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# LITERATURE AND SCIENCE



# LITERATURE AND SCIENCE

BY

B. IFOR EVANS

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WOKING AND LONDON

## PREFATORY NOTE

Some of the matter in the following pages was used in the Giff Edmonds Memorial Lecture which I delivered before the Royal Society of Literature in 1951, and some in the Lloyd Roberts Lecture which I delivered before the Royal College of Physicians in 1953.

I used part of the argument in two lectures which I delivered in Paris at the Sorbonne, in the Faculty of Arts, in 1952, at the invitation of the Rector.

All has been re-written for this volume.

B. I. E.

November, 1953



# I

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My aim is to explore the position of the artist, and here more particularly the writer in our modern scientific society. The place and function of the writer have changed more violently than is generally realized. For economic reasons it is more difficult for the young writer to have the leisure to develop his talent, while the costs of production have severely limited the places where he may test out his compositions on the public. Further, the sovereign place of the printed word is now challenged more vigorously than at any time since the discovery of printing by new and technically agile instruments of distribution capable of addressing audiences of almost illimitable size. We have returned through radio to a new age of oral communication, and with the brilliant but dread aid of television we are about to come upon a period when radio may go to the lumber room and a new method of combined oral and visual communication will dominate the scene.

These are some of the more recent and obvious ways in which literature has recently been influenced by technology. They may be described as the *external* effects of science on literature. Their consequences have yet to be determined. The age of the printed book, which has governed literature and learning since the Renaissance may be drawing to its close. The mass audience in the technological age will look and listen, with a reception that is controlled, and may largely replace the audience of the printed word, which could exercise its own choice, and indulge in reflection, and repetition. Behind all these external changes there

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remains the fact that the writer finds the form and pressure of a scientific society crowding in on the work he would produce.

It is this historical development of the effect of science on literature that I would here examine. This dominance of science was inconceivable three centuries ago, but it has now grown to so absolute a power that all in our lives relates to it. Our religion, even among the devout, enters less into our daily lives than the results and influences of scientific investigation. Politically, science is so important that scientists, very much against their will, and to their almost complete moral embarrassment, have become the hostages of the power of the State. The world of literary imagination is now, and, if my argument carries any conviction, has been from the early eighteenth century, increasingly affected and at times even intimidated by science. The varied life of the individual experience, less orderly and less regimented than in modern society, but with that richer sensuousness which existed in earlier centuries, is no longer available to the imaginative writer.

The relationship of the artist and the scientist has not been a simple one. For, as will appear, in certain periods the writer has welcomed the new developments of science, while at others he has turned on them with a conscious though sometimes unreasoning hostility. In some instances he has extracted out of science his own fantasy and formulated his own conclusions on the meaning of existence.

If I may make a personal confession, I began these reflections, thinking more about literature than about science. I was concerned mainly with the territories which literature had lost. I have come to change my position, as I considered the question more closely, and this has not been without some embarrassment in the course of developing my argument. As I talked with those most likely to be able to

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help, I found that I had started by interpreting the scientific method on all too narrow a basis. Further, I discovered, and here I feel I may be in a position similar to that of many other literary critics, that there were whole areas of relevant literature on the history of science of which I had no knowledge. In many places I have had to rework my argument to adjust it to this new approach, and there may yet be remaining signs of inconsistency which have not been fully removed.

I have been much helped by a number of scientists and particularly by Professor H. Dingle and Professor E. N. da C. Andrade, though they are not in any way committed to my conclusions. I am also more particularly indebted to one literary historian, Professor Douglas Bush,<sup>1</sup> who made a pioneer attempt to cover much of this ground in relation to poetry. I have ventured once or twice to disagree with him but that in no way diminishes my obligations.

While revising my notions of the scientific attitude, and of the approach of scientists, I remain as confident as ever that literature has its own method and function and that this needs redefinition in our own age. It is to that re-defined contribution of literature to our civilisation that I have ventured to give the name of the new humanism.

I would therefore describe what I mean by the new humanism, and then attempt some account of the historical relationship between literature and science. At the conclusion, I would return, with the historical account as a background, to interpret the place of the new humanism in our contemporary civilisation.

<sup>1</sup> *Science and English Poetry*, by Douglas Bush (Oxford University Press, 1950).

## II

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I use the term 'humanism' in a somewhat inexact way, indeed so inexactly, that had I the philological inventiveness of Coleridge, it might have been preferable to seek currency for a new phrase. Of existing terms 'humanism' seemed to represent most closely the conclusions to which my thought was reaching.

In English the word 'humanism\*' is modern, that is, it is of the nineteenth century.<sup>1</sup> 'Humanist' on the other hand is of much older currency, and, in its origin, of a definition more precise. As early as 1605 in *The Advancement of Learning* Bacon could write of 'Antiquaries, Poets, Humanists, Statesmen, Merchants and Divines', and in this distinguished company 'humanists' were students of the classics, especially of Latin. Even at this early stage in the evolution of the term there was a distinction between the student of the divinities, and the 'humanist' who was the student of the human studies, through the classics. So Sir John Harington, writing in *The Metamorphosis of Ajax* in 15:96 commented: 'I might repute him as a good humanist, but I should ever doubt him for a good divine'. It was on the basis of this contrast that the much later word 'humanism' developed.

<sup>1</sup> My colleague, Professor R. Weiss, informs me that 'humanism' does not occur in Italian before the second half of the nineteenth century, 'umanismo' being an adaptation of the German 'Humanismus'. The first known use of it occurs in I. Del Lungo, *Prose volgari inedite di Angela Poliziano*, (Florence, 1867) p.v. For the introduction of this word into Italian cf. A. Campana, *The Origin of the Word 'Humanist'*, *Journal of the Warburg and Courtauld Institutes*, IX (1946) 71—72.

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S. T. Coleridge, to whose philological ingenuity I have already paid tribute, would seem to have been responsible for first using the term 'humanism', though with a narrower meaning than later became customary. By 'humanism' he defined the belief that Christ was only a human person. From this the word was extended to mean a system of thought dependent on human interests as distinct from theological considerations. So Mr. Gladstone in 1876: 'Comtism, or Positivism, or as it might be called Humanism/ Thus 'humanism' came to define a philosophy which, while regarding life as independent of a divine revelation, yet maintained an ethical conception of human conduct, and absorbed into itself the major affirmations of morality and of social idealism which had developed in the Liberal schools of thought. More generally, it became the literature that promoted the study of human life.

I now employ the term to suggest that the arts have their own approach towards experience, and that this approach is valuable. Further that it cannot be replaced by any other approach. I develop my argument here in relation to the art of literature, though I would submit that the question could be discussed with some modification, in relation to any of the other arts. Whitehead in his preface to *Science and the Modern World*,<sup>1</sup> wrote that the various human interests which suggest cosmologies and also are influenced by them, are science, aesthetics, ethics, religion. He suggested that during the last three centuries, the cosmology derived from science had been asserting itself at the expense of the older points of view which had their origin elsewhere.

Much of the problem lies in this sudden and dominating ascendancy of science, which came about very largely without the awareness of many scientists. It was in this same period, from the seventeenth century onwards, that

<sup>1</sup> *Science and the Modern World*, 1926.

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science itself gained a closer definition as an analytical and experimental method of examining the universe by processes that were, wherever possible, quantitative.

In its older meaning 'science' was used to define knowledge generally, the state or fact of knowing. It was in that sense that Milton used the term in describing the Tree of Knowledge:

O Sacred, Wise, and Wisdom-giving Plant,  
Mother of Science.<sup>1</sup>

In the eighteenth century science came to take on its modern meaning, though the older and more general meaning persisted, while 'philosophy' was still widely used to define 'science' as we now understand it. Sir Humphry Davy's friend Poole writes of a gentleman 'who has an extensive philosophical apparatus particularly complete in electricity and chemistry.'<sup>2</sup>

The artist, I suggest, should exert himself not to be subordinated to any of the other cosmologies, whether a political ideology, a religion, or science. He may discover a natural identity between any one of them and his art, and so he may be immersed in them. He may well be a more satisfactory artist as his knowledge of science or religion, or indeed of any other form of expression or speculation, increases. He need not be ignorant to maintain his independence. But ignorance begotten of indolence, or of the approach of the closed mind, is different from servility and subordination. The artist should not be abashed before science especially when it is proudly possessing itself of the areas once tenanted by myth, and fantasy and faith. He should reserve his own function to assert a life of the imagination.

<sup>1</sup> *Paradise Lost*, IX.

Thorpe, *Sir Humphry Davy*, 1896.

I reserve until later the definition of the life of the imagination, but I would suggest that there is a fundamental difference between the analytical method of the sciences, and that of such artists as have a prophetic or visionary power. This contrast is not as absolute as some would wish to make it, but it is there. It was stated most vehemently by Blake who regarded science as the enemy and the destroyer of the imagination. Science, for Blake, represented the analytical investigator, as indifferent as Nature herself to the life of the creative imagination, of good taste and design, of emotional pleasure and beauty. In *Lamia* Keats maintained a similar position, though expressed with less violence but with no less certainty.

The experience of the artist and its relation in his chosen medium may be biologically unimportant, and seem irrelevant in the orderly progress towards further knowledge in which science seems to be engaged. The artist, when analysed by the science of psychology, is all too often presented merely as the neurotic, and his labours only the expression of his fantasies. It is thus important that the work of the artist should be valued as a separate activity distinct from that of science or religion, an enrichment of the experience of human life that cannot be gained in any other way; important for the immediate content of existence, even if biologically useless.

The conflict which some artists have felt between their own work and what science has achieved is part of that dilemma which Whitehead associated with the dominance of the scientific attitude: 'a scientific realism based on mechanism, is conjoined with an unwavering belief in the world of men and of the higher animals as being composed of self-determining organisms. This radical inconsistency at the basis of modern thought accounts for much that is half-hearted and wavering in our civilisation. It would be going

too far to say that it distracts thought. It enfeebles it, by reason of the inconsistency lurking in the background.<sup>1</sup>

While maintaining that this fundamental contrast exists, I would emphasise that it exists between science and the arts, and not, necessarily at least, between scientists and artists. It exists with greater emphasis because science has come, so largely, to define the shape of society. On leaving these general considerations and coming to the relations of individuals one finds that, on the whole, scientists have approached the arts modestly, welcomingly, anxious for contacts, and regretful when preoccupation with their own investigations may have diminished such enjoyment of the arts as they once possessed. Some writers, particularly in the eighteenth century, have met the advancement of science with enthusiasm. Others have expressed themselves with a contempt and hostility towards both science and scientists. More frequently they have ignored the fact that they were living in a scientific age. I would, therefore, here explore some of the contacts of science and literature from the sixteenth century onwards, as a basis for the consideration of our contemporary problem.

<sup>1</sup> *Science and the Modern World*, 1926.

# III

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In England, in the sixteenth century, Francis Bacon had a mind very close to creative writers. Yet in part at least he understood that science would in the future be based on a new experimental method of investigating Nature and that through that method man would increase his power. Despite his speculations, to which Lord Macaulay with his crude, almost journalistic mind paid excessive tribute, Bacon did not appreciate much that had been achieved by the science of his own time. He neglected Galileo, and Kepler and Gilbert's work on magnetism he refused to take seriously.<sup>1</sup>

While avoiding Macaulay's excessive praise it is probably unfair to judge Bacon as severely as some modern specialists are inclined to do. After all, he was a much occupied lawyer living at the centre of a courtly world of intense and restless intrigue. The extraordinary thing is that he had any time at all for science, and whatever his inadequacies he did realise that something was happening around him, that some new method of exploring life was growing up. It can be seen that he had a prophetic vision if one examines the large picture and not the specific details. Further he exercised a prophetic quality in defining the consequences upon the life of the imagination of the new methods of science, with more understanding than any of his contemporaries. It is impossible to imagine any modern figure so immersed in the legal and political life of his time who had yet the leisure so to

<sup>1</sup> E. N. da C. Andrade, *Newton and the Science of his Age*, Proc. Roy. Soc., 6 May, 1943.

interest himself in the scientific and philosophical speculations of his age.

Bacon foresaw that from his own age in the sixteenth century the area of investigation was increasing and the area of myth, imagination and belief would decrease. He defined the change, in the very period when its effect was first becoming apparent. In one passage, at least, he wrote of Beauty in a materialistic sense, though elsewhere his mind seemed to admit other conclusions. Here, unless one is to suggest that he was ironic, he states that beauty was tangible, an ornament of existence; the glimpses and beams of diamonds that strike the eye; Indian feathers that have glorious colours, the coming into a fair garden, the coming into a fair room richly furnished; a beautiful person, and the like.' Armed with this material and possessive conception of beauty he proceeds to set poetry against reason and defines poetry as a snare, a sedative and an illusion: 'therefore it was ever thought to have some participation of divineness because it doth raise and erect the mind by submitting the shews of things to the desires of the mind; whereas reason doth buckle and bow the mind unto the nature of things.'

Bacon announced the ascendancy of the material world in the sixteenth century and few of us, even today, have yet realised all the consequences. We have not adequately confirmed to ourselves what incursions the modern, the so-called orderly world, would ultimately make upon the life of the individual, the lively and richly sensuous life of man in early times, which existed despite all the material discomforts.

The modern world led not only to the scientific attitude, but to the whole reorientation of man within the state, with all the dread consequences of a bureaucratic vocabulary,

*Natural History*, Cent. IX, 873.

a *The Advancement of Learning*, Book II.

and that regimentation which has reduced to set patterns the variety of the individual experience and dulled the higher degree of sensuous awareness in the life of men in earlier times. All this has taken place even in countries where the stifling of the individual life as a calculated principle has not been attempted. It has come as a natural consequence of new ways of thought, and of the increase of a technical world which science has brought with it as a result of the discoveries of the last three centuries.

While this great cleavage in human thought has been a continuing and increasing process from the sixteenth century its more dramatic results are only more recently apparent. They showed themselves most clearly in the nineteenth century, but then often they were welcomed as a way out to a new and idealised conception of human life. Now in the twentieth century man stands frightened, anxious, incompetent, a victim of his own one-sided and possibly self-destructive development.

## IV

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While Bacon had at least some conception of where scientific learning and investigation would lead, most of his contemporaries were either ignorant or indifferent of the new shape of things to come. Certainly the poets and other creative writers of the sixteenth century did not feel in any strong way the impact of science. Shakespeare was seemingly content with Pliny's *Natural History*, and with the medieval view of astronomy.

At times he seems, with his universal awareness, to have intuitions which lead him to be dissatisfied with these authorities. Further it could be argued that Philemon Holland's introduction to his translation of Pliny's *Natural History* had led Shakespeare to conceive of Nature as a force relentless and ultimately unmeaning, that was at variance with the conception of a Providential Deity. Pliny had, in attributing so much to Nature, seemed 'degrogat from the Almighty God'. But if some reflection of a rudimentary scepticism, arising from all this, can be found in some passages in such a play as *King Lear*, it never gains the degree of precision that merits its description as scientific. Ultimately he would agree with Holland in not wishing to publish anything 'to corrupt men's manners, and much less to prejudice Christian religion'.

Marlowe regarded the works of Aristotle as the final word on science, and this was typical of his contemporaries. Sir Philip Sidney writing with that happy early confidence of the English Renaissance, and totally untroubled by the

findings of science, could affirm the supremacy of poetry in human knowledge. So, employing 'science' in the older meaning of 'knowledge' he could write in his *Apologic for Poetnc*: 'Nowe therein of all Sciences (I speak still of humane and according to the humane conceits) is our Poet the Monarch. For he dooth not only show the way but giveth so sweete a prospect into the way as will entice any man to enter into it. Nay he dooth as if your journey should lye through a fayre Vineyard, at the first give you a cluster of grapes that, full of that taste, you may long to pass further. He beginneth not with obscure definitions which must blur the margent with interpretations, and load the memory with doubtfulness but he commeth to you with words sent in delightful proportion, either accompanied with or prepared for the will inchaunting skill of Muscike and with a tale for sooth he commeth unto you with a tale which holdeth children from play and old men from the chimney corner.'

John Donne was the first outstanding creative writer to be disturbed by the new learning in science and astronomy. The detailed assessment of Donne's scientific knowledge has been variously estimated, but in reading his work one feels as if an original and creative mind had been driven to re-assess his position. It is as if Bacon's world of knowledge had become available to a creative writer of a high and inquisitive intelligence.

The new ordering of the universe which science seemed to imply led Donne to a new kind of poetry. It was as if this awareness led him to be dissatisfied with the old and more melodious measures, and the received images. He breaks up his poetry to make possible his new introspection. Science leads him to a scepticism which was not a passive disbelief but an active faith that the soul on earth cannot possess itself of full knowledge. At first, as Donne expiessed

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it so poignantly, the new learning threw man into complete confusion:

And new Philosophy calls all in doubt  
The Element of fire is quite put out;  
The Sun is lost, and th' earth and no man's wit  
Can well direct him where to look for it.

The sceptic does not abandon the search for truth but he realises the extreme difficulty of reaching a result, at least a result on earth:

Thou shalt not peep through lattices of eyes,  
Nor hear through labyrinths of ears nor learn  
By circuit, or collections to discern,  
In heaven thou straight know'st all concerning it,  
And what concerns it not, shalt straight forget.

Thus Donne, while aware of the new learning, remained ultimately in a Christian position, in a 'creative scepticism' which later he was to share with Sir Thomas Browne.

While Donne explored the consequences of the new learning Milton seemed aware of it without accepting the conclusions. He knew the work of Copernicus and he had visited Galileo. But when he came to write on Education in his *Letter to Samuel Harthb*, he gave science a very subordinate place. His main concentration was on linguistic studies, on literature and logic and these were in turn subsidiary to morality and theology. The major purpose of all education was 'to repair the ruins of our first parents by regaining to know God aright, and out of that knowledge to love him, to imitate him, to be like him, as we may the nearest by possessing our souls of true virtue, which being united to the heavenly grace of faith, makes up the highest perfection'. The pupils are to be given arithmetic, and 'soon after the elements of geometry, even playing as the old

manner was'. They are to study agriculture and geography, and then at last comes the only direct concession to science: 'they might be then capable to read any compendious method of natural philosophy'.

In *Paradise Lost* Milton had the embarrassment of a poem which required the old system of astronomy while he himself was aware of the new. His conclusion was indecisive, but this did not seem to trouble him. He was in this one of the first of modern men, walking in two unreconciled worlds, of observed fact and of desired convictions. Adam in Book VIII asks Raphael to explain the mysteries of astronomy and the Argument of the Book sums up Milton's position: 'Adam inquires concerning celestial Motions, is doubtfully answer'd and exhorted to search rather things more worthy of knowledge/

If this was Milton's attitude it cannot be affirmed that he was typical of all that was current in his own age, or indeed in the generation before him. Though he knew Donne's poetry it would seem that it was the novelty of Donne's strange images that attracted him, not Donne's approach to the New Learning. Even Sir Thomas Browne, Richard Baxter, Jeremy Taylor and Joseph Glanvill had each in his own way an approach to science which Milton did not share. By the time he came to compose his epics and *Samson Agonistes* he was in a position of isolation and reaction, without contact or sympathy with the new scientific movements that were developing around him.

For in that later seventeenth century when he was publishing *Paradise Lost* the Royal Society was first established, and men of letters and scientists had come to be able to converse without embarrassment, and even with a measure of common understanding. The scientists had not yet attempted to reach out to that leadership which they have now gained in a dramatic, almost an absolute, form. It is

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true that the Royal Society at its dinners still encourages a more general conversation on science as distinct from the precision and detail of the learned papers produced in its proceedings. Objects of interest are still handed from one member to the other according to the old tradition. But nothing now remains of those early days when myth and magic and superstition were so closely intermingled with scientific proceedings. There were occasions when the Duke of Buckingham promised to bring into the Society a piece of a unicorn's horn, and Sir Kenelm Digby related that calcined powder of toads could be applied with several applications to the stomach of a 'pestiferate body', and when 'Sir John Finch's piece of an incombustible hat-band was produced'.

These and other early entries show that there was magic and mythology still in some of these early experiments, and there was a wide area in which a man of wit could talk with the man of science without anything that excluded him from the conversation. Samuel Pepys, for instance, was President of the Royal Society, of which his friend John Evelyn was a distinguished member. But the change was to come with dramatic suddenness.

It was Pepys, who as President gave his imprimatur on July 5-, 1686, to Newton's *Philosophiae Naturahs Principia Mathematica* which was published in the following year. Here was the great work in which the Royal Society established its true purpose, and here was the work which neither Pepys nor any of the other lay members could possibly understand. The geometrical exposition of the *Principia* made one of those separations between the men of general culture and the artist which were to increase as the range of science developed.

Apart from mathematics, however, there remained in the early days of the Royal Society a wide area of common

understanding. For many of the scientific enquiries and experiments were elementary and descriptive, even when not fanciful or absurd as in some of the examples just quoted. A number of the literary men of the time certainly found pleasure in the meetings of the Royal Society and in the company of the members. In the later seventeenth century period, Dryden, Waller, Denham and Cowley were among the men of letters most closely associated with the Society while some of the scientific members such as Robert Boyle chose a 'literary' form for their communications. Further, Boyle, like Newton, did not confine himself to science: he was engaged in writings on theological subjects and he encouraged the translation of the Scriptures.

Cowley, in many ways, was the mirror of his time. The whole concept of a house of learning, such as the Royal Society, had captured his imagination ever since he had first discovered the idea in Bacon. He was among the first nominated for the Royal Society, and remained interested in its work though he did not, actually, become a Member. Douglas Bush in *English Literature in the Earlier Seventeenth Century*, gives a vivid picture of him. 'He deserves critical respect', Bush writes, 'for he was a clever, versatile, learned, self-conscious, and serious artist, a mirror, if not a profound interpreter of the new rationalism of the English and the European mind. It is characteristic of both his nature and his position that in him the Christian humanist was not extinguished by the scientific modernist, nor metaphysical wit by neoclassical good sense.'

Writers did not, as yet, feel the scientific view of life as a burden on the imagination or any antagonism between their own purposes and those of scientists. Possibly there was no period when the influence of science entered so clearly in the practice of literature. When Bishop Sprat in his history of the Royal Society expressed a desire for an

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English language pruned and refined into 'mathematical plainness', he was obviously postulating a common refined language for the arts and the sciences. Certainly it was a period of reform and simplification of English prose, so that some seeking to define the changes too absolutely have called this the first modern period in our prose. Further, in verse, the choice of the heroic couplet as the dominant form arose from a desire for a medium that was ordered, precise, and employable in analysis and criticism. It is difficult at any later stage to discover such a parallel influence from science upon literature, affecting not only ideas but the very structure of verse.

While these happy contacts were maintained it is yet possible to discover in Sprat's comments on prose, and in those of some of the sermon-writers of the period, such as Robert South and John Tillotson, such an elevation of lucidity into its position as a major virtue, that the elaborations of imagery, and all the more emotional effects of language were discredited. It would be unwise to press this point too far, but such writers do appear as advocates of reason, of direct and intelligible communication, and as distrustful of the heights of rhetoric and the shadowy places of the imagination.

## V

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The Royal Society continued to occupy the attention of men of letters well into the eighteenth century, as is seen in the work of Pope, Swift, and Addison. That the literary style of the Transactions of the Society, at a time when they were edited by Sir Hans Sloane, came in for attack by Henry King<sup>1</sup> on the grounds of obscurity, suggests that the records of scientific discoveries were still regarded as much every educated man's business as any other writings.

It was in this early eighteenth-century period that the first major attack upon science came, with Jonathan Swift as its leader, from those whose main concern was with literature. In *The Battle of the Books*, he defended the Ancients against the Moderns, which could be interpreted as defending the traditional learning of Aristotle against the methods of modern investigation. This is an excessive simplification, for Swift's methods in this satire were complex, and the argument is concerned more with literature, and with literary scholarship, than with science. Yet, though the references were to literature, the pretensions of the man of science were never far from his mind. The major and frontal attack upon science appeared later in 'A Voyage to Laputa' in the third book of *Gulliver's Travels*.

Swift as a literary figure, a satirist and a philosophical commentator on life, has always impressed me by the strength of his intellect: I have in this context thought of him as one of the most powerful minds of the eighteenth century. Yet when one isolates this attack upon science,

i I am indebted for this reference to Miss Rosemary Syfret.

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and considers its validity, apart from any brilliance in the writing, one finds it strident, weak, often ignorant, and bounded by malice. In vain does one look for that universality of suggestion which gives strength to his satire at its best.

Swift showed no comprehension whatever for the aim and purpose of science. His attack upon Sir Isaac Newton was bred by ignorance from personal hostility based on the fact that Newton, as Master of the Mint, had reported in favour of Wood's half-pence. Much of the humour in the third book of *Gulliver*, as Professor de Morgan suggested, is trivial. He quotes as an example the description of the mathematical dinner with which the king honoured Gulliver: 'We had two courses of three dishes each. In the first course, there was a shoulder of mutton, cut into an equilateral triangle, a piece of beef into a rhomboid, and a pudding into a cycloid. The second course was two ducks, trussed up in the form of fiddles, sausages and puddings resembling flutes and haut boys, and a breast of veal in the shape of a harp. The servants cut our bread into cones, cylinders, parallelograms, and several other mathematical figures.' As satire all this seems oddly purposeless. Professor de Morgan<sup>1</sup> pursues Swift further though with a somewhat humourless precision: 'I defy', he writes, 'all your readers to produce a mathematician who would be content with mutton of two dimensions.' Swift was presumably using the terms in a popular form, but there is more strength in de Morgan's more serious observation that in satirizing mathematicians, Swift ought to have used strict terms to prevent their being able to show that he was out of his depth.

Swift, with his friends Arbuthnot and Pope, was engaged in the Scriblerus Club to exploit with a diversity of satire all vain human pretensions, in philosophy or in science. But

<sup>1</sup> *Gulliver's Travels*, Bohn Library Edition.

Swift seemed bleakly unaware of what were the aims and purposes of the science he attacked. He regarded scientific investigation as pretentious, merely a symptom of human vanity, and as such he brought all his masterly resources of venom into the attack, without making any effort to discover what it was all about.

Alone of the major intellects of his time he seemed unmoved by Newton's greatness. There is no evidence that he understood the originality of Newton's mind. Nowhere did he show any comprehension of the range of Newton's investigations. He was content to despise Newton as a Master of the Mint who had reported in favour of Wood's half-pence, and to ridicule him as a scientist.

It is not without irony that Swift, the proudest mind of his age, should attack science because of the arrogance of its practitioners. For in Newton there was a spirit of genuine humility and natural modesty to which Swift himself never attained. Further Newton was devoid of personal ambition, which so often tormented Swift, whose nature, also, craved far more than did that of Newton for recognition from his contemporaries.

It can, of course, be urged that Swift despite all his venom had a prophetic quality in his attack, and that he foresaw all the perilous places into which science was to lead man. This is to read more into his argument than the text will justify. His attack on science was only part of his attack on the vanity and pretension of mankind as a whole. Its weakness lay in his inability to discover what were the aims of the scientists whom he was attempting to dethrone.

I will come a little later to Newton's reputation among men of letters in the eighteenth century, but immediately in this context I would compare the attitude of Pope and Swift to science and to Newton. They were both viperous minds, ready to sting and to destroy, and Swift was the

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more powerful and had the more violent temperament. Yet Pope kept his head, was critical at times, but on the whole judicious, and sometimes constructive, prepared to take a much wider view than Swift's diseased venom would permit.

Pope respected Newton but was troubled by the contrast between man's increasing knowledge and his own inadequate control over himself:

Go, wondrous creature! mount where Science guides  
Go, measure earth, weigh air, and state the tides,  
Instruct the planets in what orbs to run,  
Correct old Time, and regulate the sun;  
Go teach Eternal Wisdom how to rule—  
Then drop into thyself, and be a fool.<sup>1</sup>

The more independent he was of Swift the more judicious he became. Like most of his contemporaries Pope had understood the *Opticks* more than the *Pnnapia*, though he was prepared to accept opinions of learned men on the importance of the *Prindpia*. His knowledge of both was naturally, very superficial. Yet even as early as *The Essay on Criticism* he had seized upon the possibility for his poetic imagery of Newton's prism:

False Eloquence, like the prismatic glass  
Its gaudy colours spreads on ev'ry place.  
The face of Nature we no more survey,  
All glares alike, without distinction gay.  
But true expression, like th'unchanging sun  
Clears and improves whate'er it shines upon  
It gilds all objects, but it alters none.

Pope's verse with his defined couplet, its close application to human experience, was adjusted to the growing

<sup>1</sup> Essay on Man II, 19-30.

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scientific spirit of his period. His language was one in which the intellect remained in control. The illimitable effects of Shakespeare's figurative language he regarded with distrust, and, sometimes, with disdain.

## VI

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It was around the work and personality of Newton that a number of the imaginative writers of the eighteenth and even the early nineteenth century determined their relation to science. The theme has been discussed by Marjorie Hope Nicolson in *Newton Demands the Muse*. Apart from Swift and Pope and their group, who began with a definite prejudice against science, the earliest reaction to Newton was one solely of commendation, and, as I have indicated, Pope himself, while following Swift in deriding human pretension and vanity, kept his own counsel about Newton.

The range and originality of Newton's work, even if not understood, contributed largely to this widespread reputation in literary circles and it was sustained by the modesty of his personality. When Newton died, Allan Ramsay wrote an *Ode* in his memory, inscribed to the Royal Society. It was one of many tributes:

Great Newton's dead, full ripe his fame  
Cease vulgar grief, to cloud our song:  
We thank the Author of our fame  
Who lent him to the world so long.

Among writers his reputation derived mainly from the *Opticks*, and not from the *Principia*. For the *Principle* was too difficult. The fact that it was in Latin would have disturbed literary readers less than the abstruse mathematical matters which the Latin conveyed. As Newton himself wrote at the beginning of Book III in a passage which Andrew Motte ren-

dered: 'I chose to reduce the substance of that book into the form of propositions (in the mathematical way) which should be read by those only, who had first made themselves masters of the principles established in the preceding books. Nor would I advise anyone to the previous study of every proposition of those books. For they abound with such as might cost too much time, even to readers of good mathematical learning/ All the proofs were given in form of classical geometry and one wonders what would have been the impression on Blake or Keats, who were so ready to attack Newton, if they were actually to have turned these mysterious pages of which Whewell wrote: 'as we read the *Principia* we feel as when we are in an ancient armoury where the weapons are of gigantic size; and as we look at them we marvel what manner of man he was who could use them as a weapon what we can scarcely lift as a burden.'<sup>1</sup>

Apart from the fact that the artist was likely to find the *Principia* unintelligible it was natural that his interest should be more aroused by a discourse on the theories of colour, for this touched closely on his own art. The poets who welcomed Newton and his *Opticks* found his theories of colour, as Pope had done, interesting for images and descriptions, without feeling themselves involved in any of the problems of the contrast between the methods of the sciences and the arts. The Newton enthusiasts among the poets of the eighteenth century were, it must be confessed, not poets of the first order. On the whole they belonged to that school of discursive and descriptive poetry, which, while popular at the time, now seems too easy and too pedestrian. The poets who were later to attack Newton were much better than the poets who praised him, though

<sup>1</sup> Andrade, *Newton and the Science of his Age*, Proceedings of the Royal Society, 6 May, 1943.

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it might be unwise to draw too many conclusions from this fact.

Outstanding among the admirers of Newton was James Thomson, who, in his *Ode to the Memory of Sir Isaac Newton*, wrote a direct and elaborate eulogy of Newton's theory of Light:

Even Light itself, which everything displays,  
Shone undiscovered, till his brighter mind,  
Untwisted all the shining robe of days  
And from the whitening undistinguished blaze  
Collecting every ray into his kind  
To the charmed eye educed the gorgeous train  
Of parent colours.

Admiration for Newton's personality and his outstanding mind, an attempt to popularize at least his conclusions, and to some degree a belief that his theory of light would help the poet, such were some general motives that encouraged these early eighteenth-century writers in their admiration. Miss Majjorie Hope Nicolson draws attention to the popularising motive by quoting the appearance of Richard Glover's eulogy *A Poem on Newton* in Henry Pemberton's *A View of Sir Isaac Newton's Philosophy*, 1728, and this, as Pemberton notes, was designed that, 'every gentleman who has a moderate Degree of Literature or Politeness, may by this Assistance form a comprehensive View of the stupendous Frame of Nature and the Structure of the Universe with the same Ease he now acquires a Taste of the Magnificence of a Plan of Architecture or the Elegance of a beautiful Plantation, without engaging in the minute and tedious Calculations necessary to their Production!'

As long as poets were content with these purposes of praise, adaptation and popularisation, no conflict could

<sup>1</sup> *Newton Demands the Muse*, p. 16.

arise. They had not yet seen any significance to the bold words with which Newton opened the third book of *Principia*: 'Superstat ut ex iisdem principiis doceamus constitutionem systematis mundani.' The form of the system of the world was to be mathematically defined. What would then become of myth.

Once the poet began to assert an individual view of life, an intuitive, visionary and prophetic view, then he would find himself, or would think he found himself in a conflict with the scientist. Newton, who had once been so praised, who was the demanded of the Muse, would then become the enemy of the imaginative writer.

## VII

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It was Blake who expressed this antagonism with most confidence, though it is difficult to know to what extent Blake had read Newton. In his mind, Newton was associated with Bacon and Locke. They, all three, had pursued the ways of reason, analysis and experiment, and these were contrasted with vision and imagination. The way of reason, the way of Bacon, Locke and Newton was the way of corruption and death, no less. They were materialists and opposed to the spirit.

Blake discussed his position in a number of passages in verse and prose. One has to recognise that this was no chance conclusion. However he reached it, and whatever its validity, it was fundamental in the basic principles of his own creative work. In seriousness and in satire he employed the name of Newton in his attack on materialism. Some have thought that a poet so strongly moved as Blake was by colour, could not so have attacked Newton had he not been himself affected by him in a deep way that transcended the bounds of consciousness and reasoning. It is more probable that in Blake's mind Bacon, Locke and Newton were all grouped together as representative of the scientific or analytical approach, and that Blake intended no personal element in his antagonism. Blake used Newton's name, as he did many others, almost as a symbol. So when towards the end of *Jerusalem* Error is annihilated, the truth of science and art is revealed, and Bacon, Newton and Locke become the companions in eternity of Milton,

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Shakespeare and Chaucer.<sup>1</sup> Until the Eternal Man is awakened in Spiritual Freedom, Science and Analysis and Reason, that is, Bacon, Locke, and Newton, are the enemies of vision. This view Blake expressed consistently for it is basic in his whole thought. It recurs in a passage in his *Note-Book*: 'This world of Imagination is the world of Eternity; it is the divine bosom into which we shall all go after the death of the Vegetated body. This World of Imagination is Infinite, & Eternal, whereas the world of Generation, or Vegetation, is Finite & Temporal.'

In the same *Note-Book!* he wrote in one of his versions of *The Everlasting Gospel* describing the false conceptions of Christ:

Like dr. Priestly & Bacon & Newton—  
Poor Spiritual Knowledge is not worth a button!  
For thus the Gospel Sir Isaac confutes:  
"God can only be known by his Attributes;  
' 'And as for the Indwelling of the Holy Ghost  
"Or of Christ & his Father, it's all a boast  
"And Pride & Vanity of the imagination,  
"That disdains to follow this World's Fashion."  
To teach doubt & Experiment  
Certainly was not what Christ meant.

There are some other references, some more vituperative than these. One wonders if Blake's view would have been modified if he realised that Newton devoted himself so largely to theological studies: 'There are<sup>1</sup>, Professor Andrade writes, 'over 1,300,000 words in manuscript on theology in the Portsmouth Papers.' But this would be, again, to assess the references to Blake too personally rather than to

See Mona Wilson, *The Life of William Blake*, 1948, p. 258.

<sup>1</sup> *The Note Book of William Blake*, ed. Geoffrey Keynes. Nonesuch Press, 1935, P-117-

3 Ibid' P- 141

regard Newton as the outstanding symbol in Blake's mind of the scientific attitude.

In some ways Newton invited an attack such as Blake had made. In the *Opticks*, if indeed he ever read the volume, Blake would have found the statement 'my design in this Book is not to explain the Properties of Light by Hypotheses, but to propose and prove them by Reason and Experiments'. Here were the very words that Blake thought to be the slogans of the Devil—Reason and Experiments:

Mock on, Mock on Voltaire, Rousseau:  
Mock on, Mock on: 'tis all in vain!  
You throw the sand against the wind,  
And the wind blows it back again.

And every sand becomes a Gem  
Reflected in the beams divine;  
Blown back they blind the mocking Eye,  
But still in Israel's path they shine,

The Atoms of Democritas  
And Newton's Particles of Light  
Are sands upon the Red sea shore,  
Where Israel's tents do shine so bright.

In *Europe* (1794), he showed Los, the spirit of poetry, trying to conquer Urizen or Reason, who is attempting with his intellect to usurp the area of the spirit, though the effort is not successful. He describes how 'a mighty Spirit leap'd from the land of Albion, Nam'd Newton'; this is the Spirit of Materialism. The frontispiece of *Europe* shows Urizen, in what Mona Wilson describes as one of Blake's most magnificent designs, and she adds the note that 'at the time of the Newton centenary Dr. Singer pointed out in the Nation that Blake had been the first to recognize that Newton inaugurated a new phase in the ascendancy of

science. It should be noticed', she adds, 'that in Blake's colour print, Newton, like the great figure in the frontispiece of *Europe*, holds a pair of compasses. Since it has been generally recognized that the doctrine of materialism no longer affords an adequate basis for the concepts of science, Blake's "May God us Keep From Single vision and Newton sleep" has acquired new meaning.'<sup>1</sup>

Blake of course, had fallen upon a truth, however excessively and unfairly he might express it. He was claiming for art an area of its own and a method of its own. Despite all the wildness of his language, he had arrived at the position that the mode of approach to the world that was based on analysis differed from what was revealed by the imagination and by intuition. He had stated the most fundamental division between science and the arts, though he had expressed it with an exalted and almost savage excess, and in his own baffling and personal vocabulary.

It seems both unjust and incongruous that language as violent as Blake employed should be used against Newton, even when one allows that the name is used as a symbol. For Newton's own approach, as I have already suggested, was modest. Some have doubted whether one can accept seriously Newton's comment made shortly before his death: 'I do not know what I may appear to the world; but to myself I seem to have been only like a boy, playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary while the great ocean of truth lay all undiscovered before me.'<sup>2</sup>

Why, however, should one question its sincerity, especially in a mind whose genius was so intense, if intermittent? For here is the language of a highly imaginative personality, the language of a poet. Personally, I find no difficulty in accepting the statement as a simple revelation of truth as

i *The Life of William Blake*, p. 364.

' *Andrade, Newton*, p. 18.

Newton saw it. A genius who had discovered so much was in the best position to realise how much remained to be discovered. Indeed the whole of Newton's career has many parallels with that of a creative writer, particularly that of Wordsworth who had such an admiration for him. For Wordsworth had a short period of intense creative activity on which he relied for the rest of his life, and so did Newton. Wordsworth, like Newton, occupied himself long and strenuously with labours which, compared with his great achievements, were sadly unprofitable.

All that is most original in Newton's work derives from the short period of isolated contemplation, dating from his departure from Cambridge to the little house at Woolsthorpe because of the Plague in the autumn of 1666, until his return in 1667. Newton, himself, summarising his work in that brief period, enumerated his contemplation of all the major problems on which his fame is based: 'All this', he added, 'was in the two plague years of 1665 and 1666 for in those days I was in the prime of my age for invention, and minded mathematics and philosophy more than at any time since.'

Little is known of Newton's temperament, but there is some evidence to suggest that he worked as an artist, with periods of almost uncontrollable intensity, followed by exhaustion and even despair. Professor Andrade has a revealing passage describing Newton's portrait by Kneller. He comments that it was painted about the time of the publication of the *Principia* and is particularly impressive: 'in contrast to most of the later and more formal portraits we see him in his own hair and in the casual clothing which we may suppose him to have worn when at work. The look of wild, almost hostile remoteness and of dominating and piercing intelligence seem to show that the artist has well read the features of his sitter and given us a true picture of

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the man in his hours of creative thought.<sup>1</sup> All this is confirmed by his periods of depression and sleeplessness. What ever may be the results of his scientific conclusions on men of letters, by temperament Newton was an artist.

<sup>1</sup> *Newton and the Science of his Age.*

## VIII

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Once his period of popularity with the eighteenth-century poets was over, Newton's reputation became very uncertain among writers. Blake's use of Newton's name as a symbol of all that is hostile to the vision of the artist has already been noted. He made no attempt at any reasonable assessment of Newton's achievement or his temperament. Keats, without the direct references to Newton in which Blake indulged, and though with less vehemence, maintained a consistent antagonism which he seems to have reached independently. I have been unable to discover whether Keats had any real knowledge of Newton.

It will be recalled<sup>1</sup> that Benjamin Haydon wrote in his diaries of a dinner in 1817, at which Wordsworth, Lamb, and Keats attended. Lamb, possibly a little excited, 'in a strain of humour beyond description, abused Haydon for putting Newton's head into his picture: "a fellow", said he, "who believed nothing unless it was as clear as three sides of a triangle". And then he and Keats agreed that he had destroyed all the poetry of the rainbow by reducing it to its prismatic colours. It was impossible to resist him, and we all drank "Newton's health and confusion to mathematics".' Miss Marjorie Hope Nicolson suggests that Wordsworth must have been carried away by the occasion. I will return to Wordsworth later: he must certainly have been much carried away if he accepted the toast. With Keats it was otherwise: here in jest he would be applauding

<sup>1</sup> It is indeed recalled by Marjorie Hope Nicolson, in *Newton Demands the Muse*, 1946, in an excellent passage.

what he was prepared on other occasions seriously to maintain.

It is regrettable Keats should have been infected with this antagonism to Newton, for, if he could have outgrown certain prejudices, he could have stated useful propositions on the relation of the arts and the sciences. In his more calmly reflective moments for instance, he does assert an affection for his medical books and for medical studies as part of a great unified study: 'Were T, he wrote, on May 3, 1818, 'to study physic or rather medicine again I feel it would not make the least difference in my Poetry. When the Mind is in its infancy a Bias is in reality a Bias, but when we have acquired more strength a Bias becomes no Bias. Every department of knowledge we see excellent and calculated towards a great whole. I am so convinced of this that I am glad at not having given away my medical books which I shall again look over to keep alive the little I know thitherwards . . . An extensive knowledge is needful to thinking people—it takes away the heat and fever and helps by widening speculation, to ease the Burden of the Mystery.'<sup>1</sup>

There grew, however, in Keats, and it became essential to his conception of poetry, a contrast between the analytical method of the philosopher' or scientist and the intuition of the poet. His conclusion was very similar to that of Blake though it was expressed less extravagantly and lacked the mystical background on which Blake's statements ultimately rest. But Keats' contrast of analysis and vision was not incidental in his work. It is a view to which he gave frequent expression both in the letters and the poems: 'I have never yet been able to perceive how anything can be known for truth by consequitive reasoning and yet it must be. Can it be that even the greatest Philosopher ever arrived

<sup>1</sup> Buxton Forman, Letters, p. 140.

at his goal without putting aside numerous objections?<sup>1</sup> If Keats had pursued this thought sympathetically it might have led him to a conception of the role of Imagination in Science. Instead, it hardened in his mind into the contrast of 'philosophy' or science and poetry. It was in *Lamia* that he gave the strongest expression to the contrast of the life of the imagination—the truth of beauty—to what he alleged to be the cold, dissecting and deadening methods of the scientist, and when he spoke of the scientist (or 'philosopher'), it was Newton that he had in mind:

Do not all charms fly  
At the mere touch of cold philosophy?  
There was an awful rainbow once in heaven:  
We know her woof, her texture; she is given  
In the dull catalogue of common things.  
Philosophy will clip an Angel's wings,  
Conquer all mysteries by rule and line,  
Empty the haunted air and gnomed mine—  
Unweave a rainbow.'

Ironically enough it was to Newton's prisms that Shelley went, if one can accept Miss Marjorie Hope Nicolson's conjecture, for his tribute to the dead Keats:

Life like a dome of many-coloured glass  
Stains the white radiance of Eternity  
Until Death tramples it to fragments.

<sup>1</sup> Buxton Forman, p. 168.

a lamia: II, 229-237.

## IX

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An illuminating volume which explores, as one of its themes, the relation of literature and the sciences is A. N. Whitehead's *Science and the Modern World*, to which reference has already been made. Yet this volume, so masterly in its attempt to explain simply the complex advances of modern science, is disappointing when it approaches literature. Whitehead does not seem to have examined the texts, or to have consulted those who have examined them; it is as if he did not consider the arts worthy of the methods which he applied in such a masterly way in exploring the sciences. 'In English literature', he wrote with reference to the romantics, 'the deepest thinkers of this school were Coleridge, Wordsworth and Shelley. Keats is an example of literature untouched by Science. We may neglect Coleridge's attempt at an explicit philosophical formulation. It was influential in his own generation, but in these lectures it is my object only to mention those elements of the thought of the past which stand for all time. Even with this limitation, only a selection is possible. For our purposes Coleridge is only important by his influence on Wordsworth. Thus Wordsworth and Shelley remain.

'Wordsworth was passionately absorbed in nature. It has been said of Spinoza that he was drunk with God. It is equally true that Wordsworth was drunk with nature. But he was a thoughtful, well-read man, with philosophical interests and sane even to the point of prosiness. In addition, he was a genius. He weakens his evidence by his dislike of science. We all remember his scorn of the poor man whom

he somewhat hastily accuses of peeping and botanising on his mother's grave. Passage after passage could be quoted from him, expressing this repulsion. In this respect, his characteristic thought can be summed up in his phrase 'we murder to dissect'.

In these two paragraphs, the only statement which could not be challenged is that Shelley was a thinker and interested in science. All the rest could be challenged, and, having been challenged, would be found wanting. I have already discussed Keats, and I have shown that the suggestion that he is 'untouched' by science is not supported by the evidence. The patronising reference to Coleridge is typical of the period at which Whitehead is writing, though it would not now be accepted as valid. One cannot avoid the suspicion that Whitehead was depending on the critics, and not on the text of Coleridge, for his alert mind would have seen further than this if he had examined the texts for himself. Coleridge was the friend of scientists, and knew the language of science, and more than any other creative writer of his time 'sought some reconciliation between science and literature.

There remains Wordsworth. Wordsworth is important in the whole argument. I must admit that Professor Douglas Bush, himself a distinguished historian of the romantic period, writing in his admirable *Science and English Poetry*, uses language very similar to Whitehead's. 'Wordsworth's thought or feeling', Professor Bush writes, 'is altogether non-scientific, and is not concerned with evidences of design or indeed with much except his own response to the idea of unity of Being.' For Professor Bush's work I have the profoundest respect, but here, on Wordsworth, I feel that his approach is devoid somewhat of that sense of justice which is normally such a feature of his criticism. Indeed, despite the fact that the best biography of Wordsworth was

composed by Professor Harper of Princeton, I would venture the suggestion that no American, unless he has long lived in England, can do justice to Wordsworth, for Wordsworth's thought and the experience on which that thought is based, is intensely English in its origin.

It is surprising, though, to find Professor Bush describing *A Poet's Epitaph* as an anti-intellectual and anti-scientific outburst. The whole point of the poem, as I understand it, is that the poet was interested in individuals, and in experiences, and being Wordsworth, particularly in experiences derived from nature. He was not being in any precise sense of the term anti-scientific, but he was attacking all those who regarded humanity as a collective phenomenon from whom data may be derived:

Art thou a Statist in the van  
Of public conflicts trained and bred?  
—First learn to love one living man;  
*Then* may'st thou think upon the dead.

A Lawyer art thou?—draw not nigh!  
Go, carry to some fitter place  
The keenness of the practised eye,  
The hardness of that fallow face!

Incidentally Wordsworth used the word 'Statist' in its older sense of 'politician' or one skilled in affairs of State. The only stanza which has any direct relation to science is:

Physician art thou?—one, all eyes,  
Philosopher!—*a* fingering slave,  
One that would peep and botanize  
Upon his mother's grave?

This is the very stanza to which Whitehead was referring in his extraordinary passage that Wordsworth, 'weakens his evidence by his dislike of science. We all remember his

scorn of the poor man whom he somewhat hastily accuses of peeping and botanising on his mother's grave.' But this, as I understand it, is not the meaning of the passage. Wordsworth in this and the other stanzas was asserting, as I have suggested above, that the individual life and the validity of human experience and the sentiments that arise from them are important, whatever may be the call to abstract investigation by statesman, or lawyer, or doctor. He was claiming that the poet who regards each man as a separate person has a more valuable point of view than experts who categorize humanity on one mechanical basis or another. Science as such has but little place in the argument.

Wordsworth, it is true, was conscious of experiences, derived directly from nature which seemed to him to have a mystical quality and so penetrate more deeply into the burden of the mystery of the world than was in any other way possible. In some of the early poems he spoke boldly, recklessly if you will, in support and confirmation of these experiences. But the artist will follow the single experience or intuition and see where it leads him, particularly if his creative power permits him to give it a separate existence in a poetic design. So it was in *The Tables Turned*, the poem from which Whitehead quoted the phrase 'We murder to dissect'. The mood is clear if the poem is read as a whole, along with the companion poem 'Expostulation and Reply'<sup>1</sup>.

One impulse from a vernal wood  
 May teach you more of man,  
 Of moral evil and of good,  
 Than all the sages can.

Sweet is the lore which Nature brings;  
 Our meddling intellect  
 Mis-shapes the beauteous forms of things:—  
 We murder to dissect.

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This is a mood, a poem of 'sentiment and reflection': it does not represent Wordsworth's normal, and certainly not his total attitude to learning

Whitehead speaks of 'Wordsworth's greatest poem' by far as 'the first book of *The Prelude*'. Yet it is the whole of *The Prelude* that is Wordsworth's greatest poem, and it is there, among numerous other places, that he expressed his admiration for science, and particularly for Newton. Wordsworth was an undergraduate at St. John's College, Cambridge. His bedroom window looked out on to the Chapel of Trinity. Newton's association with Trinity made a profound impression upon Wordsworth. The early version of *The Prelude* has a comment on Newton's statue in Trinity College:

And from my Bedroom, I in moonlight nights  
Could see, right opposite, a few yards off,  
The Antechapel, where the Statue stood  
Of Newton with his Prism and silent Face.

Later, on revision, Wordsworth expanded this passage until it read:

.... where the statue stood  
Of Newton with his prism and silent face,  
The marble index of a mind for ever  
Voyaging through strange seas of Thought, alone.<sup>1</sup>

In the Sixth Book of *The Prelude* Wordsworth returned to reflect upon his own studies in mathematics, which he contemplated with a proper modesty, while emphasising the possibilities of the science in its more mature forms. His mind had still Newton at the background, and that he had closely considered the passage can be seen from the

i Book III, ii. 60-63.

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degree to which he revised it. I quote its opening sections here from the final version of 1850:

Yet may we not entirely overlook  
The pleasure gathered from the rudiments  
Of geometric science. Though advanced  
In these inquiries, with regret I speak,  
No farther than the threshold, there I found  
Both elevation and composed delight:  
With Indian awe and wonder, ignorance pleased  
With its own struggles, did I meditate  
On the relation those abstractions bear  
To Nature's laws, and by what process led,  
Those immaterial agents bowed their heads  
Duly to serve the mind of earth-born man;  
From star to star, from kindred sphere to sphere,  
From system on to system without end.

More frequently from the same source I drew  
A pleasure quiet and profound, a sense  
Of permanent and universal sway,  
And paramount belief; there, recognised  
A type, for finite natures, of the one  
Supreme Existence, the surpassing life  
Which—to the boundaries of space and time,  
Of melancholy space and doleful time,  
Superior, and incapable of change,  
Nor touched by welterings of passion—is,  
And hath the name of, God. Transcendent peace  
And silence did await upon these thoughts  
That were a frequent comfort to my youth.

The whole is too long to quote. It is one of the most elaborate and closely argued passages on science in English poetry. It concludes with a tribute to the abstract symbolism of mathematics from a poet whose task led him to toil with

images derived directly from human experience, and, since they were derived from human experience, were necessarily incomplete:

Mighty is the charm  
 Of these abstractions to a mind beset  
 With images, and haunted by herself,  
 And specially delightful unto me  
 Was that clear synthesis built up aloft  
 So gracefully; even then when it appeared  
 Not more than a mere plaything, or a toy  
 To sense embodied: not the thing it is  
 In verity, an independent world,  
 Created out of pure intelligence.

The sincerity of the whole passage is unquestionable, and it is obviously the result of much personal reflection. The lucid and complete symbolism of mathematics attracted him after his own trafficking with the cloudy and imperfect symbols derived from human experience.

In the most profound episode in the whole of *The Prelude* it is to mathematics that Wordsworth returned. The moment can be found in Book X of the earlier version of *The Prelude*, where Wordsworth described how he reached a stage of moral despair from his distress at England's declaration of war on revolutionary France:

Thus I fared  
 Dragging all passions, notions, shapes of faith  
 Like culprits to the bar, suspiciously  
 Calling the mind to question in plain day  
 Her titles and her honours, now believing,  
 Now disbelieving, endlessly perplex'd  
 With impulse, motive, right and wrong, the ground  
 Of moral obligation, what the rule  
 And what the sanction, till, demanding *proof*

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And seeking it in everything, I lost  
All feeling of conviction, and, in fine,  
Sick, wearied out with contrarities,  
Yielded up moral questions in despair.

According to the earliest version of *The Prelude*, written only a few years after the experience, it was at this stage in his mental dilemma and despair that Wordsworth confessed how he turned to mathematics:

And for my future studies, as the sole  
Employment of the enquiring faculty,  
Turn'd towards mathematics, and their clear  
And solid evidence.

By 1850 this passage had been much revised and the reference to 'mathematics' had disappeared, but it is there in the version closest to the event.

Apart from these personal references to mathematics, Book V of *The Prelude* describes a dream following on Wordsworth's reading of Cervantes. Here he gave, as it were in a symbol, the place of science and of imagination, or vision perhaps it should be called, in human life. He described how, in his dream, an Arab showed him a stone and a shell: in the stone he symbolised science and in the shell, the arts, particularly the art of poetry:

the Arab told me that the stone  
(To give it in the language of the dream)  
Was 'Euclid's Elements'; and 'This', said he,  
'Is something of more worth', and at the word  
Stretched forth the shell, so beautiful in shape,  
In colour so resplendent, with command  
That I should hold it to my ear.

In this passage Wordsworth seems to suggest, as he had

' Book X, i. 889, etc.

done elsewhere, that there are separate functions for science and the arts to fulfil:

The one that held acquaintance with the stars,  
And wedded soul to soul in purest bond  
Of reason, undisturbed by space or time.

The other,

with power  
To exhilarate the spirit, and to soothe  
Through every clime, the heart of human kind.<sup>1</sup>

Thus in all that concerns science as an investigation of nature, and particularly in mathematics, Wordsworth showed much sympathy and not a little understanding.

There was another side of the problem. Wordsworth saw, with some clarity, the coming of the machine age, and his admiration of mathematics and of science as a method of investigating the mysteries of the universe made him in no way diminish his hostility to the increase of industrialisation in England, with all the social consequences that he deplored. It might almost be said that he was sympathetic to science but hostile to technology. With a little excessive simplification one might say that he was for mathematics, but against the factory and the steam-engine.

In the preface to *Lyrical Ballads*, there is a passage added to the preface of 1800 for the edition of 1802, in which Wordsworth reasserted his desire to discover means of co-operation between science and the arts. It is one of the most extensive statements of the kind written by an English poet. Unfortunately its prophecy was not fulfilled but that does not diminish Wordsworth's insight and courage in making it: 'The knowledge both of the Poet and the Man of Science is pleasure; but the knowledge of the one cleaves

<sup>1</sup> Book V, the last of the passages quoted ends at line 109.

to us as a necessary part of our existence, our natural and unalienable inheritance; the other is a personal and individual acquisition, slow to come to us, and by no habitual and direct sympathy connecting us with our fellow-beings. The Man of Science seeks truth as a remote and unknown benefactor; he cherishes and loves it in his solitude: the Poet, singing a song in which all human beings join with him, rejoices in the presence of truth as our visible friend and hourly companion. Poetry is the breath and finer spirit of all knowledge: it is the impassioned expression which is in the countenance of all Science. Emphatically may it be said of the Poet, as Shakespeare hath said of man, "that he looks before and after". He is the rock of defence for human nature; an upholder and preserver, carrying everywhere with him relationship and love. In spite of difference of soil and climate, of language and manners, of laws and customs: in spite of things silently gone out of mind, and things violently destroyed; the Poet binds together by passion and knowledge the vast empire of human society, as it is spread over the whole earth, and over all time. The objects of the Poet's thoughts are everywhere; though the eyes and senses of man are, it is true, his favourite guides, yet he will follow wheresoever he can find an atmosphere of sensation in which to move his wings. Poetry is the first and last of all knowledge—it is as immortal as the heart of man. If the labours of Men of science should ever create any material revolution, direct or indirect, in our condition, and in the impressions which we habitually receive, the Poet will sleep then no more than at present; he will be ready to follow the steps of the Man of Science, not only in those general indirect effects, but he will be at his side, carrying sensation into the midst of the objects of the science itself. The remotest discoveries of the Chemist, the Botanist, or Mineralogist, will be as proper objects of the Poet's art as any upon which

it can be employed, if the time should ever come when these things shall be familiar to us, and the relations under which they are contemplated by the followers of these respective sciences shall be manifestly and palpably material to us as enjoying and suffering beings. If the time should ever come when what is now called Science, thus familiarised to men shall be ready to put on, as it were, a form of flesh and blood, the Poet will lend his divine spirit to aid the transfiguration, and will welcome the Being thus produced, as a dear and genuine inmate of the household of man.'

In estimating the influence of science on Wordsworth, as it varies from one period to another, it may be remembered that from about 1800, and particularly in the years that immediately follow, Wordsworth was in touch with Sir Humphry Davy, then still a young man, but already a chemist of brilliant achievement.<sup>1</sup> The interest in Davy began with Coleridge but he had conveyed his enthusiasm to Wordsworth. In a letter to Davy of February 3, 1801, Coleridge had set out a proposal for starting a Chemical Laboratory with Calvert and gave his reasons why he thought Wordsworth would join in the enterprise: 'because he feels it more necessary for him to have some intellectual pursuit less closely connected with deep passion than poetry and is of course desirous, too, not to be so wholly ignorant of knowledge, so exceedingly important.' The years of his admiration for Davy may thus be regarded as the period when his esteem for science was at its highest.

While a claim can thus be made for Wordsworth's interest in science, it has to be modified by the intrusion of other ideas particularly in his later work. In those later years he became more orthodox in his approach to Christianity and this, strengthened by Coleridge's opposition to

<sup>1</sup> I am indebted to Dr. Helen Darbishire for the references that follow.

a mechanical view of the universe, led him in the sonnet series *Cave of Staffa*, 1833 to speak up for religion as opposed to science. Professor Douglas Bush quotes the references,<sup>1</sup> and notes that 'we hear of "the almighty hand" of "the sovereign Architect", and of the presumption that would assign "Mechanic laws to agency divine". In *At Sea off the Isle of Man* (1833), he feels wistful regret for the imaginative and poetical age in which nature was impelled, not "by laws inanimate", but by active and visible powers of will and passion . . . He goes on in the next sonnet to ask if we should regret that science has torn the veil from old fables, and answers that man's reason must still face mysteries which only religious faith can overleap/

It would be unjust to summarise Wordsworth's view from these later pieces and this Professor Bush readily admits. What after all are important, are not Wordsworth's views in his old age, when he was poetically weary, but his views in the period when poetically he was at the height of his creation. It was then that he placed a higher value on science than at any other period in his life. Apart from an increased acceptance of formal Christianity there hardened in him an understandable fear of technology and of the ungracious materialism of the society which the industrial revolution had produced.

Even in the days when he praised science he also insisted on the existence of intuitive experience and the mystical wisdom. Partly from his reading of Rousseau, but with confirmation from his own experience, he placed a value on feeling and on sentiment which could find no room in scientific interpretations of the universe. The ugly, urban and mechanised civilisation of the industrial age, with its emphasis on economic problems and mere commercial success, filled him with a deep fear. He seemed to see the

<sup>1</sup> *Science and English Poetry*, 1950, p. 97.

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resources of the imagination in wonder and myth being blurred out of existence in the routine drudgery of the smoky, factory towns. Further, he dreaded that nature herself would be disfigured by the penetrative activities of a technological society:

Great God! I'd rather be  
A Pagan suckled in a creed outworn;  
So might I, standing on this pleasant lea,  
Have glimpses that would make me less forlorn;  
Have sight of Proteus rising from the sea;  
Or hear Old Triton blow his wreathed horn.

Technology meant the loss of the civilisation that led to man's direct contact with nature on which so much of his conception of the civilised life was based. It meant the railroads in the Lakes and many other changes, the dangers of which he understood. At times they seemed as evil to him as did the Reform Bill itself, and from one of Mrs. Wordsworth's letters we know that he feared the Reform Bill more than a current threat of cholera in the Lakes.

Even his fear of technology and of the eruption of the harsh features of the industrial age into the scenes of nature which he loved did not blind him to the possibilities of human development that lay in scientific and technological progress. It would be asserting too much to say that this balanced view is present consistently but it is there, as for instance in the 'Steamboats, Viaducts and Railways' in *Itinerary Poems* of 1833.

Motions and Means, on land and sea at war  
With old poetic feeling, not for this,  
Shall ye, by Poets even, be judged amiss!  
Nor shall your presence, howsoe'er it mar  
The loveliness of Nature, prove a bar

<sup>1</sup> I am again indebted to Miss Helen Darbishire for this reference.

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To the Mind's gaming that prophetic sense  
Of future change, that point of vision, whence  
May be discovered what in soul ye are.  
In spite of all that beauty may disown  
In your harsh features, Nature doth embrace  
Her lawful offspring in Man's art; and Time,  
Pleased with your triumphs o'er his brother Space,  
Accepts from your bold hands the proffered crown  
Of hope, and smiles on you with cheer sublime.

Miss Darbishire tells me that there is a copy of this sonnet in Wordsworth's hand in the Library at St. John's College, Cambridge, dated November 11, 1844, in which he made a significant change in the last line. Instead of 'and smiles on you' he wrote 'and welcomes you with cheer sublime'. Wordsworth must be given credit for this, whatever he may have said elsewhere against railways.

Apart altogether from these passages on technology it is clear that in the period when Wordsworth's creative power was at its height he thought about science and its importance more possibly than any major poet of the period. If the systematic study of growth and development is a scientific interest then *The Prelude* is more perhaps than any great poem in the language a scientific poem. It marks the nearest point to which art, still legitimately employing its own methods, can approach the mental sciences. If psychology is a science, then the subtler analysis of different states of consciousness again constitutes *The Prelude* as a scientific poem. It renders additional evidence for the affirmation that it is the great modern poem in the language.

Wordsworth was, further, concerned between the difference between the modes of thought that lead to poetry and to scientific exploration. Miss Helen Darbishire calls my attention to a Fenwick note written on 'This lawn a carpet all alive' which Wordsworth composed in 1829. The note

reads: 'Some are of opinion that the habit of analysing, decomposing, and anatomising, is inevitably unfavourable to the perception of beauty. People are led into this mistake by overlooking the fact that such processes being to a certain extent within the reach of a limited intellect, we are apt to ascribe to them that insensibility of which they are in truth the effect and not the cause. Admiration and love, to which all knowledge truly vital must tend, are felt by men of real genius in proportion as their discoveries in natural Philosophy are enlarged; and the beauty in form of a plant or an animal is not made less but more apparent as a whole by more accurate insight into its constituent properties and powers. A Savant who is not also a poet in soul and a religionist in heart is a feeble and unhappy creature/

Wordsworth saw that the sciences and the arts each had their own function to fulfil. He had in his moments of keenest enlightenment a reverence for science, particularly for mathematics but also through Coleridge and Davy for chemistry. In his own work he had a profound understanding of that approach to the human mind later to be defined as psychology. Above all of his contemporaries he had responded to the problems and possibilities of science in his time.

# X

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Wordsworth was attempting, with whatever inconsistencies, to bring his poetry into union with the world of his time, with ideas and experience as he perceived them in the external world. This was an endeavour which Coleridge much admired. Aware that his own poetry in *Kubla Khan* and *The Ancient Manner* and *Christabel* did not achieve this 'high seriousness' he, ultimately, conceived an inner dissatisfaction with his own magical verse. At least this is what I understand his attitude to have been. I realise that there is a very respectable critical view that in *The Ancient Mariner* he did achieve a poem of high symbolical value. The position is argued, with discretion, by Mr. Humphry House,<sup>1</sup> and he quotes, though with only partial approval, the more extreme views of the American critic Mr. Robert Penn Warren. In his summary of Mr. Warren's conclusions he writes: 'he maintains that the poem has "two basic themes, both of them very rich and provocative". The primary theme, which is "the outcome of the fable taken at its face value as a story of crime and punishment and reconciliation", is "the theme of sacramental vision, or the theme of the 'One Life' ". The secondary theme is "concerned with the context of values in which the fable is presented" and is "the theme of the imagination". The two themes are finally fused in the poem.' I doubt if Coleridge would recognize this as in any way related to his intentions: he began the poem lightheartedly, and though it grew under

<sup>1</sup> Coleridge, 1953.

his hands it was into a thing of magic, complex in incident and emotion but uncontrolled by these solemn purposes.<sup>1</sup>

Wordsworth's poetry was the poetry Coleridge would have wished to have written. He knew the difference between 'the objective poetry of the ancients and the subjective mood of the moderns'.<sup>2</sup> He deeply admired Milton's *Paradise Lost*, for Milton seemed to him to have taken into his poem so much of the thought available at his time as was possible in a poem. As Mr. House writes, 'he thought of himself as perhaps once more achieving a seventeenth-century range and inclusiveness; and there is little doubt that, at least intermittently, he modelled himself on Milton, in ordering his reading with the deliberate intention of writing a great philosophical poem'. Coleridge defined his position in a letter to Cottle in 1796:

'The story of Milton might be told in two pages. It is this which distinguishes an epic poem from a romance in metre. Observe the march of Milton; his severe application; his laborious polish; his deep metaphysical researches; his prayer to God before he began his great work; all that could lift and swell his intellect became his daily food.

'I should not think of devoting less than twenty years to an epic poem. Ten years to collect materials and warm my mind with universal science. I would be a tolerable mathematician. I would thoroughly understand Mechanics; Hydrostatics; Optics, and Astronomy; Botany; Metallurgy; Fossilism; Chemistry; Geology; Anatomy; Medicine; then the minds of men, in all Travels, Voyages and Histories. So I would spend ten years; the next five in the composition of the poem, and the next five in the correction of it. So would I write, haply not unhearing of that divine and nightly-

<sup>1</sup> I have argued my view at some length in an article in *The Adelphi*, August, 1953.

<sup>2</sup> *Table Talk*, August 18, 1833.

whispering voice, which speaks to mighty minds, of predestined garlands, starry and unwithering.'

I can recall no occasion when an English poet has contemplated such an elaborate scientific preparation. It was too late by the beginning of the nineteenth century for this universal conception to be possible. But there is something noble in Coleridge's renaissance conception. He encouraged Wordsworth because he seemed to see Wordsworth working out in these directions. It would have been interesting to see a *Prelude* composed with Wordsworth's poetical gifts but with a mind as richly stored as was that of Coleridge.

It might, I would have thought, at least be conceded that a poet who had such a conception of poetry would not have been content with *The Ancient Manner*. It is ironical that the poetry which for a brief while he so magically conceived, so different from anything that precedes it in English verse, was not the poetry that he wished to write. It is even more ironical that the nineteenth century followed not Coleridge's firmly held conception of the epic based on universal knowledge but his remote and magical poetry. It was Coleridge, against his will as it were, who helped to give to much later verse its detachment from experience, and its reliance, sometimes an indolent reliance, on streams of images.

Apart from the achievement of his 'magical' verse, Coleridge had little to add in his more discursive poetry. It is often in a depressed and restless mood of emotional distress and failure that he here appears as in the verses he addressed to Sara Hutchinson in *Dejection* (1802):

O Lady! we receive but what we give,  
 And in our life alone does Nature live:  
 Ours is her wedding garment, ours her shroud!

And would we ought behold, of higher worth  
 Than that inanimate cold world allowed  
 To the poor loveless ever-anxious crowd,

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Ah! from the soul itself must issue forth  
A light, a glory, a fair luminous cloud  
Enveloping the Earth—  
And from the soul itself must there be sent  
A sweet and potent voice, of its own birth,  
Of all sweet sounds the life and element.

This does not get us very far. It means that it was in prose and not in verse that Coleridge's contribution to thought was to be made. As far as poetry is concerned the nineteenth century followed Coleridge, not Wordsworth. Instead of pursuing the attempt which Wordsworth made, and of which Coleridge so strongly approved, of employing poetry to function as a consolidating and conciliatory force between the imagination and science, nineteenth-century romanticism abandoned itself, sometimes recklessly and nearly always indulgently to Coleridge's dream world of *Kubla Khan*.

It is possible for the poet so to reject the external world or to become so hostile to it that he relies upon the private, irrational communications of his own unconscious mind. It was the fear of this private, arbitrary and irrational world that, in part, led to Bacon's distrust of poetry. For, as he suggested, Imagination, being not tied to the laws of matter may 'at pleasure join that which Nature hath severed, and sever that which Nature hath joined, and so make unlawful matches and divorces of things'.<sup>1</sup> Without the unconscious mind, brought into some happy relationship with consciousness, great art cannot exist, but this is different from the indulgent exploitation of the irrational upon which some modern writers depend. Thus to surrender is to deny the validity of communication based on a common and in part, at least, on an intelligible human experience.

<sup>1</sup> *The Advancement of Learning*, Book II.

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The attempt which Coleridge made in prose is of a different order. He attempted by reason and contemplation to do what he saw Wordsworth achieving imaginatively in poetry. In *Table Talk*, July 21, 1832, he described what Wordsworth was doing or might achieve; 'treat man as man—a subject of eye, ear, touch and taste, in contact with external nature, and informing the senses from the mind, and not compounding a mind out of the senses'. He wished to see a unity in human thought, and his philosophical lectures, so much misunderstood in his own day, were aimed at that end.

Coleridge had early in his Bristol days found an interest in the physical sciences through his friendship with Dr. Beddoes, and through Beddoes he came to know Humphry Davy. In 1798, Beddoes had set up in Bristol his Pneumatic Institute in which to experiment with "medicated airs" for the relief of diseases, including consumption. In October 1798, Davy, as a brilliant young chemist, who had also acquired a certain reputation as a scientist, philosopher and poet, came to act as his assistant.<sup>1</sup> Coleridge and Humphry Davy had for each other a deep and lasting affection, though typically enough, Coleridge at times combines his affection with criticism. It led Coleridge to speak with greater respect of Davy's poetry than any known example would warrant. Further, it gave Coleridge an interest not only in Davy's 'nitrous oxide' but in attempting experiments of his own in the laboratory.

There is a light-hearted picture of his affection for Davy and for chemistry in a letter which he addressed to him after a talk with Godwin; 'Godwin talks evermore of you with lively affection—"What a pity that such a man should degrade his vast Talents to Chemistry," cried he to me—

<sup>1</sup> *The Life of S. T. Coleridge, The Early Years* by Lawrence Hanson. 1938. pp. 360-361.

Why, quoth I, how, Godwin! can you talk thus of a science, of which neither you nor I understand an iota, etc., etc.; and I defended Chemistry as knowingly at least as Godwin attacked it—affirmed that it united the opposite advantages of immaterializing the mind without destroying the definiteness of the Ideas—nay even while it gave clearness to them . . . we both agreed (for G. as well as I thinks himself a Poet) that *the Poet* is the greatest possible character, etc., etc. Modest Creatures! Hurra, my dear Southey!—you (and I) and Godwin and Shakespeare, and Milton, with what an athanasiophagous grin we shall march together—*we poets*: "Down with all the lest of the World!—By the word athanasiophagous I mean devouring, Immortality by anticipation." 'Tis a sweet word!—"God Bless you, my dear Davy! Take my nonsense like a pinch of snuff—sneeze it off, it clears the head."

Coleridge thus presents one, as so often, with an ambiguous position. Through his friendship for Davy he was outstandingly the poet in sympathy with the man of science. He was responsible for encouraging Wordsworth's interest in science, for extending his attachment to mathematics and astronomy and to some understanding of chemistry. But he modified his encouragement by a distrust of a mechanical world, so that as with one hand he seems to be pressing forward he is with the other drawing back. This combines with the strange contrast to which reference has already been made, that while Wordsworth was able to put the whole of himself into his poetry, Coleridge was at his greatest as a poet in a world of fantasy.

In prose, as has already been suggested, Coleridge's aim was different. He sought for a unity in all learning, and how far he succeeded must await the studies of Dr. Kathleen

<sup>1</sup> Quoted by Lawrence Hanson, loc. cit., from *Unpublished Letters of S. T. Coleridge*, ed. E. L. Griggs, I, pp. 131-132.

Coburn, and others on the note-books, but whatever his success the direction of his studies was to be welcomed. Whitehead suggested that he aimed at 'an explicit philosophical formulation' which could not be achieved. But his mind was far too open to evidence, to every new suggestion, to find itself clamped down rigidly by any single formula. One reason why his work still remains scattered in the numerous note-books was that he realised how illimitable was his task. Yet at the very period when the arts and the sciences were about to be divided into their firmly separated and sometimes hostile specialisations he stood out in his role of the Great Reconciler.

Without a great library, without the modern apparatus of scholarship, with only his chance contacts with Beddoes and Davy, Coleridge achieved a great deal by the width of his reading and the intensity of his introspective thought. We ought now, more systematically, to develop some of the principles which Coleridge suggested. We should seek that the scientist cleanse his vocabulary of the false idols and vain encumbrances that sometimes detract from the proper pursuit of truth, and that the artist, as has already been suggested, should see that imagination exists in science and should increase his awareness of what science is attempting to achieve.

While Coleridge was never committed to the 'explicit philosophical formulation'<sup>1</sup> as Whitehead would suggest, this was in part because the quality of his mind protected him from his own intentions. Undoubtedly he did see before him the grand aim of perceiving the unity of knowledge, and thereby of discovering the ultimate unity of life. All this had the danger of imposing an absolute and arbitrary pattern upon experience. Fortunately with Coleridge the qualifications of any general formula would continuously be breaking in, and so leave the theory incomplete and the

author saved. For any complete formula about life by its very aridity and falsity somehow destroys the free and less attached approach which favours the creative artist.

For the artist the experience can be interpreted in itself or in relation to other experiences even if the ultimate ends remain undiscovered. Coleridge by the myriad varieties of his reflection was protected from going as far in this direction as Goethe, though theoretically he was in danger of developing in the same direction. As R. D. Gray writes in *Goethe, the Alchemist*: 'he needed certainty within a life-time . . . He had to come to terms with the world, even if it meant some abandonment of his integrity as a man and a scientist. He therefore marked out his ground in a broad sweep, called it the world, and held to it for the remainder of his life.' Coleridge was never to this extent committed. He was not bedazzled by any theory of the Primary Plant, or to a Colour-Theory, and he retained a strong empirical element nourished by introspection, despite his frequent yearnings for a philosophical absolutism. He, too, would dearly have enjoyed 'certainty within a life-time', but he was too large a mind and too honest to reach out towards it by any false means. He sought, ever, for some integration and the quest of the philosopher became ultimately stronger than the genius of the poet. It is only now, in the twentieth century as the material becomes available, that his stature as a thinker comes to be defined. But the stronger became within him the passion for thought, and for the 'facts of mind'<sup>1</sup> the more it clouded the landscape and befogged the country in which the poet could have wandered.

# XI

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The younger generation of romantics were less interesting in their relation to science than either Wordsworth or Coleridge. The disappointing reactions of Keats have already been considered. Byron in this matter is not a theme for discussion. There remains solely the problem of Shelley.

Shelley's relation to science is particularly puzzling. On the one hand it is claimed for him that his interest and knowledge of science were outstanding among the romantic poets. On the other hand, with his capacity for myth-making, his poetry culminating with *Prometheus Unbound* seems at first sight to be untouched by scientific conceptions. Whitehead in *Science and the Modern World*<sup>1</sup> goes as far as to say that 'had he lived a hundred years later, the twentieth century might have seen a Newton among the chemists'. This hint was eagerly seized upon by Professor Carl Grabo who in four studies<sup>2</sup> not only claimed for Shelley wide scientific reading but endeavoured to show that these studies had exercised a deep influence on even his most mature poetry. He claimed that Shelley, presumably from the resources of the Library at Field Place had read at an early age Priestley on electricity, Darwin's *Botanic Garden*, and 'Newton's *Optics*, perhaps'. Further he suggested<sup>3</sup> that 'the scientists mentioned in Shelley's letters and the scientific encyclopaedias of Nicholson and Rees, mentioned in the Notes to

<sup>1</sup> P. 104 and following.

a *A Newton Among Poets*, 1930; *The Meaning of the Witch of Atlas*, 1935; *Prometheus Unbound, an Interpretation*, 1935, and *The Magic Plant*, 1936.

3 *A Newton Among Poets*, p. 86.

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*Queen Mab*) were, of course,' on the face of it, primary sources of 'his knowledge'.

Useful though Professor Grabo's studies have been, it must be urged that he has forced his argument too far. Professor A. M. D. Hughes in *The Nascent Mind of Shelley*<sup>1</sup> has expressed a useful note of caution. 'By assuming', he writes, 'that he read through, or read extensively, the works on natural philosophy mentioned in his letters and notes, you can certainly put to his credit, by the time he was twenty-one, not much less than erudition.' As Hughes notes Grabo is claiming a knowledge by Shelley, in addition to the scientists already mentioned, of Laplace, Boyle, Cabanis, Bailly and Herschel as well as Newton. 'That', he adds, 'is rather much for a young person with other interests equally urgent unless the "reading" were sparse and slight'. Hughes suggests that, at best, Shelley was never more than an 'ardent gleaner': 'he went to Nature principally, as a poet, for her power and splendour, and, as a philosopher, to sustain his "atheism" and to explode by her testimonies what he called "the evil faith". And the "evil faith" was the Newtonian deism coupled with Christianity in its crudest acceptation.'

Whatever may have been the effect on his poetry Shelley had certainly an early enthusiasm for science, and this remained with him to the end. At the age of ten he had been sent to Sion House at Brentford, a private school where Dr. Greenlaw instructed him in the classical languages. With an enterprise unusual for those days Dr. Greenlaw employed a lecturer, Adam Walker, to instruct his young pupils in science and he came armed with his 'empyrean stove', his 'eidouranon or transparent orrery' and his solar microscope. Adam Walker also lectured at Eton and at other schools

<sup>1</sup> Published in 1947: I am indebted to him in the whole of the discussion on Shelley.

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and published an elaborate printed syllabus of his courses. They comprised 'Magnetism, Mechanics, Chemistry, "Pneumatics" or "the Principles of the Air", Fortification, Optics, the Use of the Globes, Astronomy'. As Hughes notes 'it was speculative and astonishing and Shelley was fascinated. He gazed through the microscope at mites in cheese and the wing of a fly and thrilled to the discourse on the heavens—system after system; stars "so distant that their light has not reached the Earth since creation"; 30,000 stars invisible to the naked eye; seas and hills and continents in those heavenly bodies, and "who can doubt that they are inhabited?"'

While the marvels of the stars occupied his imagination chemistry and electricity could be practised. Walker had an assistant, a technician, who sold apparatus to members of the audience. Again to quote Hughes: 'Shelley purchased some of this gear in his later years at Eton; and it is likely he did so at Brentford, and that it was in these earlier holidays at Field Place that the little ring of Sisters would wait with a wire in their hands and anxious hearts for the affrighting shock. It was certainly at this time that Shelley began with his chemical messes and mischances. He blew up the palings of the school boundary; he blew up the lid from his desk; and he poisoned Greenlaw's pigs.'

His interest in science can be seen by the numerous observations that are used in the poems, either in description or in imagery. So his lyric *The Cloud*, though expressed with a certain fantasy, is based on scientific knowledge:

I am daughter of earth and water  
    And the nursling of the sky.  
I pass through the pores of the ocean and shores.  
    I change, but I cannot die.  
For after the rain, when with never a stain,

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The pavilion of heaven is bare  
And the winds and sunbeams with their convex gleams  
Build up the blue dome of air  
I silently laugh at my own cenotaph,  
And out of the caverns of rain  
Like a child from the womb, like a ghost from the tomb  
I arise and rebuild it again.

The notes on *Queen Mob* show that astronomy had strongly affected his imagination. The immensity of the universe remained a conception behind his poetry to the end. His mind was intoxicated by the endlessness of space and by the bodies that exist in its immensity. In a note to the lines:

Whilst round the chariot's way  
Innumerable systems rolled

he wrote, with some support from Nicholson's *Encyclopaedia* 'that which appears only like a thin and silvery cloud streaking the heaven is in effect composed of innumerable clusters of suns, each shining with its own light, and illuminating numbers of planets that revolve around them. Millions and millions of suns are ranged around us, all attended by innumerable worlds yet calm, regular, and harmonious, all keeping the paths of immutable necessity'.

The major effect upon him of this astronomical knowledge was to lead to a rejection of the Christian faith. Other influences in his reading contributed to the same result, but it may be claimed that it was 'the plurality of worlds, the indefinite immensity of the universe' which he describes as a most awful subject of contemplation, that led him to feel that the whole of the Christian story was not only false in fact but was inadequate even as a symbol to represent life. 'It is impossible to believe that the spirit that pervades this infinite machine begat a son upon the body of a Jewish

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woman; or is angered at the consequences of that necessity which is a synonym of itself. All that miserable tale of the Devil, and Eve, and an Intercessor, with the childish mummeries of the God of the Jews is irreconcilable with the knowledge of the stars. The works of His fingers have borne witness against Him/

It may thus be argued that it was science that led Shelley to attempt the discovery of a new mythology in which his view of the universe could be contained. His main endeavour in poetry was to discover such a mythology. He must have realised that in *Queen Mob* and in *The Revolt of Islam* his attempt had failed. He tried again, now adapting the classical legend of Prometheus, and achieved in *Prometheus Unbound* the most complete of all his works. Yet if it was science that set him at work to create a new mythology, and gave him the background for some of the imagery, his thought became governed increasingly by a philosophy that could claim no scientific validity.

His acceptance of Godwin's theory of human perfectibility invglded him in conclusions for which there was no scientific basis. It is against the background of his early interest in science that the weakness of Shelley's attachment to Godwin becomes most apparent. Had he been able to maintain his earlier vision, when science had led him to realise a grandeur in nature he had not previously conceived, and interpreted it poetically, his achievement might have been of deep significance. If while retaining this basis he had been able to work out some new vision, which while rejecting the harsher religious dogmas of the past gave to human experience a fresh direction, he might have been that supreme poet for whom the nineteenth century waited in vain. He relied instead upon a dogma, self-selected and optimistic, which had no relationship to those early scientific studies in which he had been engaged. It is true that

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his genius as a poet has somehow transfigured Godwin's perfectibility into the myth of *Prometheus Unbound* and as some critics have suggested there are scattered throughout this great work incidental scientific references. All this, however, is very different from any fundamental use of science in poetry as seemed once possible with Shelley in his early years.

## XII

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In the middle and late nineteenth century the relationship between the artist and the scientist turned mainly upon two problems. First, there was a continuance of the fear expressed by some of the romantic poets that science would encourage the mechanistic view of the universe. This was combined with an increasing antagonism to technology and to the industrial society on which it was based. Ultimately this led to the aestheticism of 'art for art's sake', so openly dominant at the close of the century, and powerful, even now, in the middle of the twentieth century in a number of disguises. Unfortunately the happy personal associations which had existed between some of the older romantic poets and scientists broke down completely and as these disappeared the reverence for the vast, new knowledge that seemed to be becoming available was also lost. Scientific writings were no longer a part of every educated man's business as they had been in the early days of the Royal Society, though valiant attempts were made to retain the old tradition. When the Royal Institution was founded in 1799 and had its charter when the nineteenth century was only thirteen days old, it still attempted to maintain that the findings of science were within the range of the intelligent layman, and its intermittent tribute to the arts has continued to the present day. But whatever attempts might be made they could not disguise the reality that science was becoming increasingly a study for highly trained specialists, who could find no language of communication with society at large.

While this continuing, and developing antagonism remained on the technological side there developed in the mid-nineteenth century a new and powerful influence from biology. It appeared as a formidable challenge that man himself was biologically only a part of the system of creation and that his special place in nature on which his religion, his ethics and much in the creative arts had depended was a mere illusion. This conclusion was defined by Tennyson as early as 1850 in *In Memoriam*, a poem of great and vivid strength, which in retrospect appears as one of the central poems of the century. Tennyson was writing before the appearance of Darwin's *Origin of Species* of 185-9, and his knowledge of evolutionary theory was ever most perfunctory. He had read and been moved by popular works such as Chambers's *Vestiges of Creation*, but however slight the sources of his knowledge, he was profoundly affected by the apparent depreciation of the position of humanity in creation as a whole which the evolutionary doctrines indicated.

Much of his poetry rested in the romantic tradition remote from all these considerations. He accepted Coleridge's conception of the magical in poetry, or relied on a leisurely medievalism. In the *Idylls*, for instance, he indulged in a high perfection of verbal felicity but with a detachment from the major problems which affected the destiny of humanity, or the immediate problems that affected his own century. As I have written elsewhere his knights in moving up and down the country seemed singularly skilful in avoiding the industrial towns.

In *In Memoriam*, however, he confessed, like some self-torturing mystic, the loneliness, the isolation and the despair which the new scientific view of the world had imposed upon him:

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I falter where I firmly trod,  
And falling with my weight of cares  
Upon the great world's altar-stairs  
That slope thro' darkness up to God,

I stretch lame hands of faith, and grope,  
And gather dust and chaff, and call  
To what I feel is Lord of all,  
And faintly trust the larger hope.

'So careful of the type?' but no.  
From scarp'd cliff and quarried stone  
She cries, 'A thousand types are gone:  
I care for nothing, all shall go.

'Thou makest thine appeal to me:  
I bring to life, I bring to death:  
The spirit does but mean the breath:  
I know no more.' And he, shall he,

Man, her last work, who seem'd so fair,  
Such splendid purpose in his eyes,  
Who roll'd the psalm to wintry skies,  
Who built him fanes of fruitless prayer,

Who trusted God was love indeed  
And love Creation's final law—  
Tho' Nature, red in tooth and claw  
With ravine, shriek'd against his creed—

Who loved, who suffer'd countless ills,  
Who battled for the True, the Just,  
Be blown about the desert dust,  
Or seaPd within the iron hills?

*In Memoriam* does not rise to the greatness in poetry of Dante but it has a similarity of intention and design, and

among the poems of its own century it has greatness. Tennyson achieved more fully than any other poet in the nineteenth century the imaginative definition of the hopes and the fears of men faced with a new and disturbing conception of life. How deep were man's fears at that period is shown by a letter written in 1859 by Adam Sedgwick to Charles Darwin, protesting that Darwin had tried to break the link of the material, the moral and the religious: 'Were it possible (which, thank God, it is not) to break it, humanity in my mind would suffer a damage that might brutalize it, and sink the human race into a lower grade of degradation than any into which it has fallen since its written records tell us of its history.' Tennyson shared these fears in the earlier movements of his poem and confessed that man may be merely a biological experiment and a biological experiment that may have gone wrong. It is true that Tennyson having stated this bleak prospect with great imaginative precision concluded with a firm and optimistic restatement of his Christian faith. The conclusion diminishes the originality of the moving central sections of the poem where the other possibilities of human destiny are described. The expression of doubt is worked out in highly imaginative language, while the Christian affirmation is loudly rhetorical. One may cherish the Christian conclusion, but artistically it is less powerful than the definition of the possibly tragic fate of humanity. Similarly one finds in T. S. Eliot's poetry a far more powerful expression of the degeneration of civilisation, than of his later Christian convictions.

From this sense of fear and depression in relationship to biological science the imaginative artist has never fully recovered and it is part of Tennyson's greatness that he defined the relationship more fully than any other modern poet in England. The difficulty and the strength of his achievement can be seen more clearly when it is realised

that Browning contrived to live over the same period without having been affected by the problem.

The spiritual distress caused by the possibilities opened out by biological science is present in a number of nineteenth-century poems, even if their text does not refer directly to science. So in Matthew Arnold's moving poem *Dover Beach*:

The Sea of Faith  
Was once, too, at the full, and round earth's shore  
Lay like the folds of a bright girdle furl'd.  
But now I only hear  
Its melancholy, long, withdrawing roar,  
Retreating, to the breath  
Of the night-wind, down the vast edges drear  
And naked shingles of the world.

The major movement in nineteenth-century poetry attempts through romanticism and reaction to reject science altogether. That is the road which Morris, Rossetti and Swinburne followed and how far they have moved in that tradition can be seen by a comparison of the interests of the young Shelley and of the young Swinburne. The poetry that they composed is, at its best, of great interest but it has this weakness, that the theory on which it is based tends to protect the poet from all the main issues of his time.

The major result in the nineteenth century has been this wide separation between the scientist and the man of letters. The whole technological revolution in the nineteenth century and its consequent effects upon society, placed the artist frequently in a position of isolation in which he felt alienated from the society in which he lived. This was the position of the pre-Raphaelites and is represented by Rossetti in the medieval themes of both his paintings and his poetry. It occurs with almost a plaintive note in *The Burden of*

*Nineveh*, where after seeing 'a winged beast from Nineveh' being hoisted into the British Museum he laments the ugliness of the society in which he lives:

Now, thou poor god, within this hall  
 Where the blank windows blind the wall  
 From pedestal to pedestal,  
 The kind of light shall on thee fall  
     Which London takes the day to be:  
 While school-foundations in the act  
 Of holiday, three files compact,  
 Shall learn to view thee as a fact  
 Connected with that zealous tract:  
     'Rome—Babylon and Nineveh.'

Even more clearly it can be seen in the whole of William Morris's craftsmanship with its return to the Middle Ages and a complete distrust of a machine civilisation based upon modern technology.

Morris frequently gave vigorous expression to his hostility to the industrial society which technological development had made possible. A typical passage is to be found in an article *injustice*, written in 1896, the year of his death:

I cannot help saying, by the way, how deadly dull the world would have been twenty years ago but for Ruskin! It was through him that I learned to give form to my discontent . . . Apart from the desire to produce beautiful things, the leading passion of my life has been and is hatred of modern civilisation . . . The struggle of mankind for many ages had produced nothing but this sordid, aimless, ugly confusion. Was it all to end in a counting-house on the top of a cinder-heap, with Podsnap's drawing-room in the offing, and a Whig Committee dealing out champagne to the rich and margarine to the poor in such convenient proportions as would make all men contented together, though the pleasure of the eye was gone from the world and the place of Homer was to be taken by Huxley?

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Against this he placed that ideal world, which was based on craftsmanship and which in his more optimistic and romantic moments he imagined as once existing in the medieval past. So in the *Prologue of The Earthly Paradise*:

Forget six counties overhung with smoke,  
Forget the snorting steam and piston stroke,  
Forget the spreading of the hideous town;  
Think rather of the pack-horse on the down,  
And dream of London, small, and white, and clean,  
The clear Thames bordered by its gardens green.

The clearest and ultimate statement of this position was to be found in Samuel Butler's *Erewhon* where the case against mechanism is outlined with a satiric emphasis. All the admiration that the eighteenth century showed for Newton, Wordsworth's wide if cautious interest, Coleridge's intermittent enthusiasms, and Shelley's exaltation, all these had now disappeared.

There remained only the evolutionary concept of the nature of human life and its origins which had so deeply affected the mind of imaginative writers and left them uncertain and isolated.

## XIII

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There were some attempts in the nineteenth century to accept evolutionary theory and to attempt to adapt it into a modern and ethical system. That would appear one of the major purposes of Meredith's more philosophical poems. He appears in *The Woods of Westermam* (1883) and *Earth and Man* (1883) as a didactic writer who would urge the possibility of an adjustment of human conduct to the ways of nature or 'Earth'.

In these and similar poems he reconstructed a complete, personal faith based on his own interpretation of evolution. He saw all life beginning in 'Earth', and man's error as his attempt to assert himself as a separate creation. From this pseudo-biological background Meredith developed his own moral philosophy of 'Common Sense' of the proper union of the mind and the body. It is all highly personal, a determination, ever dangerous, to solve the whole problem of creation in one's own time. Its weakness lies in Meredith's optimistic affirmation of an element of goodness in nature. He ignored the tragic contrast between the ruthless struggle in nature, with the triumph of the 'best endowed', and the gentler, kindlier conceptions upon which man's highest aspirations towards civilisation have been based. The strength and major interest of the theory is that it provided a basis for Meredith's theory of 'comedy' which gave a consistent direction to his work, and whose values pervade the novels.

Meredith by the middle of the twentieth century has come to be almost unread as poet and novelist. T. S. Eliot

spoke very severely against him and that has led a whole, younger generation away from his work. Yet, whatever Meredith's limitations, he did attempt as few writers of his time to face up to the human consequences of evolutionary theory. In his poetry he showed how man's weakness has lain in his attempt to deny his biological origins. Man has used religion as a romantic attempt to escape from his biological position in nature. He has refined his feelings in order to escape into a world of sentimentality. All this is ultimately futile for Earth will ultimately demand that her own principles prevail. Contention in nature is inevitable, with the 'cherishing of the best endow'd'. Any attempt to obtain all knowledge is a sort of spiritual life. The true life is one which acknowledges Earth and man's place in the Universe and accepts the stern way by which Earth presents to man the fullness of life:

She winnows, winnows roughly; sifts,  
To dip her chosen in her source:  
Contention is the vital force,  
Whence pluck thy brain, her prize of gifts.

Difficult though the poetry may be and as full of hard and arbitrary terms as a medieval allegory I am yet convinced that it will recover from its present bleak neglect. The attempt that Meredith made at the reconciliation of science and poetry in his time will yet have its recognition.

## XIV

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The twentieth century has brought few fundamental differences in the relationship of the scientist and the writer. There have been some individually organised expeditions in the scientific field but they did not represent more than personal marauding raids which leave the main position unchanged. For instance, H. G. Wells caught the imagination of a new public in his scientific romances. They had great ingenuity and at times almost a prophetic quality. Further they were adorned with his lively sense of detail. But they made no new contribution to the position of the artist in an increasingly mechanised society. Indeed Wells himself seemed unmoved by pictures or music or sculpture and somehow contemptuous of the themes and designs which writers had previously respected. It can be urged that in one way he engaged the mind of his generation by his scientific optimism which at times became identified in his mind with a crude belief in progress. When he came to formulate a philosophy he was as personal as was Shelley and had as little scientific justification for his conclusions.

Wells's facile optimism belongs to the period before the first world war and no writer of the next generation was to share his ebullience, while he himself as the years passed became more distrustful of the universe, and ended in an atmosphere of gloomy prophecy that had in it an element of the morbid. Yet there was a continuing desire to see the meaning of human experience poetically defined, as can be seen in the popularity of Robert Bridges' *The Testament of Beauty* in 1929. The poem has never been accepted critically

as a major work and in some ways it returns to Meredith's desire of finding a personal solution but the attraction which it had for cultivated readers in the years after its publication shows that it fulfilled some deeply felt need.

The main development within the twentieth century has been the increasing uneasiness of the writer, the sense that he exists in a hostile society and that the powers of science are increasingly creating a civilisation in which he has little place.

One important result was the continuing strength, though under a multitude of disguises of the theory of 'art for art's sake'. Professor Rudolf Wittkower has examined the question, as far as the visual arts are concerned, in his lecture 'The Artist and the Liberal Arts'.<sup>1</sup> 'We have seen', he said, 'that, in antiquity and the Renaissance, beauty could not be conceived of as separate from the good and the true. But now, true or false, right or wrong, these were notions outside the province of art: beauty had become the result of an irrational creative urge of genius. Consequently beauty, and therefore art, appeared to be free from any purpose.'

'The definition of the artist as a member of a privileged group, as a kind of being elevated above the rest of mankind, is directly descended from eighteenth-century aesthetic theory; and if you . . . accept it without protest, it only confirms our indebtedness to the age of Hume and Burke. In fact, it is often not sufficiently realized to what a degree art today depends on the categories developed in the late eighteenth century.'

'During the nineteenth century the rupture between the old disciplines of the liberal arts became more acute. Those who studied the humanities turned to the pursuit of specialized problems and more often than not the expert, who now emerged, lost sight of the ulterior scope of his enter-

<sup>1</sup> Published by University College, London, 19£2.

prise. The scientist, relying on the absolute validity of sense data, believed that he had become master of the material world and that the solution of the riddles of the universe was within his power. Science, the handmaid of philosophy in Plato's hierarchy of values had no use for philosophy. The philosopher, once the interpreter of the Liberal Arts in terms of final truths, retired behind the iron curtain of formal logic or idealistic subterfuge. And, as Aldous Huxley expressed it, the artist no longer aimed at art for God's sake, but at art for art's sake.'

Much of Professor Wittkower's argument applies to literature and is valid for the twentieth century as well as the nineteenth. The scientist and the writer will be found to possess a similar temperament and the qualities which lead to achievement in science are very different from those that lead to success in literature, but it would be unhelpful to try and simplify the issue unduly, as far as the twentieth century is concerned. The scientist has become less absolute in the assertion of his own purposes, and, if I may venture an opinion, uses more than ever his powers of imagination and his gift as an artist. Yet while the scientist exercises a gift which can be properly called imaginative his imagination is more closely controlled by experiment than that of the writer. For this reason there are likely to be wide divergences of temperament between the artist and the scientist.

The conception which Bacon seemed to advocate that science was merely a generalisation based upon experiment is false. The system of the scientist is rather to 'imagine a conclusion and then test that particular area of imagination by experiment'. It would be false to confine the use of the term 'imagination' exclusively to the artist, but what the scientist does with the results of his imagination is more confined than the activities of the artist.

The common ground between the scientist and the artist

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is that they, in the same way as the mystic, are engaged with experience. The mystic is satisfied with the experience itself, the artist is attempting to express the experience in its own terms, and the scientist is trying to see experience as a connected system. In this sense both the artist and the scientist employ imagination. The artist is freer than the scientist for he is not controlled by a system. As Professor Herbert Dingle suggests<sup>1</sup> the artist uses imagination merely to express, and thereby re-create in others, the experience that impresses him. His imagination has freer scope than that of the scientist, and he can mix his metaphors as much as he likes, as for example 'it is a dying lamp, a falling shower'. But the scientist must construct a single world of the imagination that expresses the relations which he finds between one experience and another. For example, Newton's universal gravitational forces, Faraday's lines of force, Einstein's world curvature, are all pure creations of the imagination whose form is severely limited by the necessity of conforming to all the experience available of the kind that they cover. The great scientists have, in fact, been men of strong imagination, as for instance, Lord Rutherford who once said, 'What, no such things as atoms! Why, I can see the little beggars'.

Professor Dingle suggests to me that the reason why the scientist tends to be scorned by the poet is that he inevitably concerns himself with experiences which the poet regards as trivial. 'Thus Galileo rolled balls down slopes, the early electricians attracted bits of fluff with rubbed glass rods, and even today it is only such unexciting things as the positions of pointers on scales that can be satisfactorily related with each other. We are just beginning to deal with

<sup>1</sup> In the paragraphs which follow, I am indebted to a communication by my colleague, Professor Herbert Dingle: in part, and with his permission, I use his exact words.

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the more difficult and important experiences now that psychology is becoming scientific, but it will be a long time before the experiences in which the poet is most interested will be related together scientifically. The poet has succeeded in expressing the deepest experiences; the scientist has so far succeeded in contacting only the most superficial ones. The scientist has, however, the slight compensation that his conclusions can be verified by anyone, for he deals with elementary sensations that all can share: the poet can be appreciated only by those who are potential poets themselves.'

The artist is not governed by these restrictive forces that define scientific imagination. He can explore the previously unapprehended relationship of things. Yet his very freedom has its difficulties. For while the work of science is accumulative, the artist is always having to make a fresh start. A young scientist can begin where the last of the great scientists that preceded him left off. But the artist cannot inherit the past so easily. Naturally he is dependent upon the past, and all art however original has in it strong elements of imitation. But what is essential for the artist in the composition of his work he must fight to gain for himself out of experience. What he gets may not be—indeed is not likely to be—as good as the best in the writers of the past. As Professor Gwyn Jones, who is a novelist as well as a critic, commented on this part of my argument, 'Writers are troubled by their awareness that almost everything they have to offer has already been offered before. This is in no sense a parallel with the eighteenth-century discussion about the Ancients. My own novel *The Flowers Beneath The Scythe* is about to appear; and if I care to think of *War and Peace* I could run on to the hill and hide in a rabbit hole.' The young scientist may achieve nothing at all but if he does achieve something he will be adding to the sum of know-

ledge. The young artist may, as Gwyn Jones has suggested, be floundering in some effort that can bear no comparison with work which the great masters have already achieved.

In the modern period and despite the increasing modesty of individual scientists, science has increased in power and prestige because by a combination of experiment and imagination its conclusions have been accumulative, while the artist has found his position declining because the types of experience which nourish him are apt to be dimmed out within a technological civilisation.

## XV

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Despite the difficulty of combining the function of the scientist and the artist within one personality, some scientists have shown a very considerable appreciation of the arts, while others, who have failed in their understanding of the arts have regretted the loss.

Sir Humphry Davy had not only an interest in the arts, he practised the art of verse. Coleridge said 'if Davy had not been the first Chemist, he would have been the first Poet of his age', though there is little evidence from Davy's own verses to support that view. Southey said that 'Davy was a most extraordinary man: he would have excelled in any department of art or science to which he had directed the powers of his mind. He had all the elements of a poet: he only wanted the art. I have read some beautiful verses of his.'<sup>1</sup>

One of the most genial pictures of Davy is given of him by Lockhart as he appeared in the company of Sir Walter Scott at Abbotsford: 'each strove to make the other talk—and they did so in turn, more charmingly than I have ever heard/

An example of a scientist, so completely absorbed in his investigations that all else is neglected, can be seen in the life of Henry Cavendish.<sup>2</sup> He inherited great wealth so that no economic motive intruded on the labours, and he lived so frugally that he was able to leave a million pounds to his relatives, in whom he had previously taken no interest and

<sup>1</sup> T. E. Thorpe, *Humphry Davy, Poet and Philosopher*, 1896. p. 217.

<sup>2</sup> *The Life of the Hon. Henry Cavendish*, by George Wilson, 1851.

who were certainly not interested in him. If only Cavendish had possessed a little more imagination he might have left his great fortune for the endowment of science and the whole future of England might have been changed. He worked from a passionate attachment to investigation, an attachment as complete, absorbing, and intense as that of a creative artist. Silent, lonely and unsociable he worked with a singleness of purpose, exact in detail, accurate in calculation, ingenious in experiment, and with ever a strong and illuminating imagination guiding him as he broke his pathway into new knowledge. The little that one knows of his temperament suggests that in its oddities, its powers of concentration, and its creative intuition it had much akin to that of the artist and to men of genius.

Sir Humphry Davy, speaking of Cavendish's experiments said that they 'were all of a finished nature, and though many of them were performed in the very infancy of chemical science, yet their accuracy and beauty remained unimpaired'. It was Cavendish who discovered 'inflammable air', which we now know as hydrogen: he isolated nitrogen from the air, and showed that in some way a small part of it was different from the rest, and thus he anticipated Sir William Ramsay's discovery of *argon*. He made the famous Cavendish experiment on gravitation on which modern science has made only minor improvements and adjustments.

Shy, morbidly unwilling to enter into any of the pleasures of society, with a feeble and hesitating voice, with no known interest in literature in any of its forms, or in any of the sensuous delights that nature, or art, or experience can give, he yet had something as powerful and consuming as the inspiration of a creative writer, whatever may have been the differences between the two activities.

He was as much a genius, and he lived as much in a life of imagination as any writer. Yet however great the imagina-

tion there must be, for the scientist, a period of analysis, prolonged and exacting, and this is removed in its method and discipline from the world of the arts. The artist has, of course, his period of 'taking pains', of struggling with his medium but even at this stage of his labours he has far greater freedom than the scientist in the period of experiment, though one may register a regret that the lives of scientists are far less fully documented than those of artists and men of letters. Probably this is inevitable, for the writer is able to exercise his own professional talent in his correspondence, or in writing about himself. The imagination of the scientist does not normally lead to memoir writing, or autobiography.

Cavendish is, of course, an extreme instance. Some scientists have begun with a full understanding and enjoyment of the arts, but have felt these claims weakening as the growing attractions of their own experiments and discoveries have claimed them. Their experimental work has become so absorbing, such a combination of discipline, surmise, and invention that it extends over their whole mind an all-powerful influence. Yet few scientists have expressed any sense of pleasure at the decline within them of an awareness of the arts, following their concentration in their own studies.

There is a revealing paragraph in Darwin's *Autobiography*<sup>1</sup> where he summarised his own experience: 'I have said that in one respect my mind has changed during the last twenty or thirty years. Up to the age of thirty, or beyond it, poetry of many kinds, such as the works of Milton, Gray, Byron, Wordsworth, Coleridge and Shelley, gave me great pleasure, and even as a schoolboy I took intense delight in Shakespeare, especially in the historical plays. I have also said

<sup>1</sup> *The Life and Letters of Charles Darwin*, London, 1887: Vol. I, p. 100-102.

that formerly pictures gave me considerable, and music very great, delight. But now for many years I cannot endure to read a line of poetry: I have tried lately to read Shakespeare, and found it so intolerably dull that it nauseated me. I have also almost lost my taste for pictures or music. Music generally sets me thinking too energetically on what I have been at work on, instead of giving me pleasure. I retain some taste for fine scenery, but it does not cause me the exquisite delight which it formerly did. On the other hand, novels which are works of the imagination, though not of a very high order, have been for years a wonderful relief and pleasure to me, and I often bless all novelists. A surprising number have been read aloud to me, and I like all if moderately good, and if they do not end unhappily—against which a law ought to be passed. A novel, according to my taste, does not come into the first class unless it contains some person whom one can thoroughly love, and if a pretty woman all the better.

"This curious and lamentable loss of the higher aesthetic tastes is all the odder, as books on history, biographies, and travels (independently of any scientific facts which they may contain), and essays on all sorts of subjects interest me as much as ever they did. My mind seems to have become a kind of machine for grinding general laws out of large collections of facts, but why this should have caused the atrophy of that part of the brain alone, on which the higher tastes depend, I cannot conceive. A man with a mind more highly organised or better constituted than mine, would not, I suppose, have thus suffered; and if I had to live my life again, I would have made a rule to read poetry and listen to some music at least once every week; for perhaps the parts of my brain now atrophied would thus have been kept active through use. The loss of these tastes is a loss of happiness, and may possibly be injurious to the intellect, and

more probably to the moral character by enfeebling the emotional part of our nature.'

Darwin's emphasis was that he did not appreciate a literature that drew him away from the concentrated analysis which his own investigation required. All he could accept were novels 'not of a very high order', which left his mind free. But there is no suggestion in Darwin that the arts are other than desirable, and their loss to be regretted.

When one comes to the other side of the picture and studies the artist's relation to science one discovers, as has been observed, at times an active antagonism to science breaking in. The reactions of Keats have already been noted. One has to admit that he was not a scientist at work in his own independent way in a laboratory as was Cavendish, nor had he any independent talent in science. He was a medical student slaving away for his apothecary's certificate and the end of an economic servitude which success in his examinations would bring. He had to do all this in a period when the conditions of the hospitals must have been nauseating to one of his sensitiveness. Still he was a man of keen analytical intelligence, and he laboured honestly, but once the examinations were over, and the apprenticeship finished he closed his mind to science for ever. He kept his medical books, and, as I have noted earlier, occasionally spoke respectfully of them, but all his energies lay elsewhere, and his science and medical studies were barred from his romantic imagination.

The last figure in Europe to attempt in any way to keep a position of command in both the sciences and the arts was Goethe. Goethe tried both, with that astounding energy which he possessed. His science was arbitrary and subjective as can be seen in his attack on Newton. He regarded his views on colour as so important that he was led to affirm: 'I do not attach importance to my work as a poet, but I do

claim to be alone in my time in apprehending the truth about colour.' Yet it is here, whatever may be said of his views on botany and his general scientific theories, that his work was useless. Goethe at times spoke with a language very similar to that of Keats. I quote from the *Wanderjahre* and I use Professor Andrade's translation:

Friends avoid the darkened chamber  
Where light's pinched and pushed and trimmed,  
Where the miserable chapter  
Bow before the falsehood limned  
Sham and superstitious preachers  
Of false doctrine we despise:  
In the heads of these your teachers  
Leave the spectres and lies.<sup>1</sup>

Goethe's approach, as I have earlier suggested, was ultimately not scientific, but governed by his own determination to seek in his own life-time the ultimate solution of things. He imposed his own solutions on matter instead of exploring matter to see what solution it would yield.

The contemporary period has not been without examples of outstanding scientists who have also been poets. The most remarkable was Sir Charles Sherrington who in 1925; issued through the Oxford University Press *The Assaying of Brabantius and Other Verse*. I will not quote the best or indeed the most typical verse in that unexpected volume but a sonnet, entitled *The Body of Man*, which shows how Sir Charles Sherrington used his scientific knowledge in the composition of his poetry:

Ribbed breathing flesh, thrice often crucified,  
Veined vase of life, the wheeling universe  
has shapen thee, for better or for worse

<sup>1</sup> *Goethe, the Alchemist (1953)*.

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and still is shaping, out of old Earth's side.  
Launched from primeval clash of rock and tide  
thence thither on, with wayfaring perverse  
thy fashioning still goes forward even as their's  
the stars in flow that sphere from vapours wide.  
How earnest thou by that strange gift ungiven  
to aught else earthly, Eden's fruit forbidden  
to know thyself, as part to glimpse the whole  
And, that within thee, clasping earth and heaven  
for comrades of like faring, storm beridden  
to face, brow-raised, the incognizable goal.

Whatever may have been the attempts of the informed scientist to understand or even to practise the arts, it is difficult to deny that the power and prestige of the scientist has increased while that of the artist has declined. This domination of the natural sciences has been re-emphasised by the development of the science of psychology and later psycho-analysis.

## XVI

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A psychological influence was present in literature before it was regulated by the exact terms of a separate science. It was true that the term 'psychology' had been used as early as 1693, but then as a study which deals with the soul, as opposed to anatomy as the study of the body. Apart from this reference, it would appear that one has to wait for David Hartley's *Observations on Man*, until one finds a definition which approaches modern usage.

Meanwhile the thought that leads to modern psychology can be found in the late seventeenth century in the influence of Locke's philosophy, unless one is to lead the argument back, as so many arguments can be led back, to Hobbes. Locke had increased the proportion of reason in human life by limiting the range in which the imagination could move with freedom. It is significant that Locke's philosophy coincided chronologically with the development of science through the Royal Society. He was leading artists, as was the development of science, to seek a new way of writing, less dependent on the illimitable suggestion of myth and the romantic imagination, but more orderly, and logical and restrained.

Dryden answered here the spirit of the age with the critical and analytical approach which dominated his genius. Already in Dryden one can see a critical introspection arising from his knowledge of Locke. In the *Epistle Dedicatory to The Rival Ladies*, in a language derived from Hobbes, he gave for the first time in our critical literature, an account of the poet's activity, akin to those found in contemporary

theories of the unconscious. 'Fancy', he wrote, 'was yet in its first work, moving the sleeping images of things towards the light, there to be distinguished, and then either chosen or rejected by reason.' Here was the beginning of introspection applied to literary creation, the self-conscious observation of the literary process for its own sake, and a reliance upon technique which is in danger of overwhelming the imagination. By the nineteenth century, and once again particularly in the work of Coleridge, all this had developed in importance. As I have already suggested, part of the atrophy of Coleridge's poetic genius comes from his acute introspective talent so that self-consciousness about the nature of the instrument nullifies the shaping power of the imagination.

I would discover here a third and even more insidious reason for the increased subservience of the writer in the modern period. In our own time when social and political systems are in a state of violent flux, the writer has so often found the necessity, partly to justify to himself his own importance, of attaching himself to some ideology or to some fixed approach to life. Admittedly much of the greatest artistic work has been achieved by writers who have discovered themselves either by heredity or by personal exploration or conversion within some satisfying faith. But this is different from a self-conscious adoption and almost exploitation of a set position, by writers who began with a free and more detached approach.

Aldous Huxley and T. S. Eliot are two examples. What any unprejudiced mind must observe is the decrease of creative energy as the fixed and obligatory outlook of a dogma increases. Their achievement may be contrasted with that of Thomas Hardy, who retained the 'destructive' element in his imagination, and equally a continual strengthening of his own vision. In Huxley or in Eliot there is an

element of surrender, and consequently their art suffers. The political loyalties, developed among some younger writers to almost a propaganda level have a similar effect. The artist must retain freedom of vision in relation to experience.

Although the status of the writer has thus declined I would not suggest that his own statements about his position are accompanied with any degree of modesty nor even, always, of an awareness of his own changed position. Indeed, at this very period when the place of the art of literature in our civilised life is decreasing, the claims of some writers are becoming bold, arrogant and excessive.

It was in the eighteenth century, when the range of the imagination seemed to be diminishing, that 'Creative' as applied to literary achievement was substituted for the earlier, modest and classical word 'imitative'. It was Dryden who first applied the word 'creative' in writing of Shakespeare's Caliban, and the term remained: there is something ironic in the context from which the word starts on its fong, ambitious and complex journey. It was thus in a period when imaginative literature was, as it were, struggling for its own right within the whole system of thought and life, that criticism was led to make more extravagant claims as to its importance.

The process continues, so that while the range and importance of imaginative literature declines the actual quantity of critical work increases, and so do the claims of the critics. The position has reached an extreme in relation to T. S. Eliot. There is no parallel in our literature for the great volume of critical literature that has appeared around the work of a living writer.

In the romantic situation there are already indications of the danger. Wordsworth's claims for poetry, in his Prefaces, were far bolder than those of Sir Philip Sidney in the six-

teenth century. Coleridge was lost to poetry by his philosophy and criticism. Keats maintained, fortunately, a balance between poetry and comment, and the comment was kept informally to his letters. Yet even in Keats the mind appears more mature in the letters than in the poetry. Of all the poets of the romantic period Shelley made the most extravagant and undefended claims for poetry, asserting that 'poets were the unacknowledged legislators of the world'. Later, in the nineteenth century, when all the productions of industrial society were joining in unison to prove that it was not true, O'Shaughnessy made his dreary and unconvincing chant; that the 'music makers and the dreamers of dreams' were the 'movers and shakers' of the world.

## XVII

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The place of the creative writer, therefore, needs re-definition. He will not reform the world, nor save it, but he can interpret whatever is valuable within human experience, extending beyond the range of the observed to all that imagination can achieve, Thus even if his philosophy is one of pessimism he can echo Hardy's lines:

Let me enjoy the earth no less  
Because the all-enacting Might  
That fashioned forth its loveliness  
Had other aims than my delight.

In this then, would lie the new humanism, in the frank admission that religion and philosophy, and science have their place, and that literature cannot supersede them. At the same time by extending the range of inspiration beyond the cloudy and uncertain oracle of the private unconscious and admitting into easy acceptance the stream of images that emerge, the writer could assert his place in a social and spiritual relation to mankind. Nor would he use his art either as a weapon of revenge against society or in slavish subjection to a system.

My suggestion is that the writer should be, at once, more knowledgeable and more independent. I would quote again from Professor Rudolf Wittkower's lecture on *The Artist and the Liberal Arts*: 'In England', he said, 'the most uncompromising advocate of the "art for art's sake" principle was the Anglicized American Whistler. He wrote in 1878: "Art should be independent of all clap-trap—should stand alone,

and appeal to the artistic sense of eye or ear, without confounding this with emotions entirely foreign to it, as devotion, pity, love, patriotism and the like". He insisted on calling his pictures "symphonies", "arrangements", "harmonies", since the success of a picture should not depend upon its subject nor upon its "dramatic, or legendary or local interest". Before the end of the century Oscar Wilde perverted this view and led it *ad absurdum*. If the perfection of art, he argued, consists in the purity of form, then form without purpose and without meaning alone has beauty, and hence "only he who has nothing to say can do beautiful work" !

The nineteenth century had of course to speak aggressively, as it was engaged in an attempt to release itself from the grim and solid didacticism to which so much literature was committed. The artist cannot be the utility agent of any morality or creed. He will inevitably attach an importance to human experience, and an importance to elements that are biologically or practically unimportant. He has an attachment to the human experience for its own sake, and only by his exercise of his talent can the mechanical and the routine in existence be restored to a multifarious sensation and endowed with all its sensuous variety.

I can define what I would desire by reference to two Victorian critics whose purposes tended to work out in very different ways, Walter Pater and Matthew Arnold. Pater led the writer outside the commerce of ordinary experience into some narrow world of aesthetic pleasure. Such a creed used the paid-up capital of human experience for the exercise of individual, aesthetic indulgence, an indulgence of an elegant and rarefied kind. Matthew Arnold on the other hand sought that poetry should be 'a criticism of life' and for that phrase, if rightly employed, we may be grateful. But the definition is not ample enough as

Arnold would employ it. He seems to shut out from poetry, and indeed from literature as a whole, the element of pleasure that comes from the enlargement of experience by the observation of all its moods and detail. Arnold was in danger of limiting the range of literature because he wished to keep it exclusively for certain high and priestly purposes. He followed up his definition that poetry is an 'interpretation of life' with claims for the importance of the arts and of poetry in particular almost as excessive as those Shelley had made.

'The future of poetry is immense', Matthew Arnold wrote, 'because in poetry, where it is worthy of its high destinies, our race, as time goes on, will find an ever surer and surer stay. There is not a creed which is not shaken, not an accredited dogma which is not shown to be questionable, not a received tradition which does not threaten to dissolve. Our religion has materialised itself in the fact, in the supposed fact; it has attached its emotion to the fact, and now the fact is failing it. But for poetry the idea is everything; the rest is a world of illusion, of divine illusion. Poetry attaches its emotions to the idea; the idea *is* the fact. The strongest part of our religion today is its unconscious poetry. More and more mankind will discover that we have to turn to poetry to interpret life for us, to console us, to sustain us. Without poetry, our science will appear incomplete; and most of what now passes with us for religion and philosophy will be replaced by poetry. Science, I say, will appear incomplete without it.'<sup>1</sup>

The dilemma of the modern writer has lain there between the narrow and self-indulgent arrogance of Pater and the sweeping but unjustifiable claims of Arnold. His difficulty has arisen from finding the one position no longer tenable and the other false. In their several ways both Arnold and

<sup>1</sup> *Essays in Criticism.*

Pater are advocating purposes in literature which would limit its range and possibilities. Once one tries to interpret Chaucer, or Byron, and above all Shakespeare, in the terms of this criticism, one can see on what narrow principles it is based.

All these considerations have weighed together to make the position of the creative writer in modern society, however sustained he may be by vanities and fantasy, a depressed one. He has been led to think of himself as a person apart, removed from society and outside the range of ordinary living. Yet he is aware of neglect, or of the presence of a hostile world. It would be desirable if, once again, he could enter into the fullness of knowledge in his time. As Professor Rudolf Wittkower says in the concluding passage of his lecture on *The Artist and the Liberal Arts* to which I have already referred, 'the genius of Leonardo has taught us that knowledge and inspiration are not mutually exclusive—that, on the contrary, neither can thrive without the other. Knowledge does not become a hindrance to inspiration if it is born—to use Einstein's word again—from a "hunger of the soul".' 'The past, I think, has taught us that without the fire of inspiration the liberal arts degenerate into dead scholarship, while the imagination of the artist without the backing of the liberal arts is condemned to sterility:

*Scientia sine arte nihil est,  
ATS sine scientia nihil est.'*

In the modern period it has not been altogether helpful that psycho-analysis, the science which at first sight would seem to be most profitable to the artist, treats him as a neurotic. There is much in that science congenial to the creative writer and superficially instructive and encouraging to him in his labours. Freud, as Lionel Trilling has reminded

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us, once confessed that 'the poets and philosophers discovered the unconscious'. 'What I discovered', he added, 'was the scientific method by which the unconscious can be studied.' Yet, though he comes as a friend, Freud's ultimate attitude towards art is one of contempt. He has arrived by his own path at the position held by Bacon three centuries earlier. Art is 'substitute gratification, an illusion in contrast to reality'.<sup>1</sup> The artist must restore to himself all the strength which he gains from the unconscious when he uses it detached from the rigidity of Freudian science.

<sup>1</sup> *The Liberal Imagination*—Lionel Trilling, p. 42.

## XVIII

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Apart from these considerations there has been much in the general climate of our time to make the outlook of the creative writer more difficult. Western civilisation has gone through a period of stress which has left it spiritually inert. The manifestation of evil in the human mind which it has witnessed has destroyed, with no hope of immediate revival, the more optimistic and liberal vision prevailing in the nineteenth century. As a consequence sensibility both in the writer and the audience has also been numbed. The writer, unable to erect a positive and encouraging view of human life, has turned himself into a critic and a satirist attacking the whole inadequacy of human nature with a vehement bitterness. Much of the ugliness in contemporary art is this protest of the artist against the nature of human existence itself and of the conditions under which it has to be lived. This appears more obviously in pictorial art. The work which Picasso produced during the occupation in France had a sense of fantastic horror as if to emphasise the spiritual and physical experience through which France was passing at that time. The writer, though less dramatically affected, is under the same influences.

I would suggest that it is of great importance that neither the writer nor the audience, even if the audience has to be a minority audience, should accept this position. The writer should return with more confidence to that intuitive study of the human mind and of human experience which is his own special approach, treasuring any moment which might have a comeliness of shape or form or idea. He should

detach himself from self-imposed responsibilities as Messiah, theologian, and politician which he has too easily adopted. He should move among men of science and move more widely among all those who traffic in the affairs of the world, but he should do so aware of his own purpose and his own lively detachment.

For the generation which came to maturity in the 'thirties there have been special difficulties. They had devoted themselves, many of them, to a left-wing philosophy and some to communism. They had joined the anti-Franco struggle in Spain as the last romantic cause in Europe. That lost they had rallied themselves into a temporary and self-protective patriotism during the Second World War. That over they had hoped for a restoration of civilisation in the terms which they had once known it and particularly with the civilisation of France. The post-war world led them to such a severity of disappointment that they seemed unable to rediscover a world in which their creative talents could function freely.

The moods of that generation can be traced in the essays of its most authoritative spokesman, Cyril Connolly, particularly in the pieces which he gathered from his periodical *Horizon*, issued in the 'forties, into *Ideas and Places* published in 1953. It is an important document for anyone who will understand the problems of the writer in these years. Mr. Connolly, having expressed with a vivid warmth his longing during the war years for a re-association with France, describes how bleak had been the disappointment of the post-war years: 'Morally and economically Europe lost the war. The great marquee of European civilisation in whose yellow light we all grew up and read or wrote or loved or travelled, has fallen down; the side-ropes are frayed, the centre-pole is broken, the chairs empty, the roses are withered on their stands, and the prize marrows; the grass

is dead/ Mr. Connolly in 1953 would admit that all this is excessive and elsewhere in the volume he admits that 'on looking back, I think that perhaps I was a little crazy and that the idea of decadence hagged and haunted me, as if I were some Hebrew prophet/

The trouble of so many of that generation was that they were 'engaged' politically and that the literature they admired was an 'engaged' literature. As against this Mr. Connolly quotes a story of Valery which might serve as a text for much that I have been urging in this volume. He tells of how a young poet came to Valery and said that he could no longer enjoy a certain poem because it was not *la Literature engagee*, and 'Valery replied, "What rubbish! There were always moments in the history of civilisations when literature seemed to have responsibilities—perhaps this was one of them—but they soon blew over", and as he spoke one felt that all the authority of the nineteenth century was behind the remark.'

## XIX

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I realise that there is no simple way of solving the problem of the contemporary writer by a return to the past, but yet it is only from a study of the past that tradition can be maintained, and it is only through tradition, particularly in a harassed, harsh and tragic period such as our own that a conception of the civilised life can be maintained. Further, tradition must not be narrowly interpreted in order to fit the principles or the prejudices of any particular school.

I would then postulate, in the first place, as the element which is fundamental to the writer, an appreciation of the value of the individual and of his own experience. In this tragic era of ours this may require an effort of will. But other generations have lived in difficult and tragic times. I am frequently reassured by thinking of Keats, for Keats's experience was different from that of Pater. Not for him the easy path of nineteenth-century Oxford, but the hospital wards in the days before anaesthesia, when the daily sights were of a character so harrowing that in our own time only those who have seen action in war can have known a parallel. Yet Keats was able to assert: 'I am certain of nothing but the holiness of the Heart's affections and the truth of Imagination—What the imagination seizes as Beauty must be truth—whether it existed before or not—for I have the same idea of all our Passions as of Love they are all in their sublime, creative of essential Beauty.' It was in the same letter that Keats fell upon the miraculous phrase: 'Men of Genius are just as certain ethereal Chemicals operating on the Mass of neutral intellect.'

I know that this cannot be easily maintained today. No writer of today can gain that deep excitement in experience and reassurance about life which Keats could gain from the natural sights around him and from the reading of poetry. Nor can the contemporary artist be expected to discover his point of departure in the romanticism of the early nineteenth century. We are so bemused by the image of cosmic disaster that the value of the individual experience is in danger of seeming insignificant. This is a phenomenon which would seem to have no parallel in the experience of any earlier generation. But this only emphasises the importance of the reassertion by the artist of the permanent value of the individual experience.

Even in Western Europe we live in societies where the central authority disregards the independence of the individual life, even though that central authority may employ a democratic nomenclature. All the more is the reason why the writer should reaffirm the individual's independence at least in his sensuous, emotional and spiritual life. This may, at first sight, appear a contradiction of what I have said earlier of the advantages the artist would derive from not being politically engaged. I would, however, distinguish the active, and propagandist, adherence to some political dogma, and the maintenance against all state authorities of that degree of freedom in the individual life without which art cannot flourish.

The optimism of the romanticist has been afflicted, as I have suggested, by the re-emergence in our time of evil in all its primitive and dynamic force. But our need is the stronger for the writer to remind us that man has known good, and has conceived beauty; that he does not solely live in the cruelty and baseness to which his nature can degrade him. 'What a piece of work is a man! How noble in reason! how infinite in faculty! in form, moving, how

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express and admirable! in action how like an angel! in apprehension how like a god! the beauty of the world! the paragon of animals /' Yet Hamlet, who made this tribute to man, had the power, more than any other character in Shakespeare, of anatomising evil.

## XX

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In attempting thus to re-establish tradition by re-defining humanism as I have been calling it, I find much that is suggestive in the life and experience of W. B. Yeats. For he, especially in his younger days, was immersed in a tradition of beauty, of elegance, and magnificence which so many modern writers have resisted. 'I was', he wrote of that youthful period, 'in all things Pre-Raphaelite.' He departed from the narrow but delectable aestheticism of his youth; Pater was not enough, and he associated himself with the tragic vision of his own age.

He was never consoled by the weak-sided elements of Liberalism, by any run from some single and benign committee room. Tragedy, cruelty, these are in life, but not with the sordid and the mean as their sole and necessary accompaniment. Even in the ultimate distress there can be a moment of magnificence, and the identification of that moment is the poet's function, the holy tryst that he keeps with mankind. So in the time of the 'troubles' in 'Easter, 1916', Yeats comes to write:

I have met them at close of day  
Coming with vivid faces  
From counter or desk among grey  
Eighteenth-century houses.  
I have passed with a nod of the head  
Or polite meaningless words,  
Or have lingered awhile and said  
Polite meaningless words,  
And thought before I had done

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Of a mocking tale or a gibe  
To please a companion  
Around the fire at the club,  
Being certain that they and I  
But lived where motley is worn:  
All changed, changed utterly:  
A terrible beauty is born.<sup>1</sup>

Much in Yeats is difficult, especially difficult for the non-Celtic mind to understand. But even when all that is troublesome has been discarded so much remains that will help in sustaining the writer in a faith in his own humanity. For Yeats showed a way, how without dogma, the poet can re-affirm a value in life and a depth in experience. He marked out a territory for the writer which is distinct from that of the rationalist or man of science. It is from such a background that the new humanism might develop. We must return to the ancient sources of wisdom in the art of literature and in the world of the imagination, uniting what we can achieve in our own time with the past.

Yeats described how he had been reading Boccaccio and Cervantes and come to feel that they are of one world: 'It is we who are different', he wrote, and he went on to explain this difference by the intrusion of 'newspapers, all kinds of second-rate books, the pre-occupation of men with all kinds of practical changes' which 'have driven the living imagination out of the world.' Boccaccio and Cervantes 'had not to deal with the world in such great masses that it could only be represented to their minds by figures and by abstract generalisations. Everything that their mind ran on came to them vivid with the colour of the senses, and when they wrote it was out of their own rich experience and they found their symbols of expression in things that they had known all their life long'.<sup>2</sup>

<sup>1</sup> *Collected Poems* (Macmillan).

<sup>2</sup> *Ideas of Good and Evil*.

I know that much has been written about the relation of literature to belief, and of the necessity of honesty in the contemporary writer in portraying life as he sees it. Against this I maintain that too often the experience of the artist has been too narrow, and often it is because it is narrow and not from a depth of vision that bitterness arises. How many contemporary poets can claim an experience as wide as that of Chaucer, or Spenser, or Coleridge, or Byron in relation to the life of their time? Too often modern literature is the writer's announcement of his revenge on a society from which he is alienated. Technique remains in excess of experience for technique is the satisfying link with the material and scientific world.

Much in modern life has an ugly shape and the genuine attachment to realism, which must be distinguished from a morbid attachment to the ugly, is to be commended. But ugliness should not be allowed to deny the moments of transfiguration in experience, the moments to which Wordsworth, the greatest of our modern poets, gave testimony. 'The holiness of the heart's affections' has been a theme of English poetry for six hundred years. Shall we barter all this for the shapeless and private contemplation of the unconscious? Even if the temper of our time will not make the approach, which I have been outlining, commendable, or permit its reproduction, the tradition of English poetry would be weakened if our criticism did not reassert its existence.

This wide contact with human experience has been a consistent part of our poetry and fiction and nothing in our literature has affected our national spirit more closely, so that even those who have not heard the names of Spenser, or Shelley, or Keats, or Yeats, have had their lives in some intangible way transfigured by the fact that great minds have captured this transient but recurring splendour of life

into poetry, along with a steady and firm contemplation of whatever evil or corruption it reveals.

In attempting to define the humanism I have in mind I have referred to Keats, and to Wordsworth and Yeats, but it can be seen most clearly in Shakespeare. In a country where the consciousness of class division was strong he discovered how, within a single play, pleasure could be given to the crowd through farce and a strong plot, and to the most discriminating by a subtle analysis of character or by a vital alertness of his language. He appealed to the moral attachments of his countrymen by frequent speeches on themes nurtured by didacticism, and yet he gave to his characters freedom, in their nobility and evil, to traffic as they would wish.

He was ever conscious of the divine ordinance to the universe, and yet he never intruded one view of dogma or theological instruction as a preliminary obligation on his audience. He seems to have been able to conceal his own personality in order to create the world which the play in hand demanded. This universality of awareness is co-extensive with that which Tolstoy displayed in his novels, but Shakespeare seems less committed than Tolstoy to a particular moral code. He does not seem in Keats's phrase to have any 'palpable design' on us. Yet his art maintained a consistent relation to ideas, a vision which varies from one play to another but maintains an underlying consistency.

The unconscious makes a supreme contribution to Shakespeare's art, but with him it is not subject to the findings of psycho-analytical science nor is it a private diary recording a stream of association. With him the unconscious becomes available to the conscious mind through imagery and metaphor. Here is the ultimate contribution of poetry to human experience. For at its highest, imagery, by drawing together widely separated objects and experiences into a brief and

unlaboured expression, asserts the unity of human life. The poet, though often not consciously, is affirming that behind all the conflict of contrasting appearances there is a single life of the spirit. Metaphor is the applied metaphysics of poetry. Imagery in its purest form is mysticism made manifest from sources that depend on ordinary experience. In such an approach I would then discover the humanism which the artist may regain through tradition and apply to the needs of our own time.

From the scientist one would seek a wider act of interpretation, both of the nature of the scientific imagination and of the discoveries and possibilities of modern research. From the artist the demands towards the new synthesis may, possibly, be even more fundamental. He must in the first place be awake to a consciousness of the new world which science has made, the new types of knowledge which are available. He is in danger of relying upon an old and conventional interpretation of life and experience when new and exciting conceptions have already been disclosed. If science has failed to register its responsibility in relation to humanity this is still more true of the artist. The scientist is far more industrious and far more patient. He will spend days and nights observing the habits of some animal which he is investigating, in a way which the artist would consider too undignified for his high office. There is much to be gained by a wider communication between the scientist and the artist and they should seek out some area of common understanding based on a faith in man had in his destiny. They should also be conscious that they have their own and separate ends to fulfil.

The writer can remember that whatever power and dignity may surround other disciplines his art is the nearest approach to an interpretation that man has of the nature of his own experience given in the terms of that experience.

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For the creative writer by the alertness of his own intuitions can define with colour and liveliness the shape and pressure of ordinary experience and suggest, if only intermittently, the existence of a life of the spirit, and by the discovery of significant form, and of beauty, can reveal to man that human life has a quality beyond the elements from which it is made.



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