Irish Journal of Education, 1972, vi, 1, pp 3-8

INTERDISCIPLINARITY IN THE UNIVERSITIES

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Technological developments following the industrial revolution have produced vast changes in living conditions A broadly based education is necessary if individuals are going to be able to cope adequately with changing technological and cultural conditions Historically, third level education in many countries has ignored the need for inter-disciplinary education Humanistic studies, however, are incomplete and fossilized unless they embrace the dynamic of science and technology, on the other hand, technology untouched by the vision, insight and sensitivity of the humanities leads to a nightmare Despite obvious difficulties, education must attempt to become more inter disciplinary in the future

Some years ago when directing two survey teams, sponsored jointly by the Organization for Economic Co-operation and Development and the Irish Government, which eventually reported their findings in *Investment in education* (4) and *Science and Irish economic development* (7), I became convinced that pluridisciplinarity and interdisciplinarity would be two of the most significant and controversial aspects of education for the last quarter of this century I became aware of the problems of linking apparently disparate disciplines, and I knew that some who used inter-disciplinarity as a vogue word had little or no experience of the difficulties in practising what lay behind the theory At the time, I noted that all too often education is considered in the narrow and restricted sense of acquiring technical skills In its broadest liberal sense however, education cannot be pre-occupied with purely technical skills The distinction between utilitarian and cultural education is essentially invalid To paraphrase Maritain, the trouble with purely utilitarian education is that it is not utilitarian enough

The next ten years will see great economic changes in Ireland Industries and occupations which loom large today may cease to exist in the 1970s Thus the provision of limited technical skills which may soon stale and become obsolete is a waste of resources Education must be directed towards providing the greatest possible measure of flexibility and adapt-ability It should provide for the recipient's lifetime, rather than for specific skills This means teaching people to think resourcefully rather than to remember mechanically, to understand, not so much any particular changing technology as the application of principles to changing conditions, to appreciate the scientific method as a mode of thought and as a discipline

To a greater or lesser degree this approach should be observed at all levels of education, from primary to third level

Bertrand Russell, at one time, noted that the European universities very often refuse to accept technical or technological education, including education in the service professions, as genuine higher education They cling to the idea that the purpose of a university is to provide a liberal education in line with long-established standards and to resist the demands of mass education It would be a pity, however, if education for an industrial society had to be provided outside the universities, which are pre-eminently suited to the integration of all knowledge and learning It would be a serious matter for civilization if industry were alienated from the universities and the humanities We have not yet recovered from the failure of Europe to devise a culture for an industrial society in the nineteenth century

The coming of a united Europe will force a little more rationality into attitudes, the computer and mechanization will reduce the prospects in many clerical occupations and will force students and parents to choose a type of school with more regard for the prospects of future employments These are facts upon which we would ponder The inventions of the great English industrial revolution in the eighteenth century of Watt, Arkwright, Hargreaves and others produced technical changes in the first instance, but also social consequences for the mass of the English population The inventions changed society and its attitudes In the nineteenth century, the connection between industry and education was not fully appreciated by very many in England The result was a creation of a proletariat with little attention to its cultural needs

If Homer, Shakespeare, Proust, Beethoven and Joyce had never lived, the lives of the masses of the world would be largely unchanged But if inventors and technologists such as Watt, Hargreaves and Whittle had not lived, the daily lives of millions of people all round the world would be profoundly different from what they are today These changes are only beginning Modern technology is expediting them

Technological change represents the influence of the West on mankind The industrial revolution, still going on, began humbly in Yorkshire and Lancashire But its explosive force has spread throughout the world How can man live as a civilized personality with these discoveries? Technological change advances, said Bertrand Russell, 'like an army of tanks that has lost its drivers, blindly, ruthlessly, without goal or purpose' This is because many men of scholarship and imagination are still living largely in a pre-industrial world of classical literature, English poetry or French novels, as if these artistic creations should be frozen and fossilized in the past They

have failed to create a culture appropriate to an industrial age, failed to show the dynamic of classicism Humanism should adapt itself to technological advances, otherwise technology becomes arid and barren

There are, of course, exceptions the Swedish film director, Bergman, the painter Picasso, the novelist, Graham Greene, the dramatist, Beckett are creating an art which is the most compelling expression of the environment in which contemporary man lives These artists, alas, are only a few against those whose vision of truth and beauty is irrelevant to the present-day world Too many contemporary artists in their romantic escapism, in their rejection of industrial, scientific society, reveal a failure to create artistically a vision or an interpretation of actual society in the world in which they live Their art is archaic *

Revolutions in technique have produced revolutions in daily life A new society and a new culture came into existence when agriculture ceased to be nomadic and became settled Agriculture, as Lord Russell said, has evolved through serfdom to more humanized conditions Can industrialism be humanized more quickly?

Industrialism has made man and groups more interdependent How can one preserve and enlarge the scope for individual initiative in this industrialized world? Liberty must be preserved if people are not to cease being persons and individuals Consciousness of the need for liberty implies appropriate educational foundations Surely the problems of an industrial society are not too difficult if its educational system is designed to deal with them

The adaptable role of educational systems has been admirably illustrated in a series of lectures by President Perkins of Cornell University (5) He spoke of the three main missions of the university and the danger of giving undue emphasis to any one to the exclusion of the others In nineteenth century England, Oxford and Cambridge, dominated by undergraduate colleges, were concerned mainly with teaching—the transmission of knowledge Research was carried out mainly by heroic individuals, usually working alone in their own homes—James Mill, David Ricardo or Karl Marx in the British Museum Nineteenth century German universities, says Perkins, concentrated on pure research and became elitist institutions pre-occupied with the acquistion of knowledge—pure research Two great

*The Irish poet, Patrick Kavanagh, made this point more effectively and, certainly, more pungently when he wrote

> Culture is always something that was,
> Something that pedants can measure,
> Thigh of chief, skull of bard,
> Depth of dried-up river
> Will it be thus forever?

American examplars of eighteenth century enlightenment, Thomas Jefferson and Benjamin Franklin, had a vision of a third mission for the university—that of applying acquired knowledge from higher education to the service of the community and society This vision of Jefferson and Franklin eventually found expression in the Land Grant Colleges set up by state legislatures in the U S A a century ago Soon other universities in the United States and elsewhere were following their example in providing these three missions in a university This was a remarkable achievement Like Jean Jacques Rousseau, it has, in its own way, altered the formal eighteenth century relations between the 'what' and the 'how'

Astoundingly rapid developments in research and technology led not merely to institutionalized slices of specialized knowledge inside the traditional university but to other forms of third-level education divorced from the university and to the proliferation of research institutes very often unconnected with the universities This segregation of disciplines and the divorce between teaching and research became increasingly dangerous according as the need was recognized of binding the humanities and the sciences closer together if the needs of society were to be met and if civilization was to consist of people who can communicate intelligibly with one another

Professor Pippard (6) has suggested that after graduation with a bachelor's degree of a two-year general course, students should have a number of options They could specialize for two-year courses in engineering or other applied sciences or they could enter schools of medicine law, education or business A diploma might be awarded after a third year and a master's degree after the fourth year No research would begin until after the master's degree was awarded

Professor W H Armytage has pointed out that 'one of the great merits of this scheme is that it envisages students, at the end of their two year degree course, proceeding not only to universities, but to the polytechnics as well (2) He quotes Professor Pippard as adding ' if educational programmes were combined with major research projects closely associated with industry, these institutions would fulfil a natural role as centres of excellence in the useful arts ' Armytage also recalls that mobility between universities and government research establishments was recommended by the Robbins Committee in 1963 and by the Mott Committee in 1966 All this is, of course, in line with the view of the Swann Committee that 'the main requirement in the future will be for science based generalists in occupations such as school teaching, general management and administration (3, p 14)' What appears to be required is a general broadly based first degree to which specialisms can be added (I do not think it

matters greatly whether this first degree course should have a duration of two or three years) This would enable future specialists and technologists to acquire some understanding of the society in which they work and of some, at least, of the main features of its culture This would go some way towards avoiding the Hieronymus Bosch *dicblerie* of horrors which Bertand Russell contemplated in dismay in a technologically orientated world untouched by the vision, insight and sensitivities of the humanities

It is obvious that, structurally, the inter-relationships between all third-level education institutions must be reconsidered In the United Kingdom and in Ireland this debalkanization of education is already under way In Ireland, the government has initiated action for closer association between the universities, and there is a growing body of opinion in favour of the incorporation in the university system of government-sponsored research institutes

The Irish Higher Education Authority has recommended the creation of a Council for National Awards The sandwich course system adopted in some British universities is producing admirable results However, some Irish academics are waiting with interest for answers to the questions asked in *Nciure* some time ago concerning the possibility of 'working out means by which polytechnics and universities could share facilities and teachers and even, on some occasions, the same boards of governors and Privy Council charters' (1)

A basic general studies course seems to be a good way to ensure that the university freshman has access to a sufficient range of disciplines so that at the end of the first year he is in a position to decide whether his metier rests in the university or elsewhere in third-level education I would hope that very many of third-level institutions outside the university would establish closer associations with universities and that in general a broader and more flexible view would be taken of third and fourth level education

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