cast adrift by the humanities. They have even, if we recall Wells and Keynes, been excluded from the Royal Society. If they will seize their opportunity they can now be given their proper value.

In research, as well as in education, these developments give us the chance of correcting the maladjustments of the last century and establishing a new harmony. In achieving this harmony the theory of evolution, which was the source of discord in the nineteenth century, can be the central idea. It is an idea which, at its lowest level, puts man in his place in the universe and, at a higher level, reveals to us those natural processes (including the very conflict of which I have been speaking) which will continue to control our future until we learn to do so ourselves.

From a system of education regenerated in this way secondary improvements would arise. We urgently need some method of intelligently organizing scientific discovery and its communication. It is no longer sufficient to have our systems of research controlled by authorities, some of which are indifferent to the result and some anxious to avoid any result at all. There are some who suppose that by combining the bodies governing research into one Ministry of Science we should secure
greater coherence and vitality in the administration of research. But from what I have said it will be clear that incoherence, although serious, is not the fundamental fault. That fault is constitutional opposition to research, and the consequences of research, in all the great organs of authority. They are all stuck in the mud and no one notices it. How are we to get anyone to notice it? We need a Ministry of Disturbance, a regulated source of annoyance; a destroyer of routine, an underminer of complacency, an \textit{enfant terrible}: or will nothing short of another war serve us?

In this regard, is it too much to hope that the scientific renovation, which war has thrust upon our war-making departments, will now be thrust by the perils of peace on our peace-making departments? Is our situation so easy, our food so abundant, our empire so rich, our credit so inexhaustible, that we can afford the perennial and increasing archaism of our great departments of Industry, Agriculture, and Health?

However that may be, we can now see how the impetus of discovery is continually being broken and how fundamental research is continually being degraded into routine and repetition. Knowing how universities and museums, academies and ministries, all contribute to this result, knowing how religious
systems and political institutions, bourgeois and Bolshevik alike, combine to thwart inquiry and frustrate discovery, we can safeguard ourselves against their actions. We can do so. And on whether we shall do so will depend the survival of our nation and our culture.
APPENDIX

THE CONWAY MEMORIAL LECTURESHIP

At a general meeting of the South Place Ethical Society, held on October 22, 1908, it was resolved that an effort should be made to establish a series of lectures, to be printed and widely circulated, as a permanent Memorial to Dr. Moncure Conway. The general objective in view was the furtherance of the cause of social, political, and religious freedom always closely associated with his name.

The range of the lectures (of which the thirty-ninth is published herewith) must be regulated by the financial support accorded to the scheme. It is thus most desirable that the Lecture Committee should be able to count upon such support. Those who enjoy the liberty for which Conway so nobly fought should be eager to keep his name alive as a reminder to the future of what was so hardly won. An earnest appeal is therefore made for donations and subscriptions. Contributions may be forwarded to the Hon. Treasurer.

C. J. TURNADGE, Hon. Secretary.
E. J. FAIRHALL, Hon. Treasurer, Conway Hall, Red Lion Square, W.C.1.

SOUTH PLACE ETHICAL SOCIETY,
CONWAY HALL, RED LION SQUARE, W.C.1.

Objects of the Society

"The objects of the Society are the study and dissemination of ethical principles and the cultivation of a rational religious sentiment."