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G.A.T.S. and Universities: implications for research.

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Abstract

The likely impact of applying the General Agreement on Trade in Services (GATS) to higher education are examined. GATS aims to "open up" services to competition: no preference can be shown to national or government providers.

The consequences for teaching are likely to be that private companies, with degree-awarding powers, would be eligible for the same subsidies as public providers. Appealing to the inadequate recently-introduced "benchmark" statements as proof of quality, they would provide a "bare bones" service at lower cost. Public subsidies would go: education being reduced that minimum which could be packaged in terms of verifiable "learning outcomes". The loss of "higher" aspirations, such education of critically-minded citizens of a democratic and civilised society would impoverish the university's research culture which demands honesty and openness to public scrutiny.

Most university research is substantially supported by public subsidy. Under GATS discipline, commercial providers of research services could be entitled to similar public subsidies. Publicly funded fundamental research would fade, leaving university research totally dependent for funds upon the good will of industry and commerce. Present problems, such as the suppression of unwelcome results and the use of questionable results to manipulate public opinion, would considerably increase. The public would lose a prime source of trustworthy knowledge, needed in political discourse, legal disputation, consumer protection and in many other contexts.

Introduction

When the members of the Conference of Rectors of European Universities met in Bologna in 1988 to celebrate the nine hundredth anniversary of the foundation of that institution, they endorsed a *Magna Charta of European Universities* in which they emphasised their view of the central part that universities play in the cultural, scientific, and technical development of humankind. To play this part they insisted that university research and teaching should be morally and intellectually independent of all political authority and economic power. Freedom in research and education (they argued) was a fundamental principle of university life, which governments must respect [1]. It is the argument of this paper that the application of the World Trade Organisation's General Agreement on Trade in Services to higher education would undermine this principle in a way which could cause serious damage to a liberal democracy.

The Rectors' perception of university teaching and research, as separate from, and independent of, government, and of industry and commerce, was not controversial: it was the traditional view, certainly in Western democracies. Lyotard sees it as originating in Humboldt's constitution of the University of Berlin at the beginning of the nineteenth century [2]. This perception, implicit in the approach to university education adopted by

UK governments over many decades, is supported by a host of reports and documents, such as the Robbins Report[3], UNESCO declarations [4], and it occupies a prominent place in the 1997 Dearing Report [5]

Of course, the separation of academe from industry and commerce was never absolute. The greatly increased scope of higher education in recent years, involving vast sums of public money, has put universities under scrutiny over what they teach and what they research, and what they do with their research results. Inevitably there have been many pressures bringing universities and industry into close collaboration. The arguments in favour of this have not generally attacked the "moral and intellectual independence" of universities, but have emphasised the benefits to both sides from working together. Those expressing concern at closer collaboration, have rarely opposed collaboration in principle, but have been concerned that the circumstances of collaboration were not adequate to protect the university independence, which the Bologna declaration saw as being essential for the benefit of society [6].

A much more subtle critique of the traditional idea of a university has come from a postmodern perspective. The increasing recognition of the impossibility of obtaining neutral knowledge derived from value-free methodology, engenders a mistrust of metanarratives (Lyotard) [7] , characteristic of postmodernism. This has a profound effect on academic disciplines, acting both at the conscious and unconscious level, undermining our confidence by casting doubt on what seemed, until recently, to be eternal verities [8, 9].

Among the "verities" on which doubt is cast is the traditional liberal ideal of a university. This might be seen as undermining any claim of a fundamental dichotomy between university and industry, and as bringing their outlook and values into line. On the other hand, the mistrust of metanarrative applies equally to the ideology of free-market capitalism, which underpins most of industry and commerce in the West, and increasingly throughout the world. Fundamental to education in a postmodern world is recognition (in Barnett's words) that "knowledge is not given: it is socially sustained and invested with interests and backed by power". He goes on to argue that "We cannot leave our students sensing that there is a givenness to the knowledge structures that they are encountering or that those structures are socially neutral." [10] A postmodern critique calls into question, not only the fundamental assumptions of free market capitalism, but a plethora of associated issues, generally-unexamined, ranging from of the ethical nature of a company's policies to the level of the directors' remuneration. It might be argued that such a critique was more subversive of industrial interests than traditional liberal ideal, with its insistence on the "moral and intellectual independence" of universities.

At present in the United Kingdom (as in many other countries in the world) we have a higher education system which is largely publicly-funded, but which nevertheless gets a significant amount of income from private sources. This is not a system at equilibrium. The present Labour government, like its Conservative predecessor, has no objections in principle to free-market capitalism, at home and abroad. It has said that it is determined to bring more private finance into public services, and it supports the World Trade Organisation (WTO) principles of continuing reductions in barriers to trade [11].

At present the WTO has gone a long way along the path of reducing tariffs which it sees as a barrier to trade in goods. It is now turning its attention to trade in services, under the banner of the General Agreement on Trade in Services (GATS). Over 160 service "industries" are included within its scope: these include health and education [12, 13]. In this paper I want to examine the implications that the application of GATS protocols might have for higher education in this country, examining in particular their likely impact on the integrity of research. Because research in universities is so closely bound up with

teaching, it will be necessary also to discuss the implications of GATS for university teaching.

What is GATS?

Following the disruption to trade caused by the second world war, there were moves to establish an organisation to regulate trade under the auspices of the United Nations. However twenty-three of the world's richest nations considered it preferable to set up the General Agreement on Tariffs and Trade (GATT), outside the control of the U.N. It was established in 1947 with the aim of encourage international trade by lowering barriers, such as import duties on manufactured goods [14, 15]. Over the years the scope of GATT increased, and its membership rose to over 140. In 1994 at trade negotiations held in Uruguay GATT was reconstituted as the World Trade Organisation (WTO) with the mission of further "liberalisation" of world trade. The WTO, like GATT before it, is driven by a free market philosophy: free-up markets, stimulate trade and all will benefit. Among the agreements adopted in the "Uruguay Round" was the General Agreement on Trade in Services GATS, the subject of this paper.

GATS is a response to the recognition that over 20% [16] of the economic activity in the globe concerns trade in services, as opposed to trade in goods (the concern of other WTO agreements). The basic idea behind GATS is to extend the free market principles to "open up" services to competition, thereby (the argument runs) making them more efficient by lowering costs to the benefit of all. The scope of GATS is wide, extending to any service in any sector, for example, banking, insurance, broadcasting, water, energy, post and telecommunications. [17] Education is regarded as a service industry and is explicitly mentioned in GATS literature. There can be no doubt that, in principle, it comes within the scope of GATS [18].

The basic principle of GATS is that the market for services which come within its scope should be open to all WTO members without discrimination. Thus member countries must extend to all other members, the most favourable conditions that apply to any. ("Most Favoured Nation" status.) Foreign service suppliers must be treated in the same way as national suppliers are treated (the "National Treatment" rule) [12, 19].

At present GATS is a "bottom-up" agreement, meaning that it allows individual governments to nominate which of their services should be covered by its provisions. Within the European Community, European Commission acts on behalf of member states on the basis of a position established by qualified majority voting to be introduced under the terms of the Nice Treaty [20].

The position of education with respect to GATS

The position of the provision of education in relation to GATS is an interesting and crucial one. In the United Kingdom there is strong opposition to "privatisation" of public education services, and the government argues that "public health and education services are explicitly excluded from GATS" [20, 21]. The basis of this argument is the GATS exclusion of "services supplied in the exercise of government authority". Such services are defined as those "which [are] supplied neither on a commercial basis, nor in competition with one or more service suppliers" [22].

Other commentators regard this argument as disingenuous, pointing out that "most public services, including post-secondary education, involve both public and private funding and are delivered by a mix of public, non-profit and for-profit providers, [and] do not appear to benefit from this exclusion [under GATS Article 1:3(c)]". This quotation is taken from a summary written for the Canadian Association of University Teachers, but it applies equally to the United Kingdom, and indeed to many "advanced" capitalist nations.

[12, 23, 24]. There are already foreign "for profit" higher education institutions operating in the United Kingdom [25], and distance learning provision, using the web and other media are expected to develop rapidly.

When the present form of GATS was established in 1994, it was regarded as being much less far reaching than the WTO would have liked [26]. As is usual with WTO agreements, there was the expectation that further liberalisation would follow, in this case of trade in services. In February 2000 negotiations to revise the GATS provisions started, with the aim of being completed by December 2002 [11, 15]. It has been suggested that many of the industrialised countries want to convert GATS to a "top down" agreement in which all services would be covered unless expressly excluded by a particular country. Pollock and Price have warned that "new regulatory proposals could force governments to open up their public services to foreign investors and markets" [27]. The authors were writing in the *Lancet*, and were concerned about the future of health care, but exactly the same situation could apply to education, especially to higher education. Both the U.S. Coalition of Service Industries and the European Services Forum have been lobbying for post-secondary education (and also health care) to be among the priority areas for trade liberalisation [15].

The United States delegation to the WTO Council for Trade in Services has submitted a proposal[24] that higher education including "degree courses taken for college or university credits" (para. 5) should be subject to "existing GATS market access ... as well as additional GATS disciplines" (para. 7). Note that research degrees are by implication included in this proposal. The US delegation would like WTO members to "inscribe in their schedules '*no limitations*' on market access and national treatment" and comments that some members already have done this (para. 9). The sort of business opportunities that the US sees can be judged from a list of present obstacles to the liberalisation of higher education which the US delegation would like to see removed. These include regulations which prevent or inhibit foreign providers from establishing facilities or from awarding degrees. It would not be surprising if "foreign service providers" were interested in making a profit out of higher education, so US delegation is concerned that subsidies for higher education should be made known in a clear and transparent manner, presumably so that they can be claimed under the "National Treatment" rule, discussed above. Consequently the delegation wishes obstacles to the repatriation of profits to be removed. [24] At least one American "for-profit" university is already looking forward to gaining access to the British "market" under GATS provisions [25].

Thus it seems that there is a realistic possibility that the provision of higher education in the U.K. and elsewhere could become subject to GATS discipline. At present the UK government spends over £7000M p.a. on higher education[28]. This enormous "market" could be opened up to private providers, whether based in the U.K. or abroad. What might be the implications of this for research and scholarship? Before this can be examined in detail, it is necessary to recognise that teaching and research in a university are not, in general, separate activities: they are closely linked, and to some extent integrated. Changes which fundamentally affect teaching will have repercussions in research. Teaching takes place within a culture which nurtures research, and is, in many different ways, informed by that research. The independence of university research grows from an academic culture of critical, independent teaching. It will therefore be necessary in this paper to make some comment on the implications of GATS discipline for teaching, before moving on to discuss its impact on research per se.

GATS and university teaching.

How might the opening of the higher education market affect teaching? The attraction to private providers would be that the subsidies made available to the public provision would have to be available to them. This would not only involve grants and loans at low interest to students, but the public subsidy for buildings, facilities and overheads which universities receive through the funding councils. The challenge to private providers would be, by way of "efficiencies", to provide the service at lower cost enabling a profit to be taken.

While it is possible that there would be private providers wishing to offer a wide range of courses typical of a conventional university, it seems likely that most private companies would concentrate on niche areas where they could "cherry pick" courses in subjects with high demand. In order to be in a position to invoke the GATS National Treatment rule, and to demand the subsidies given to public universities, the private providers would have to demonstrate that their courses were essentially equivalent to those provided in public institutions. It might seem that this would be a difficult, almost impossible task. It would require a detailed examination of courses at established universities. This would surely have to involve, not just comparison of the depth and breadth of the material formally taught, but the identification of the wide range of explicit and implicit influences which went into the intellectual, moral and social formation of the graduate.

On the other hand, since the nineties U.K. governments have treated "quality" in higher education in narrow instrumental terms. This has been reflected in approach adopted up to the present by the Quality Assurance Agency (QAA), a body *de facto* under government control. It has laid heavy emphasis on measurable outcomes which can be "objectively" assessed. Now, just in time it might seem for the move towards GATS, it is completing the production of "benchmark" statements for all major subject areas. These consist of a few sheets of A4, and are designed to tell employers and other interested parties the "level of outcome" of a graduate in a particular subject. The Dearing committee saw them as providing an "effective mechanism" of maintaining "the general standard of [academic] awards" [29].

If a U.K. government wanted to open up higher education to private competition, and, in the spirit of GATS, wanted to avoid burdensome regulation, it would have to hand these benchmarks as providing criteria to which private providers could appeal, as evidence for the standards of their degree courses.

Despite the aspirations of Dearing, benchmarks in fact provide very inadequate descriptions of degree courses. How could it be otherwise, given their length? They are inadequate at the simple instrumental level and because of the poverty of the concept of higher education which they imply.

The instrumental inadequacy can be demonstrated by examining some of the statements they comprise. For example the *Chemistry* benchmark statement requires a knowledge of atomic structure. As a criterion, this could be satisfied by a twenty minute revision of the relevant part of A level or by a 24 hour final year course, based around *Atkins' Molecular Quantum Mechanics*. Most academic chemists would regard the former as utterly inadequate, even if they did not subject their students to the full rigour of the latter. This inadequacy permeates the benchmark statements. Where they talk of general skills, they are no more satisfactory. *Materials Science* graduates should "have problem solving skills" and "be able to exercise original thought". Many primary school teachers recognise such attributes in their pupils. The *History* insistence on an "awareness of continuity and change over extended time spans" fares no better.

These benchmark statements are only intelligible within a living tradition, not when divorced from that tradition. By careful examination of what is actually done in reputable

courses, it may be possible to say what sort of problems a Materials Science graduate might be expected to solve or the depth of subtlety implied by the historian's awareness of continuity and change. Hardly surprisingly, it is not possible to incorporate that tradition within a short form of words. Essentially the same difficulties apply to any concise form of words, such as the QAA's qualifications framework or degree programme specifications.

Taking a broader view of what constitutes the quality of education, the problem with benchmark statements is more profound. Even in vocational subjects, a degree is a means to an end, not an end in itself. Consider what are commonly regarded as the purposes of university education.

A university education aspires to much more than a training in skills and to do much more than impart factual knowledge. Phrases such as "cultivation of the intellect"[30], "development of critical faculties" [9] have been used to describe it. As the Robbins Report expressed it, "[t]he aim should be to produce not mere specialists but rather cultivated men and women"[31]. The social interaction with other students of different disciplines and different outlooks is seen as making an indispensable contribution to an university education. Newman argued that "though [students] cannot pursue every subject ... they will be the gainers by living among those who represent the whole circle [of knowledge]"[32]. The recent Dearing Report demonstrated that these concepts still attract vigorous support. It spoke of higher education's engendering "a commitment to the pursuit of truth" and a commitment to "freedom of thought and expression" [5]. It also insisted

"The time in higher education provides students with an opportunity to consider for themselves the values needed in a democratic society; a willingness to debate issues rationally and openly, and a commitment to a pluralistic society, the rule of law and the protection of personal liberties. It also provides a chance to reflect on the vulnerability of such a society and the need for continued support for the values that underpin it." [5]

Although from a postmodern perspective, such an expression of the aims of education might be regarded as naive, that perspective is even more hostile to a narrow "skills and factual knowledge" concept of education. For example, Barnett argues that education must break out of the rigid subject disciplinary framework of many traditional degree schemes. It is especially important that students be encouraged to develop a reflective critique of the methods of their core discipline. They should be led to an understanding of its philosophical and sociological context, and its relationship to other ways of knowing [9]. Giroux is equally hostile to disciplinary boundaries and insists that we adopt a sceptical attitude to "any notion of reason which purports to reveal the truth by denying its own historical construction and ideological principles" [33].

The underlying philosophy of GATS is that services should be provided by the private sector wherever possible: its whole purpose is to create and expand private markets. Its regulations insist that licensing requirements for private providers are not "more burdensome than necessary to ensure the quality of the service" [34], and no restriction can be placed on the type of legal entity of a private provider [26]. It would be difficult to ensure respect for academic freedom and impossible to require private providers to be morally and intellectually independent of economic power. What could stop a commercial corporation from using the provision of higher education as a means of projecting a favourable image, or even as part of its marketing strategy?

The WTO has identified the existence of government monopolies as a barrier to the expansion of private markets. Under the full impact of GATS discipline it is difficult to see the culture of public service higher education persisting for long. Public grants would have to be available to foreign students from WTO countries and subsidies for teaching to private providers: both would surely cease. Education would be reduced that minimum

which could be packaged in terms of explicit and verifiable "learning outcomes" delivered at maximum cost-effectiveness judged by purely monetary criteria. In most areas a narrow vocationalism would be the best which would prevail. Where, in a market-driven education system, would be the opportunity to break out of the rigid subject disciplinary framework, or to challenge students to consider whether knowledge is given, or whether it is "socially sustained and invested with interests and backed by power"? Lost would be all "higher" aspirations such as "to produce cultivated men and women" [31] and to produce critically-minded citizens of a democratic and civilised society [5]. What might be the implications of such changes for research in universities?

Research in universities

The values of research

A major occupation of a modern university is research. Science is often seen as providing the classical paradigm of research, so let us briefly examine the values of science, as traditionally conceived. These have often been discussed in terms of Merton's norms of universalism, communalism, disinterestedness and organised scepticism [35, 36]. Such values as

- honest experimentation;
- meticulous respect for evidence;
- candid admission of mistake or error;
- disinterested pursuit of "truth";
- moral and intellectual independence of all political authority and economic power.

would be widely acknowledged by scientists as representing the aspirations of science. Vital to this conception of science is openness to public scrutiny of one's peers. Indeed there is a serious sense in which experimental results and their interpretation do not become "science" until they have survived this public exposure [6].

Merton's norms and these values discussed could, of course, with little modification be applied to research in any academic discipline. Honesty, pursuit of "truth", openness to public scrutiny are fundamental to research and scholarship in a university. It is not without significance that these values and norms are consonant with the independence of university teaching discussed above. The teaching and research activities of a university are mutually supportive.

Organisation of research

Research in contemporary universities may be organised in many different ways. For our purposes, it is convenient to classify these according to the extent to which they need extra-mural resources. (i) Some research simply involves academics using facilities of the university, such as libraries, computers and the resources of the well-found laboratory. This is more common in the humanities, but is certainly not unknown in science. (ii) Much research is supported financially by government-funded research councils. This is a means of providing for fundamental research. There is an expectation that the outcome of research council funded projects will be published. At one time these funds were disbursed as a result of unsolicited research proposals submitted by academics keen to develop their own ideas. Increasingly, the research councils respond to perceived national need, for example suggested by "Foresight" panels [6, 37, 38], by calling for research proposals in particular areas. This is called "managed mode". (iii) In recent years, research councils have introduced a wide range of schemes which provide funds for university researchers to work on joint projects with industry or commerce. (iv) Some research in universities is "fully-funded" by external bodies such as government departments, industry or commerce.

Over the past fifty years, there has been a massive shift from (i) towards (iv). This is partly a result of the increased complexity of equipment needed in many branches of science and engineering, and of the perceived need to employ teams of research assistants in the social sciences and the humanities. The shift has accelerated since the Thatcherite social revolution of the 1980's, with increasing emphasis on the commercialisation of knowledge.

It is relevant to note that this shift has been accompanied by increasing problems associated with the incommensurability of the values of industry and commerce with those of science and universities [6, 39]. Put more bluntly, the wish of industry for research to boost its products in the competitive market place to make increased profits, has often proved incompatible with the disinterested pursuit of "truth" and full and open publication.

Public funding of university research

It is important to recognise that all four ways of conducting research, described above, are publicly funded to a considerable extent. Obviously the first two described, (i) and (ii), rely almost entirely on public funds. In most cases of research council collaborative projects (iii), the contribution of industry is tiny compared with the input from the research council and the university involved. These schemes can be regarded as a massive public subsidy for industrial and commercial research.

It might be thought that the fourth category, "fully-funded" research, would provide an exception. The problem here is that the income from such research rarely covers the university's overhead costs. Naturally sponsors are reluctant to pay more and universities, usually desperate to maintain their research profile, have not, in general, had to bargaining power to extract the appropriate level of overheads. In recent years the average overhead on such commercial research contracts has been only about 20%. [28] A realistic figure will vary from institution to institution, but it must surely be in excess of 100% [40]. Thus industry and commerce benefit from enormous public subsidy when they make use of university research facilities. Put another way, universities are able to act as providers of cheap research services because of the public subsidy. Without this, they would face much stiffer competition from commercial research organisations.

The implications of the GATS

There are many private sector research organisations, especially in science and engineering, where the expertise and scope overlap those to be found in particular university departments. Examples include research departments of individual companies, and joint research establishments, maintained by particular industries - for example the Rubber and Plastics Research Association (RAPRA). There are also contract research organisations which provide a service within a particular area of expertise. Such commercial organisations can be seen as being, in principle, in competition with universities for funds.

Let us examine the likely implications for university research of opening up higher education to the GATS regulations. The regulations would seem to put private sector research organisations on a par with universities, if they could claim to provide a similar service, i.e. to do similar research.

At very least, GATS would mean that research council "managed mode" calls for applications would have to be open to all research organisations, home and abroad. Not only would private applicants, if successful, claim the research council grant, they would surely argue that GATS regulations also entitled them to proportionate infrastructure overhead cost. These are provided to universities from public funds. In the U.K. they come from the funding councils under the "dual support" arrangements.

Similar principles would seem to bear on "fully-funded" research in universities (class (iv) above). At present, a private research organisation, tendering for a contract with a commercial company in competition with a university department, can be at a commercial disadvantage, as the hidden public subsidy given to the university enables it to charge unrealistically low overheads. Under GATS regulations, the private organisation would surely claim a similar subsidy under "equal treatment" rules.

What about research originating from academics' own ideas and supported either out of general university facilities ((i) above) or by research council funds? Could private sector providers lay claim to analogous public funding? There could be an argument that this kind of research provided a research environment, out of which strong applications for external funding flowed. Therefore, without analogous subsidies, private providers were at an unfair disadvantage to public universities. Whether such an argument would prevail would depend on the wording of future GATS regulations.

In summary, it seems clear that GATS regulations would not allow more favourable treatment of universities, so any public subsidies available to universities for research, would have to be made available to private organisations. This principle would apply equally to both foreign and to domestic research providers. It might be objected that special public subsidies to universities were justified on the grounds that much of their research was in fact "education" - research training leading to higher degrees. Making use of regulations liberalised under GATS, private research organisations could respond by applying for degree-granting powers, and then award their own Ph.Ds. for research work.

In the earlier discussion of the likely effect of GATS on university teaching, it was argued that the culture of critical independence, which feeds the research culture, would be eroded, as these public grants and subsidies for teaching disappeared. This would progressively impoverish the culture in which research was conducted. It can now be seen that university research would also be affected more directly. As private industry demanded the same subsidies as public universities, publicly funded fundamental research would wither, even disappear. This would leave research in higher education totally dependent for funds upon the good will of industry and commerce.

This could be regarded as the logical conclusion of the trend - in the U.K., and indeed in much of the world - of bringing university research closer to the needs of industry and commerce. Over recent decades, universities have had to rely on commercial sponsors for more and more of their research funding. In parallel with this trend, has been increasing anxiety about the integrity of research. Nancy Olivieri, David Weatherall, and many others, have given details of problems such as the distortion of the research agenda, the suppression of unwelcome results, the biasing of results for financial gain and the use of questionable results to manipulate public opinion [6, 41-46]. These difficulties would considerably increase, if the application of GATS protocols to universities meant that the selection of the research agenda and control of publication became the prerogative of commercial sponsors.

It is difficult to see how fundamental research could continue, let alone thrive, under these circumstances. The serious implications of this have been underlined by David Weatherall when he drew attention to the high proportion of "useful" medical advances which originated in, apparently unrelated, pure research [46].

Equally important to society are new and radical ideas, which are capable of changing the whole way we think of ourselves, and the world we live in. These can grow in an atmosphere of intellectual freedom. For example, in recent years, a number of scientists [47-54] have moved away from concepts which played a part in the formation of Enlightenment thinking, such as rigorous determinism, reductionism and an exclusively mechanical world view. Others have shown an increasing interest in chaos theory and

holistic ideas, such as ecology and the Gaia concept [54]. Ideas like these are unlikely to find much support, where the research agenda are determined by market forces.

Instrumental science: Mode 2 knowledge

It might be objected that these dire conclusions follow from a premise which represents Merton's norms [35, 36] as canonical, and thus lays too much emphasis on the importance of science's moral and intellectual independence. These norms have been used as a basis for discussion, because they are the traditional values of science, and they are still widely recognised as such: it does not mean that they are considered immutable. Science is socially constructed, and therefore, is liable to change, as society around it changes. Indeed, there are scholars who consider that societal developments, partly associated with the social revolution of the 1980's, are bringing about a commercialisation of knowledge, including scientific knowledge itself. In somewhat different ways, this point has been argued by John Ziman [36, 55] and forcefully by Michael Gibbons et al. in their book "The New Production of Knowledge" and elsewhere [56, 57].

Ziman [36] draws a fundamental distinction between "non-instrumental" and "instrumental" science. Briefly, non-instrumental science is necessarily open and public; it sits easily with Merton's norms. Instrumental science aims at achieving specific goals, it often "serves concentrations of political and economic power" and may produce "intellectual property" whose value can only be preserved by being kept secret. Ziman accepts the importance of instrumental science, but insists that the public still requires trustworthy knowledge in political discourse, legal disputation, consumer protection and in many other contexts, and that this comes from non-instrumental science.

Whereas Ziman's contrast between instrumental and non-instrumental science is fundamentally seen as a sociological one, Gibbons et al. regard the difference between their "Mode 1" and "Mode 2" knowledge production as epistemological. Mode 1 is the traditional means in which way scientific, social and cultural knowledge is produced. It is typically produced within a discipline and is primarily cognitive in nature. In contrast, Mode 2 knowledge is produced in the context of application: it is created in broader, transdisciplinary social and economic contexts. It is deemed "knowledge" if it is useful to someone - e.g. industry, government or society at large. Its production (it is argued) is part of the business of a university. The authors see Mode 2 knowledge as supplementing, rather than supplanting, Mode 1 knowledge.

Mode 2 knowledge does not have the same problems with political authority and economic power as does Mode 1. However, Mode 2 knowledge still depends on honesty and openness. Within its scope, "good science" needs to be both "truthful" and socially responsible. The quotation marks around the word "truthful" signal a semantic, philosophical and ideological complexity to which traditional, Mode 1, science would be blind [57]. Transparency is required: if research findings are hidden from scrutiny, the progress of science may falter.

Discussion and conclusions

The General Agreement on Trade in Services (GATS) is a move to bring the principles of the global free market to bear upon the provision of services. The impact that GATS might have on higher education has been examined with particular emphasis on the effect on the integrity of research. Although the focus has been on higher education in the United Kingdom, mutatis mutandis, most of what has been said would apply to universities in liberal democracies throughout the world.

Universities play an important rôle in the cultural, scientific, and technical development of a liberal democracy. Further, they are a major source of trustworthy

knowledge, which the public needs in many areas of life, including political discourse, legal disputation and consumer protection. In order to fulfil these rôles, it is widely argued that university research and teaching should be morally and intellectually independent of political authority and economic power. This requirement for reliable knowledge is valued by those who emphasise the importance of instrumental science, or the significance of "Mode 2" knowledge production (produced in the context of application), and also by those who seek to bring universities and industry into close collaboration.

Although these ideals are not denied by those who have sought to bring universities and industry into close collaboration, it is necessary to recognise that many serious problems have arisen associated with this collaboration. Much too commonly, hard-up universities have accepted unsatisfactory contracts which have been used in ways, both incompatible with the values of science, and clearly against the public interest. Secrecy clauses, giving industrial partners a right of veto over publication are a common feature. Sometimes, even informal discussion with colleagues, across the bench, is prohibited. These clauses have been used to suppress adverse findings associated with a sponsor's products. Some industries have gone to enormous lengths to manipulate public opinion, using their control of covertly-sponsored university research.

Although higher education in the United Kingdom, as in most developed countries, is largely provided by public money, there are numerous areas where private funding is significant. These areas range from private sponsoring or research and teaching in public universities, to a range of institutions providing "for-profit" higher education services.

The basic principle of GATS is that the market for services which come within its scope should be open to all WTO members without discrimination. This would seem to make it impossible to object to a "higher education provider" on grounds of its nationality, or because of its commercial, political or ideological basis.

Under the pressure of free market competition, education would be reduced to that minimum which could be expressed in terms of verifiable "learning outcomes" delivered at lowest monetary cost. This would destroy the liberal culture of teaching and the transcendent dimension of university education. The cultural rôle of universities in society would be difficult, if not impossible, to fulfil.

Public subsidies, for example for provision of teaching or research infra-structure, and direct payments, such as research grants would be seen under GATS rules as "discrimination" in favour of state universities, so they would have to be available to private providers. Consequently, subsidies and grants would surely wither, if not disappear entirely. This would leave research in higher education totally dependent for funds upon the good will of industry and commerce. An increase in the severity of problems of corruption of scientific integrity would undoubtedly follow. Where then would the public look for reliable knowledge, morally and intellectually independent of all political authority and economic power?

This scenario follows from a consideration of the implications of the full application of GATS discipline to university education. The present GATS agreement does not force a country to open up higher education (or any other service) to its provisions. It allows individual governments considerable freedom to decide the extent to which particular services are brought within its scope. What the U.K. government might do in the future is obviously unknown. The Secretary of State for Trade and Industry has recently told Parliament that "We are the world's second largest exporter of services, so of course we want to open up markets in more service sectors; but let me make it clear that we have no intention of making any commitments that could call into question our ability to maintain public services provided through the national health service or the state education system". [58, 59]. Whether this is the same as a commitment not to apply some or all

GATS provisions to higher education is not clear. What is clear is that the present GATS agreement is currently being renegotiated, and some countries are lobbying for a more prescriptive approach, and that the U.S.A. wants higher education markets to be liberalised. It must also be remembered that such decisions will soon be taken at E.U. level, on the basis of qualified majority voting.

At present among politicians of most parties in the Western world, there is a tremendous head of steam in favour of the liberalisation of world trade. The argument of this paper is that such liberalisation of the "market" for university education could cause serious damage to a liberal democracy. It could destroy its potential for the kind of research and teaching which are morally and intellectually independent of political authority and economic power. The Dearing committee considered that a university education should encourage students to "*reflect on the vulnerability of such a [democratic] society and the need for continued support for the values that underpin it*" [5]. We should do the same.

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