I

PRELUDE

1

Whitehead

'Expression is the one fundamental sacrament. It is the outward and visible sign of an inward and spiritual grace.' A. N. Whitehead *Religion in the Making* 1926 pp. 131–32.

'If my view of the function of philosophy is correct, it is the most effective of all the intellectual pursuits. It builds cathedrals before the workmen have moved a stone, and it destroys them before the elements have worn down their arches. It is the architect of the buildings of the spirit, and it is also their solvent: and the spiritual precedes the material. Philosophy works slowly. Thoughts lie dormant for ages; and then, almost suddenly as it were, mankind finds that they have embodied themselves in institutions.' A. N. Whitehead, *Science and the Modern World* 1926 p. x.

'Shakespeare wrote his plays for English people reared in the beauty of the country, amid the pageant of life as the Middle Ages merged into the Renaissance, and with a new world across the ocean to make vivid the call of romance. Today we deal with herded town populations, reared in a scientific age. I have no doubt that unless we can meet the new age with new methods, to sustain for our populations the life of the spirit, sooner or later, amid some savage outbreak of defeated longings, the fate of Russia will be the fate of England. Historians will write as her epitaph that her fall issued from the spiritual blindness of her governing classes, from their dull materialism, and from their Pharisaic attachment to petty formulae of statesmanship.' A. N. Whitehead, *The Rhythmic Claims of Freedom and Discipline* 1922, reprinted in *The Aims of Education* 1929 p. 65.

I

When Whitehead[1] wrote an autobiographical memoir in 1936, the person he singled out for highest praise, apart from his father, was his father's friend, Archbishop Tait. Tait, as Whitehead presented him, was the successor of Lanfranc and Becket, the last in the line of English ecclesiastical statesmen who had 'acted on the policy that the church was the national organ to foster the intimate, ultimate values which enter into human life'. Tait was the last, and the whole line had failed, because the 'civilising influence of the church' had been replaced by 'secular schools, colleges and universities' and 'English ecclesiastical policy' since his death had been directed at 'organising the Anglican church as a special group within the nation'.

Whitehead did not think that the process could be reversed. 'Modern universities' covered 'all civilised lands'; the 'members of their faculties' controlled 'knowledge and its sources'. Much of his writing was designed to ensure that their 'mission of civilisation' would remain 'triumphant' throughout the world.

Whitehead's father had been an Anglican clergyman with a large rural parish in Kent. Whitehead himself had been at school at Sherborne and was an undergraduate at Trinity College, Cambridge in the 1880s, when Sidgwick's writ ran, when Pollock's *Spinoza* was being published and when Maitland was developing as history ideas which Sidgwick had expressed as philosophy.

1. Alfred North Whitehead (1861–1947). Ed. Sherborne School and Trinity College Cambridge. Fellow of Trinity College 1884–1911. Professor of Applied Mathematics Imperial College of Science 1914–24. Professor of Philosophy at Harvard 1924–37. Author of *A Treatise on Universal Algebra* 1898, (with Russell) *Principia Mathematica* 3 vols. 1910–13, *The Organisation of Thought* 1917, *An Enquiry Concerning Principles of Natural Knowledge* 1919, *The Concept of Nature* 1920, *The Principle of Relativity* 1922, *Science and the Modern World* 1926, *Religion in the Making* 1926, *Symbolism* 1928, *The Aims of Education* 1929, *The Function of Reason* 1929, *Process and Reality* 1929, *Adventures of Ideas* 1933, *Nature and Life* 1934, *Modes of Thought* 1938, *Essays in Science and Philosophy* (posthumous) 1948.

In Whitehead's academic life there were three periods – the period as a mathematical Fellow of Trinity from 1884 to 1911, the period at University College and Imperial College, London, from 1911 to 1924, and the period from his appointment to the Chair of Philosophy at Harvard in 1924 until he more or less stopped writing at the age of 77 in 1938. There were also transitions in thought, from mathematical logic in the years before *Principia Mathematica*, through criticism of the presuppositions prevalent in contemporary scientific thinking, to the assumption of a dual rôle as speculative philosopher and higher prophet whose central concern was the relationship between the secularized university, knowledge, truth, existence and the education of the world.

The high point of Whitehead's achievement in speculative philosophy was the Gifford Lectures of 1927–28, which, when published as *Process and Reality*, provided the only systematic account that he gave of the Philosophy of Organism. The Philosophy of Organism, however, was not the main – certainly it was not the most intelligible – contribution that Whitehead made to public discussion. By 1927 he had been addressing himself to problems of public policy for fifteen years.

When Whitehead began formulating a public doctrine – after *Principia Mathematica* volume I – it dealt with the place of mathematics in education, and with the methods by which a scientific education could replace the classical one that had been dominant in England since the Renaissance. Whitehead did not advocate an educational revolution; he merely observed that the twentieth-century revolution in science and technology had made it inevitable. In his Home University Library *Introduction to Mathematics* in 1911 and in the addresses he gave to mathematical teachers in the following decade, he explained what methods should be used if knowledge of mathematics was to be 'broadly spread throughout cultivated society'. He sketched the outlines of a liberal education which would not be an 'aimless accretion of special mathematical theorems' or a prelude to advanced work by professional mathematicians, but would connect 'abstract thought' with 'concrete circumstances' and lead, through particular, to general demonstrations of the fundamental relations of number, quantity and space.

At the same time that he was laying down principles for the scientific education of the 'cultured classes', Whitehead was also laying down principles for the technical education of skilled workmen. Just as schoolboys and undergraduates needed to be rescued from the routine pedantry of the text-book theorem, so the 'toiling millions' needed

to be rescued from boredom and indifference. In discussing the part to be played by mathematics and poetry in technological training, he attributed to imaginative teaching an immense range of consequences, discerning in the hands of those who conducted it the power to suffuse the weariness of work with the Benedictine ideal of 'knowledge, labour and moral energy', and anticipating in the future not only a 'large supply of skilled workmen' who would find 'joy' in what they were doing but also a dedicated body of enterprising employers who would no longer regard their businesses as 'indifferent means for acquiring other disconnected opportunities of life'. 'Alike for master and . . . men', went the conclusion, a technical or technological education, to have any chance of satisfying 'the practical needs of the nation', would have to be conducted 'in a liberal spirit', to bring practice and theory into an 'intimate union', and to provide every student with a connected conjunction of technique, science, general ideas and aesthetic appreciation.

In his wartime homilies, Whitehead argued that English teachers and educationalists were out of touch with the modern world. They had not grasped the fact that the growth of knowledge in the previous century had made possible a 'foresight' which had not existed beforehand. They had not understood that 'foresight' depended on 'special knowledge' and that this was quite different from the 'mastery of a given routine' which he identified as the characteristic of the amateur. The English had not yet decided whether to produce amateurs or experts. It was Whitehead's aim to produce experts who had the amateur's cultural breadth.

Culture was activity of thought, and the enemy of all intellectual culture was the dominance of 'inert ideas'. Inert ideas were ideas which were received without being 'utilised . . . tested or thrown into fresh combination' by the mind that received them. They were ideas which were taught as true instead of being examined and connected with the 'joy of discovery'. It was with a view to encouraging this joy that the subjects and ideas that were to be taught in an education designed for experts would be 'few and important' and designed to prove truths. It was for this reason that the most valuable intellectual development was said to be 'self-development' between the ages of sixteen and thirty.

Experts, in other words, would not be hide-bound by routine. They would have been shown how to think by thinking on a limited front.

By thinking on a limited front, they would have acquired style – that economy of expression which 'attains the end without side issues'. By thinking for themselves, they would have learnt that 'youth is the creative impulse to make something', that logic sustains it, and that the real dividing line in thought is between those who are and those who are not willing to make a mistake.

Whitehead's assumptions can be made to sound silly, as silly as Mill's. But they were consistent – a continual warning against useless learning, an affirmation of the connection between practice and theory, a proclamation of the claim that education must be designed for Life.

Whitehead was a modern thinker; he 'did not believe' that 'machinery and commerce were driving beauty out of the modern world'. He believed that 'a new beauty was being added' and that there was a duty to consider it, in its aesthetic and intellectual aspects. He was free of nostalgia, historic pathos, or any tendency to devalue the present. He rejected middle-class pessimism and anticipated for the English a brighter future than they had had in the past.

Whitehead identified obstacles to improvement – intellectual atrophy on the one hand, industrial conflict 'leading to savage upheaval' of the Bolshevik variety on the other. But he expressed a patriotic confidence. He expected the equality of England's 'democratic age' to be realized on a 'high level' rather than a low one. He hoped that scientific and technical education would turn industrial work into a 'communal' enterprise that would lock masters and men in 'sympathetic cooperation'.

From 1912 onwards, Whitehead not only contributed to intellectual activity as a mathematical logician, philosopher of science, and metaphysical cosmologist; he also reflected upon the position of intellectual activity in life. This latter concern reached its culmination in the final chapter of *Science and the Modern World – Requisites for Social Progress* – which was published in 1926, and in the first two and last sections of *Adventures of Ideas* which were published seven years later.

Adventures of Ideas was scarcely an original book. Except in discussing 'peace' (in an unusual sense), it said little that Whitehead had not said, and said more precisely, already. But its account of the social function of intellectual life, if read in conjunction with *Requisites for*

Social Progress, celebrated the qualities that he attributed to liberal civilization.

In *Requisites for Social Progress* Whitehead had made his first attempt to apply the Philosophy of Organism to 'some of the problems confronted by civilized societies'. In three particular respects, he contrasted its intuitions with the intuitions generated by the philosophies it was replacing.

In the first place, he asserted a connection between Cartesian dualism and the chaos that had followed the Industrial Revolution, imputing to Descartes' separation of mind and body two different sets of consequences in practice. On the one hand, it had led through a Protestant 'recoil' from 'aesthetic effects' to a 'limited moral outlook' which regarded aesthetic judgment as irrelevant to the development of the material environment. On the other it had led 'through private worlds of experience' to 'private worlds of morals' where 'self-respect' and pursuit of 'individual opportunities' had become the 'efficient morality' of leading industrialists. One of the more important truths that the Philosophy understood was that a factory was 'an organism exhibiting a variety of vivid values' which, if apprehended in 'completeness', would humanize the abstractions of political economy. Another was that political economy had preferred 'material things' to 'ultimate values' and, by turning competition, class conflict, international antagonism and military warfare into the 'watchwords of the nineteenth century', had made a 'gospel of hate' out of the 'struggle for existence'. A third of the Philosophy of Organism's social intuitions was that the 'philosophy of evolution', properly understood, taught that those 'organisms are successful which modify their environments so as to assist each other'.

Requisites for Social Progress directed attention to the fact that, in the modern world, 'effective knowledge' was 'professional knowledge', the result of 'specialization in particular regions of thought'. This was described as a 'celibacy of the intellect', thinking in a 'groove of abstractions' which, though necessary for progress, was inadequate for the 'comprehension of life'. It was said to be particularly dangerous 'in our democratic societies' where the 'specialised functions of the community', though performed 'better and more progressively' than in the past, were 'divorced from the concrete contemplation of the complete facts'.

Whitehead regarded the professional corporations as 'guarantors of rationality'. But he also regarded them as enemies of 'intellectual

balance'. It was to Art that he looked for ways of humanizing not only them but also the 'book learning' and 'abstract formulations' that disfigured contemporary education in general.

By Art, Whitehead meant something between the 'gross specialised values of practical men' and the 'thin specialised values of the mere scholar'. He meant 'intuition': 'immediate apprehension with the minimum of eviscerating analysis . . . appreciation of . . . individual facts in their full interplay of emergent value . . . and . . . the infinite variety of vivid values achieved by an organism in its proper environment'. He meant a 'fertilization of the soul' and a recognition that 'the life of the spirit' needs to be fed by contact with the world about it. The 'secret of art' was said to lie in its 'freedom'. 'Great Art' was said to be 'the arrangement of the environment', so as to provide 'values' for the soul. 'The soul cries aloud for release into change' went an extraordinary passage. 'It suffers the agonies of claustrophobia. The transitions of humour, wit, irreverence, play, sleep, and – above all – of art are necessary for it.'

These were truths that everybody had to understand. *Requisites for Social Progress* was designed to persuade 'the prosperous middle classes' to rise to the level of their responsibilities, to reject both the gospel of Force and the gospel of Uniformity, and to recognize in diversity and cooperation prerequisites to a 'golden age of beneficent creativeness'.

The future that was anticipated was not expected to be a stable one. The 'great ages' had been 'unstable ages'. Civilization was not to be equated with stability. The 'art' of 'free society' consisted in the maintenance of its 'symbolic code', but societies which could not combine 'reverence to their symbols' with 'freedom of revision' would either decay from atrophy or live lives 'stifled by useless shadows'. In *Requisites*, in *Symbolism*, in *Process and Reality* and in *Adventures of Ideas*, it seemed as though uncertainty and change, and adventurousness in responding to them, were necessary to all serious intellectual achievement.

Adventures of Ideas was primarily an historical work – an attempt to show how 'civilized beings arise'. It was methodologically explicit, dismissing 'pure history . . . according to the faith of the school of history prevalent in the latter part of the nineteenth century', and making it clear that the historian's descriptions of the past depended upon 'his own judgment as to what constitutes the importance of human life'.

Adventures of Ideas also arose from a desire to show how the development of civilization in the past led to an understanding of the rôle which civilization would play in the future. It saw every age of transition as a 'pattern of habitual dumb practice and emotion' being challenged by the 'senseless agencies and formulated aspirations' which between them drove men from their 'old anchorages'. The object in general was to examine the formulated aspirations involved in these transitions. In the case of the modern world, it was to 'discern the status of the impulses' by which it was being moved.

These impulses were described in terms of *general ideas* and *critical discontent* which were more fundamental than morality, truth or religion. In European thought they had been produced by the Jews and the Greeks (especially Plato), by the 'sceptical humanitarianism' of the 'Age of Reason and the Rights of Man', and by the 'fierce enthusiasm' of the early Christians, who had constructed an 'unrivalled programme for reform' which the mediaeval and Reformation churches had turned into an 'idolatrous' instrument of 'conservatism'.

Whitehead's account of European ideals centred initially on the process which had replaced slavery by the 'sociological conception of freedom'. But it was intended to apply more generally – to present the victory of the humanitarian ideal as a special example of the victory of persuasion over force that constituted human progress.

II

By the time Whitehead became a prophet in the middle 1920s, he had spent at least a decade reconstructing the view which mathematical physics took of the world with which it dealt. In *An Enquiry Concerning the Principles of Natural Knowledge*, in *The Concept of Nature* and in *The Principle of Relativity*, he had drawn out the implications of relativity and quantum mechanics for existing conceptions of time and space. This was a technical discussion, and explicitly not metaphysical. Though philosophical discussion could not be avoided, it was intended very strictly to be philosophy of science, the determination of the 'most general conceptions which apply to things observed by the senses'. It was not until *Science and the Modern World* that Whitehead undertook an argument that was explicitly metaphysical.

When he did so, he did so in two different directions. On the one hand, he claimed that mechanistic materialism needed to be directed by intuitions from religion and culture if an adequate metaphysic was

to be unfolded. On the other, he made religion and culture the object both of descriptive and of legislative philosophy. This combination of discussions, stimulated by American demand after his appointment to the Harvard Chair, made Whitehead an important figure in English thought from about the middle of the 1920s until some time in the early 1950s.

In some respects *Science and the Modern World* looked like a justification of spirituality – an alignment on the side of religion against the materialism by which it had been assaulted. It argued that religion had intuitions which were compatible with relativity and quantum mechanics, and that literature, art, religion and philosophy had a part to play not only in constructing a cosmology and metaphysics but also, through scientists' cosmological and metaphysical assumptions, in the development of science itself. Religion and culture were said to be central, and mechanistic materialism to have got into a rut in the nineteenth century because it had been unresponsive to them.

In this respect the most important chapter in *Science and the Modern World* was *The Romantic Reaction*. It was here that Whitehead made his first major cultural statement, freed himself from the philosophy of science, and moved decisively towards what he called 'concrete educated thought' – the 'concrete outlook of humanity'.

This meant in the first place 'literature'. It was through literature, and especially through 'its more concrete forms . . . poetry and drama', that the 'inmost thoughts of a generation' were said to be expressed. It was to elucidation of the inmost thoughts of the modern world that *Science and the Modern World* was dedicated.

In the early chapters 'modern' meant the historical revolution of the sixteenth century and the scientific revolution of the seventeenth, of which the historical revolution had been the progenitor. It also meant the principles that the seventeenth century had established – the 'accumulated capital of ideas' on which Europe had been living ever since. In chapter III Whitehead listed these ideas, arguing that *The Century of Genius* was not only the one century that had risen to the greatness of its occasion but also that it had established its ideas so impregnably that 'scientific realism based on mechanism' had survived Berkeley's and Hume's criticisms, and the 'unwavering belief' manifested in the individualistic enterprise of the European peoples that men were 'self-determining'. This radical inconsistency was said to have 'enfeebled thought' and to have produced 'much' that was 'half-hearted and wavering in our civilization'. It was to the eradication of