

Sir Edward Appleton

SCIENCE AND THE HUMANITIES

I AM SURE that my two brother graduates will fully understand and indeed approve my special reference to the unique association of Edinburgh and Dalhousie Universities*; for Dalhousie I count to be Edinburgh's younger sister in the New Scotland. As is well known, the four Scottish Universities constitute a distinctive unit in the pattern of British University institutions. And if you ask me how the people of Scotland regard their own Universities, as compared with others, I shall refer you to a remark of Jeanie Deans, the simple lovable heroine of Sir Walter Scott's *Heart of Midlothian*. Many of you will remember Jeanie's long journey from Edinburgh to London, and how, at one stage of it, she is invited by an English clergyman to attend his evening service. Jeanie, a stout Presbyterian, hesitated somewhat; whereupon the Rector said to her, "You ought to recollect that the same Divine Grace dispenses its streams to other kingdoms as well as to Scotland." To which Jeanie replied, "Ay, but, though the waters may be alike, yet, with your worship's leave, the blessing upon them may not be equal." There you have, in a phrase, it seems to me—a phrase by no means boastful and yet tinged with a certain gentle pride—the way the Scots regard their own institutions and their own way of life. And no one has ever put it more neatly than did Jeanie Deans.

Now, of course, I should make haste to acknowledge—indeed to admit—to any audience like this, which is bound to have some Scottish connections, that Edinburgh is only the youngest of the four Universities in Scotland, even though we are, in fact, quite respectably antique and getting on for four hundred years old. Yet, somehow, this question of our relative youth I am never allowed to forget—at any rate by my three brother Principals from St. Andrews, Glasgow, and Aberdeen. The result is that I have become rather sensitive on the subject of academic age.

*The following article was delivered as an address at a special Convocation of Dalhousie University when honorary degrees were conferred on the Vice-Chancellors of the Universities of Cambridge, Edinburgh, and New Zealand, September 10, 1958.

You will understand, then, how my confidence has been completely restored this morning when I have become a graduate of a University which is one of the oldest institutions of its kind in Canada.

But this marked respect for age and maturity on the part of the Scottish and other Universities is not merely the sign of a civilization that can only look back upon its past. I suggest to you that it is rather a significant expression of the essential nature of a University. Continuity in human knowledge, the linking of the past with the present and the future—the handing on of knowledge and experience from one generation to another—is surely one of the essential tasks of any civilization worthy of the name. That is why every University, in Britain no less than in Canada, is faced with the necessity for achieving a continuous reconciliation between the past and the future, an adjustment of the discoveries and the modes of thinking of past ages to those of the present. This problem of adjustment, of reconciliation, is in the case of the Universities (and, incidentally, of the public which supports them and from whom they draw their material) of particularly vital importance today, when man's material knowledge, and the power inherent in that knowledge, is advancing so dynamically. And a failure on our part to achieve some appropriate reconciliation between the forces of conservatism and the forces of progress—between the old which we must hang on to and the new which we must grasp—may mean, if not disaster, at the best stagnation.

As one illustration of this need for adjustment, I may mention that all the Scottish Universities, like others the world over, are busy extending their provision for education in the physical sciences, in accordance with the needs of our times. Physical science—that is to say, Natural Philosophy—is, of course, no new discipline for them; for I may remark, though I am too civil to labour the point in the presence of the Master of Trinity, that the Newtonian Philosophy was taught in Edinburgh thirty-five years before it was adopted as official doctrine in Cambridge—the University of its inventor. But we live in an age when the new technology, based in this case mainly on scientific discovery and application, is growing with lusty acceleration. By contrast we may note that the older technology, the technology of the Industrial Revolution, was based not so much on science as on crafts and inventions.

However, it cannot be said that science and technology, which are relatively late-comers in the academic hierarchy, have yet been accorded exactly the same social acceptance as the older disciplines such as the humanities. I have more than once remarked that all this strikes me as extremely odd, since Universities have had Medical Faculties for centuries and Medicine is certainly a technology. That it is a science and an

art as well does not alter the fact. I think we would all desire our doctors to be vocationally trained in the practical technique—the technology—of administering penicillin as well as soundly versed in the theory of its antibiotic effect, if we are going to trust ourselves to their therapeutic care.

The fact is, however, that both science and scientists are viewed in some quarters with suspicion. I should be sorry to think that this hostility to science arises from the fact that it is both progressive and successful, whereas in other disciplines advances are not so obvious. Some people speak of a rift, and even an antagonism, between science and the humanities, which seems odd to me because they deal with complementary aspects of human experience. However, I must point out that any adverse attitude towards science that we may encounter today is really not new. Listen to a voice from the past—a quotation from "An Essay on the Study of Literature," written nearly two hundred years ago. Here it is: "Natural Philosophy and the mathematics are now in possession of the throne; their sister sciences fall prostrate before them, are ignominiously chained to their car or otherwise servilely employed to adorn their triumph." And then the author adds—it seems to me rather hopefully—"Perhaps their reign, too, is short and their fall approaches." The author? Edward Gibbon, the historian, writing in 1791.

An historian of today, Arnold Toynbee, basing his conclusions largely from what has happened since the nuclear bomb was used in warfare in 1945, concludes that, "Among the public in a Westernizing World in the later decades of the twentieth century there might be a revulsion of feeling against science and technology like the revulsion against religion in the later decades of the seventeenth century."

Perhaps a lesser charge against science is that by way of its explanations, it disperses the mystery of things and causes wonder to languish. When science enters the door, enchantment, it is said, flies out of the window. Perhaps we might think that Walter de la Mare is making such a complaint when he writes:

I saw sweet Poetry turn troubled eyes
 On shaggy science nosing on the grass,
 For by that way poor Poetry must pass
 On her long pilgrimage to paradise.
 He snuffled, grunted, squealed; perplexed by flies,
 Parched, weatherworn, and near of sight, alas,
 From peering close where very little was
 In dens secluded from the open skies.

But, please note, de la Mare goes on:

But Poetry in bravery went down
And called his name, soft, clear and fearlessly;
Stooped low and stroked his muzzle overgrown;
Refreshed his drought with dew; wiped pure and free
His eyes: and lo! laughed loud for joy to see
In those grey deeps the azure of her own.

Surely that conclusion is right. Science has a beauty of its own, and the scientist, like the poet, must command a greater awareness, a longer vision, and a deeper perception than his fellows.

But I return to the more serious charge that the modern scientist is a dangerous innovator, if not a downright barbarian. To my mind it is a charge that is based on a grave misconception of what science is, and of what the scientist professes to be. Above all we must recognize the limitations of science—limitations that the scientist is the first to acknowledge. Science does not pretend to supply us with what many men believe they have themselves derived from tradition and revelation. We cannot, by science—or, may I add, by logic either—prove or disprove the existence of God. Science is only concerned with what can be observed by the senses and thus measured. It has nothing to say in the domain of morals, ethics or religion—the domain of what I would count even larger issues. And it behoves us to move with infinite caution when we seek to identify the connections between the disclosures of science and these larger issues—issues which confront us in the everyday world of thought and action, the world which asks, and has to decide, what is good or evil, what is right or wrong. Admittedly the progress of science increases the arena involving decisions which confront us all, scientists included. But science in this context is neutral, though the scientist, like everyone else, should not himself be so.

It therefore seems to me that the progress of science, and the insistent call for more and more scientists, demands that we should look afresh at the education of our young people—a responsibility I count to be the most important of the undertakings of any nation. In that connection a distinguished humanist, Sir Richard Livingstone, has declared that "Living and dealing with atoms is no preparation for living and dealing with men." Agreed; but the humanists must help us, so far as they are able, to ensure that our young scientists become able to deal with both atoms and men. And this means, above all, that they must recognize in what they teach, as we do, that atoms and countless other scientific entities are going to shape the lives and thoughts of men and the destiny of nations. While he is at school the education of our future scientist should link his humane and scientific studies by way of history, taught with the object of profiting by other men's social and political experience. I would be ready to

jettison the attainment of minute linguistic scholarship if history were taught in that way; for the young scientist gets his mental discipline, which linguistic studies are acknowledged to confer, in another way. Only when he is more mature would I feel inclined to utilize the suggestion, frequently made, that the link between humane and scientific studies should be effected by way of the social sciences. We can admit the claim that the social scientist is dealing with real live people, whereas the older humanities deal with dead ones. But the methods and theories of the social scientist have not yet acquired the precision of the physical scientist, largely, I think, because he is dealing with problems that involve, to a far greater extent, the interaction of the observer and the observed. That is why I feel that such matters should only be introduced to the student when his experience of life is more extensive, and his critical faculty more fully developed.

My plea, then, is that we are concerned with the education of the heart as well as the education of the mind. Any conflict between the humanities and the sciences is entirely illusory if we recognize the content of education as being learning about man as a whole. The old humanistic ideal of education needs no revision. The study of man, whether of his mind and feelings through the arts or of his physical nature and cosmic circumstances through the sciences, is still, and must forever remain, the central subject of education. It is for the Universities, I suggest, to take a firm stand on this issue—to declare our full recognition of the wholeness of men. We must here express our conviction in what we teach and learn. Increasing specialization there must be. But let us at all costs prevent specialization from degenerating into unreal and opposed dichotomies—of which a cleavage between science and the humanities would be the most unfortunate example of all.

But I must not run on. So I come back to an assurance of the loyalty you may count on from the three new members of your academic foundation. Perhaps it is not inappropriate, here in Dalhousie, for me to describe our sentiments by quoting from Edinburgh University ritual—from the *Sponsio Academica*, signed by freshmen when they enter the University. Now I shall not quote from the second oldest version of that *Sponsio*—that of 1639—according to which we would promise, for example, to be courteous to University officials, promise not to damage or weaken the fabric of the University or break its windows, promise not to cut, write, or scratch anything on the walls or benches of the University—for I think you may assume us ready with all these undertakings. No, I take a phrase from a much later version which expresses, quite simply, exactly what we feel when we say just this: “We promise fidelity and all good service to the University.”