

## 1.1 The Effect of the Scientific Temper on Man

Bertrand Russell

1. The men of the seventeenth century who invented the modern scientific method had an advantage over their predecessors in a new mathematical technique. But, in addition to this technical advance, there was another advantage almost more important. Before their time, observation had been haphazard, and baseless traditions were accepted as if they were recorded facts. The laws which were invented to account for phenomena were not legitimate inferences from observation, but were infected by a belief that nature conformed to human tastes and hopes and fears. The heavenly bodies were supposed to move in circles or complications of circles, because the circle appealed to aesthetic taste as the perfect figure. Pestilences and earthquakes were sent to punish sin. Refreshing rain was sent as the reward for virtue. Comets foretold the death of princes. Everything on earth and in the heavens had reference to Man or to aesthetic tastes which closely resembled those of human beings. 5
2. The scientific temper abandoned this point of view. To find out how nature works, we must forget our own hopes and fears and tastes, and be guided only by careful investigation of facts. Although this may now seem a simple idea, it was, in truth, revolutionary. When Kepler discovered that the planets moved in ellipses, not in circles or epicycles, he dealt a death-blow to the interpretation of nature through the medium of human emotions. The essence of the scientific attitude thus inaugurated is this: Nature does what it does, not what we should wish, nor yet what we should fear, but something blandly unconscious of our existence. *not interesting* 30
3. From the realization of this fact, the modern world, for good or evil, has inexorably developed. It is, I repeat, a curious circumstance that most of the men who are thought in the West to be embodiments of Western

culture are ignorant of this development, which was due, at first, to a tiny minority and is still, in the main, confined to people whom their literary counterparts regard as narrow and uncouth specialists. ✓ 35

4. It is not pure science, however, but scientific technique which represents most fully the influence of the West upon mankind. The Industrial Revolution, which is still in its infancy, began in a humble way in Lancashire and Yorkshire and on the Clyde. It was hated in the country of its origin by most cultured gentlemen, and was tolerated only because it contributed to the defeat of Napoleon; but its explosive force was so great that, by its own momentum, it spread first to the other countries of the West and, later, to Russia and Asia, which it is completely transforming. It is this, and this alone, that the East is willing to learn from the West. Whether the discovery of this kind of skill is to prove a boon or a disaster is, as yet, an open question. But, whether for good or ill, it is scientific technique that is the main cause of the changes that the world is undergoing. 40 45 50

Bertrand Russell, *Fact and Fiction* (Allen and Unwin, 1961)

### Aids to Comprehension:

aesthetic — in agreement with principles of good taste.  
 pestilences — fatal epidemics.  
 temper — disposition of mind.  
 inexorably — relentlessly.

Q. I Which of the following statements are consistent with what the passage says?

A. Men of the sixteenth century

- a. believed that earthquakes occurred whenever man sinned.
- b. believed that heavenly bodies moved in circles because of gravitation.
- c. believed that nature acted in accordance with man's tastes and hopes and fears.
- d. believed that comets appeared before the death of a king.

B. Men of the seventeenth century

## 5.5 The Aims of Science and the Humanities

Moody E. Prior

27. There are certain differences between the methods and aims of science and the character of its distinctive products compared to those of the humanities. It is important to insist upon them because the tendency in much of the present-day discussion of these matters has been to obliterate or obscure these differences. 5
28. Among these differences, one of the most conspicuous is that, unlike the sciences, the humanities are concerned with emotional responses to experience and they evoke these responses. And this is true of all the arts and in varying degree of most humanistic writing. Another difference is that the humanities address themselves to an understanding and an evaluation of human goals, and this, while less apparent with the most abstract arts like music, is especially apparent in all forms of humanistic discourse. By comparison, a scientific generalization, whether a mathematical formulation, or a theory, or a concept, carries no implication within itself of its relevance to any human uses to which it may be put, to the human choices which may be governed by it, or to the inherent human striving for happiness or self-fulfilment in action except as it points to further scientific activity. The creations of science—its mathematical syntheses, its proven generalization, its fruitful concepts and theories—are neutral with reference to their moral and social implications. But with the humanities, the involvement in both the human meaning and response to the experiences and observation dealt with is inescapable and is inherent in all typical humanistic products. They could not, in fact, be described or defined without reference to these. 30
29. Science and the humanities share in common the capacity to arouse a particular form of aesthetic responses—the pleasure which is induced by those products of creative effort in which discrete elements of matter or experience are brought together in a meaningful organi- 35

zation. Even in connection with this aspect, however, there is a difference: it is possible to define a product of scientific activity without reference to this aesthetic aspect, but it is hardly possible to do so for a work of music or a poem. 40

30. There is a further difference. Though both attempt to discern and express order and unity in the variety of experience, their generalizing powers tend in different directions. Science attempts to subdue a multitude of incidents to a grand generalization which, until challenged by new events is universal in its application. Scientific generalization is capable of accurate prediction with reference to all future events that belong to the category of incidents with which it deals. Humanistic works, on the contrary, are concerned rather with the individual experience, and they relate it to general principles not in order to have it lose its identity within them but in order to reveal its special meaning. Humanistic works therefore tend toward uniqueness, and in their totality call attention to the diversity and plenitude of human experience. All sunsets can mean only one thing in any given statement about them in the science of physics. But to a painter each sunset is a distinct phenomenon to be given a special personal meaning in the whole range of sunsets and is capable of many emotional evocations. 60
31. Lastly, there is also a parallel difference in the resultant products of the two forms of creative activity. Whereas the products of scientific genius are in their final form impersonal, the products of artistic genius are unique and inseparable from the special powers of the one mind which produced them. 65

Moody E. Prior, *Science and the Humanities* (Northwestern University Press, 1962)

### Aids to Comprehension:

- obliterate—wipe out.
- aesthetic—pertaining to the appreciation of the beautiful, especially in the arts.

discrete—separate.

plenitude—abundance.

evoke—call up.

**Q. I** Drawing your information from the passage given above, answer the following questions in a short paragraph each. Use your own words.

- a. What is the most conspicuous difference between science and the humanities?
- b. Both the humanities and science find unity in a variety of experience. How do they make generalizations from these experiences?
- c. What is the difference between the creative products of art and science?

**Q. II** Write a short paragraph bringing out the similarities between the creative products of the humanities and science, with special reference to the role of the poet and the scientist. For information look at not only this lesson but also 5.1 and 5.3.

**Q. III** Analyse paragraph 30, and say how the three basic principles of paragraph writing have been utilized.

**Q. IV** Analyse paragraph 27, and say which technique has been utilized for writing this introductory paragraph. Give reasons for your answer.

**Q. V** Analyse paragraph 31, and say which technique has been utilized for writing this concluding paragraph. Give reasons for your answer.

#### Explanation I

These three techniques for writing concluding paragraphs, that is, using *signal words*, *returning to the introduction* and *reducing sentence length* may be used in combination, as is illustrated in the following paragraph:

32. So music that is itself seems on the whole better than music that reminds. And now to end with an important point; my own performances upon the piano. These grew worse yearly, but never will I give them up. For one thing, they compel me to attend—no woolgathering or thinking myself clever here—and they drain off all non-musical matter. For another thing, they teach me a little about construction. I see what

becomes of a phrase, how it is transformed or returned, sometimes bottom upward, and get some notion of the relation of keys. Playing Beethoven, as I generally do, I grow familiar with his tricks, his impatience, his sudden softnesses, his dropping of a tragic theme, one semitone, his love, when tragic, for the key of C minor, and his aversion to the key of B major. This gives me a physical approach to Beethoven which cannot be gained through the slough of 'appreciation.' Even when people play as badly as I do, they should continue; it will help them to listen.

E. M. Forster, 'Not Listening to Music,' *The World of Ideas: Essays for Study*, ed. Michael W. Alssid and William Kenney (Holt, Rinehart and Winston, 1964)

This is the concluding paragraph of an essay entitled 'Not Listening to Music.' The author begins his introductory paragraph with the sentence, 'Listening to music is such a muddle that one scarcely knows how to start describing it.' Within this paragraph, the writer mentions how he 'woolgathers' during most of the musical performance, and therefore the difficulties in actually listening to a whole performance. In the essay, he then goes on to describe how he listens to music during the short periods when he is not distracted. He describes music which is itself and also music which reminds him of some event, place or happening. Then comes his conclusion. As is evident, he uses *signal words*—'so' and 'now to end with an important point.' But he also makes a *reference* to what he said in the introduction—about woolgathering and listening to music.

Thus, a combination of two or more concluding techniques may also contribute towards making the ending of an essay effective.

**Q. VI** Write a concluding paragraph for the essay 'Causes and Effects of Population Explosion.' You have written its introductory paragraph and its outline in 4.5, Q. V. Combine two out of the three techniques mentioned, while writing your concluding paragraph.

**Q. VII** Write the introductory and concluding paragraphs for an essay on 'The Role of Advertisements in Our Daily Life.' First