Media Studies in Higher Education:

A case study of the social construction and reception of pedagogic discourse

Volume I

by

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Abstract

This thesis develops a social semiotic analysis of pedagogic communication in a media studies course which the author taught from 1993 until 1997. The author taught the course as part of an undergraduate honours degree about science, culture and communication in a university in the UK. The analysis describes the structuring of pedagogic practice on the level of the curriculum, and within the author's own "Communicating Science" module. The analysis also describes student receptions of pedagogic practice. The research reveals the extent to which pedagogic communication served to sustain the order which the degree was designed to contest: an order based on positivist conceptions of science, science communication, and therein, media theory and practice. The thesis concludes by proposing a theory of instruction which is designed to enable students to acquire the rules of realisation for more critical forms of science communication.

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I dedicate this thesis to Carmen Alfonso, whose love and work made it possible for me to write it. *Amor, vamos allí donde no espera nada y hallamos todo lo que está esperando*

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Introduction

Teaching media theory and practice

In this thesis, I will analyse the construction and reception of pedagogic discourse (cf. chapter one) in a course which I taught from 1993 to 1997: the BA (Hons) in Science, Culture and Communication (to be referred to from here onwards as SCC) which was offered by one of the so-called new universities[1].

Although I will explain the many ways in which the SCC course was not a 'mainstream' media studies course, there is one feature of the degree which made it identical to many other courses in media studies, and which will receive the most attention in this thesis: the SCC course, like many other courses in the UK, combined the teaching and learning of media studies, with the teaching and learning of media production. In the words of many educators in undergraduate degrees, it taught both 'media theory' and 'media practice'. As such, it formed a part of a more general modality of teaching media studies in higher education, which I will refer to as the **combined modality**[2].

Until recently, this modality constituted a relatively small, and indeed marginal form of higher education in the UK. However, in the 1990's, the field experienced an extraordinary period of growth. Whereas in 1990, 5,855 people applied for degree courses in media studies, by 1995 this number had risen to 32,862 for media studies, with a further 12,039 for communication studies courses[3]. As the number of applicants grew, so did the controversy surrounding the educational modality. From 1994 onwards, a veritable polemic about the value of the combined modality developed in the national press in the UK (cf. Appendix IX).

The SCC benefited from this rise in the popularity in media studies to the extent that many, if not most students in the SCC degree chose the degree thanks to its media aspects. Indeed, although I will be analysing pedagogic discourse in the SCC curriculum as a whole, I will be particularly interested in analysing these media aspects as they were structured in a first-year 'media theory and practice' module[4] for which I was course tutor.

Why study the combined modality in general, and the media aspects of the SCC course in particular?

My principle motivation is a practical one. Soon after I first began teaching theory-practice courses on the undergraduate level (at the

Javeriana University in Bogotá, Colombia, in 1986), I became aware of the difficulty of teaching students to develop ideologically critical ways of engaging in media production. For this reason, I decided to investigate my own teaching, and that of other practitioners, as part of an effort to develop more effective ways of teaching 'media theory and practice'.

Unsurprisingly, my first efforts to investigate the pedagogic process drew on media and cultural studies, or what in Latin America is known as communication and culture studies. In particular, I focused the powerful light of critical theory on student learning practices. Critical theory enabled me to critique student learning practices as manifestations of instrumental reason and technical rationality. Critical theorists like Adorno and Habermas have explained that modern culture favours forms of knowledge which are conducive to an instrumental control and manipulation of social processes. The use of technology is accorded the status of an ostensibly value-free, and a-cultural "tool" which can be used for purely instrumental purposes. In my first years of pedagogic practice, it seemed clear to me that students were responding to my teaching along the lines of this ideology (conceived at that point as a 'world view'). They expected the teaching of media to be structured in ways that privileged the instrumental dimensions of communication. In this sense, teaching and learning an ideologically critical praxis in media production simply didn't fit within the dominant consciousness. Indeed, to the extent that my courses *contradicted* this consciousness, then an ideological process of contestation was likely to ensue. It followed that the educational problem was to find ways of engaging with the manifestations of the technical rationality within the learning place.

This argument is a seductive one, and one that I initially adhered to. However, and no doubt reflecting the shifts in cultural theory that were taking place in Latin America, after two or three years of teaching I began to realise that students' learning practices were not based on anything as "strategic" (Certeau 1984) as technical rationality. Rather, their responses seemed to reproduce a *bricolage* of discourses which combined a passion for playing with equipment, with everyday forms of empiricism, and with romantic and idealist conceptions of creativity.

It is for this reason that, with Gonzalo Rivera, a colleague at the Javeriana University in Bogotá, I decided to do an ethnography of students' reception of TV production. The ethnography was based on the theory of the French anthropologist, Michel de Certeau (1984) and revealed the many cultural 'tactics' and 'ruses' with which students re-articulated the

logic of TV production, and thereby the course as a whole. This research enabled us to reconceptualise the educational problematic on the basis of a far more complex model of domination, one which recognised the students' dominated, but culturally specific and tactical ways of appropriating the television technology[5].

The research yielded some important insights for my pedagogic practice. It made me more aware of the culturally specific nature of the television technology, and of its reception by students. Despite these insights, the research had some fundamental problems. It failed to conceive the pedagogic process as anything other than a simple mechanism for the reproduction of the cultural values associated with TV production. As part of this problem, the entire methodology of research lacked categories with which to describe the dynamics of the pedagogic process, *per se*.

This was problematic because any lecturer of television production (or any other subject, for that matter), necessarily engages in a process of selection of contents to be taught. S/he must present what is to be taught in a manner that fits with curricular structures, but also, with implicit or explicit educational theories and values. These procedures have the effect of transforming, however subtly, what is to be taught. What is the nature of this transformation, and what effect does it have on the subject matter that is taught? These were questions which were unthinkable in the framework which Rivera and I used for our reception research.

Of course, what is taught is not always what is learned. The research conducted with Rivera clearly showed that this was the case. But even if what is learned is not necessarily what is taught, it is problematic to entirely disconnect what *is* learned, from the structuring of the teaching. The teaching has a positioning effect on the learning process, even in those cases where the learning process contests the teaching. What is the nature of this 'positioning effect', and how does it relate both to the above process of transformation of contents, and to students' learning process? These too, were questions which we could not formulate, let alone answer.

The reason for both 'absences' was that we took it for granted that media and cultural studies were ideally suited for the study of any form of communication, including the pedagogic. We failed to understand the specificity of the process of pedagogic communication, and as a result we failed to see the need for a theory capable of explaining *pedagogic* communication, as distinct from other modalities of communication. I use the term 'pedagogic communication' to refer to the process whereby instructors select and transform contents for their pedagogic transmission,

but also, to the process whereby students selectively acquire (or fail to acquire) these contents.

At the same time that I became aware of these methodological problems, I began to realise that the 'theory-practice' problems I mentioned earlier were shared by other practitioners working in other universities. First in Latin America, and then in the UK, where I travelled to begin this thesis and to establish my residence, I participated in a variety of educational fora about teaching and learning media production. These enabled me to realise that my own educational interests and problems were shared by a number of colleagues. These colleagues were also finding it difficult to teach more reflexive dispositions amongst students, and were also seeking practical educational answers. As a result, what I had originally conceived as an individual, 'personal' experience became a shared, and collective experience. Indeed, the more I learned about my colleagues' pedagogic practice, the more I became convinced that, despite a great variety of theoretical orientations and foci, there were some basic pedagogic patterns and dynamics which seemed to be reproduced in most universities with degrees in 'media theory and practice'. This is the pattern which I have described as the combined modality, whereby a course juxtaposes the teaching and learning of media studies-- or at least, some field of research which is labelled as 'theory'-- with the teaching and learning of media production, which is labelled as 'practice'.

An awareness of this pattern, and the writing of this thesis in UK, away for the first three years from everyday teaching, allowed me to begin to denaturalise it. Whereas before I had taken it for granted, and had assumed that the pedagogic problem lay primarily in the cultural and ideologised *reception* of the courses, I was now able to question the modality itself. Why integrate media theory and practice? Indeed, were these labels-- media theory and media practice-- appropriate? Might these labels themselves be prompting ideologised forms of reception amongst students? It became clear to me that these more fundamental questions needed to be answered, and answered from an *educational* perspective which was capable of theorising what I earlier referred to as "pedagogic communication". Such a critical account I realised, would have to inform any effort to propose new forms of pedagogic practice.

But what 'educational perspective' could I use? One option was to use one of the existing 'grand theories' of education (e.g. Freire 1972), or indeed one of the many primers for pedagogic communication which have recently been developed for higher education in the UK[6]. Throughout this

thesis, I will refer to these theories and primers *for* pedagogic practice (as distinct from theories *of* pedagogic practice), as **theories of instruction** (Bernstein 1990). In some contexts, and for some lecturers, these theories of instruction may be useful. They have, however, some fundamental problems. Although some are quite sophisticated and critical, many are little more than a collection of anecdotal recommendations. And although the more critical theories may enable the practitioner to reflect on her/his own practice, I could find no theory of instruction that actually addressed the problems which I have begun to articulate in this introduction. This was as true for the general theories of instruction, as it was for the more specific proposals put forward by researchers in the field of Media Education[7]. As I explain in more detail in Appendix I, research in this last field was more oriented towards the development of critical 'reading' practices in earlier levels of education. Moreover, researchers in Media Education tended to use media and cultural studies to articulate educational phenomena, thereby reproducing some of the problems I critiqued above when referring to the research I conducted with Rivera.

The absence of published research about the combined modality, and my desire to research and improve my own practice (which I took up again in the SCC course after three years of full-time research), suggested the need for what Carr and Kemmis (1986) describe as "Educational Action Research". Research which is conducted by the educational practitioner, in order to improve her/his own practice in ideologically critical ways. In the absence of research about my particular subject, and given my desire to transform my own practice, Carr and Kemmis's methodology for action research seemed appropriate. Appendix I provides a detailed description of this methodology. However, it also provides a detailed critique, and an explanation of why, in the end, I decided not to use it.

The above account may seem to suggest that Educational Action Research was a 'dead end'. But critiquing Carr and Kemmis's work was useful in that it forced me to theorise and clarify my own stance vis-a-vis the problems of researching one's own practice. This is a complex and difficult subject, especially if one gives up the certainties afforded by positivist and naturalist forms of research (Hammersely & Atkinson 1983). An entire thesis could be written on this subject alone. Given the necessarily limited focus of and space for my research, I have decided to leave the detailed argumentation in Appendix I, and to simply highlight some of the issues in the paragraphs that follow.

The critique of positivist conceptions of educational theory. I share

Carr and Kemmis's (1986) critique of theoretical approaches which reproduce positivist orientations to social scientific research (cf. Appendix I). The problem is not to find the 'covering laws' of educational practice in combined courses, let alone empirically verifiable "causes" and their "effects". Rather, the problem is to understand the ways in which the different participants represent and understand the educational process. This entails a 'hermeneutic' epistemology and a 'semiotic' methodology, for which the problem is to explain meaningful action (cf. Appendix I, and chapter one).

The problem of 'bonne distance'. Hermeneutics reveals the epistemological naiveté of conceptions of social research which attempt to ground the validity of research on a radical distinction between the researching subject and the researched object. The problem is not to find ways of isolating the researching subject from the researched object (as in positivist approaches to research), but to understand that in the social world the researching subject always researches other social *subjects*, on the basis of ineluctably evaluative systems of classification. It follows that a researching subject's belonging to the context does not automatically disqualify her/him from researching it (as might be suggested by those who argue for the need for a radical 'bonne distance' from the researched phenomenon). On the contrary, the opposite can, and is argued by the advocates of action research: that the validity of social research, especially when it is oriented towards achieving the transformation of the researched subject, is contingent on the extent to which the research enables the researched subject to denaturalise her/his own understandings of a context, and to become agents in the process of transformation of their own pedagogic practice. This suggests the need for the active participation of the researched subjects, in the design, and development of the research process.

The critique of substantive-grounded theory. It would however be naive to assume that it suffices to do research which is based on commonsense theorising by the concerned subject, in this case the teacher, her/himself. In this sense, I agree with those who, like Carr and Kemmis (1986), propose that practitioners researching their own practice must develop systematic, and intersubjective research criteria if they are to produce more critical interpretations of their own practice. But unlike Carr and Kemmis, I am convinced that the research will always be shaped at least in part by the cultural and political discourse of the practitioner, by her/his interests, subjectivity, and participation in the context. For this

reason, I do not accept Carr and Kemmis's suggestion that the practitioner should research her/his practice on the basis of the principle of substantive grounded theory (Glaser and Strauss 1967): an inductive process, whereby the practitioner builds a theory of her/his own practice from a theoretical degree zero. This is ultimately an untenably empiricist proposal: no researcher can ever begin from a theoretical (let alone a cultural) degree zero. This is particularly true when the practitioner researching her/his practice is, by training and profession, a researcher, as is true in my own case.

Theoretical vs. Practical Theory. A key proposal made by Carr and Kemmis's is that the practitioner must develop a "practical" theory (a theory which is expressly designed to transform pedagogic practice) as opposed to a "theoretical" theory (research which is not meant to have any practical application). According to the authors, only the "practical" theory and research enables practitioners to transform their practice. With Hammersley (1992), I suggest that so-called "theoretical" research in fact *can* eventually have both indirect and direct practical applications[8]. As I will explain in chapter five, so-called theoretical research can be used to transform practice, as long as the researcher-practitioner recognises that "theoretical" research requires the development of a mediating theory of instruction if it is to have practical applications.

For all of the above reasons, my own research will not use the methodological proposals of Carr and Kemmis. Instead, I will use the social semiotic theory of Basil Bernstein (1975;1990;1996), which I will describe and justify in detail in chapter one. By using Bernstein's theory, I hope to provide myself with a degree of bonne distance, and to provide others with the possibility of evaluating my research. I am however under no illusion that the use of Bernstein's theory acts as a guarantee of objectivity. I assume from the outset that aspects of my own practice will remain invisible to myself. Having recognised this, I nevertheless believe that doing the research myself will provide a degree of reflexivity and self-reflexivity in my own teaching practice which I would not achieve otherwise. And that is the fundamental object of this research.

The following is the structure that I will use to organise my research. In chapter one, I will introduce and justify my use of Bernstein's theory of pedagogic communication. In chapter two, I will use this theory to describe the structuring of pedagogic discourse (cf. chapter one) on the level of the Science, Culture and Communication (SCC) course, as a whole. In chapter three, I will shift to an analysis of pedagogic discourse in one of the course's

curricular units, the first-year "Communicating Science" module, which I taught as a theoretical-practical media studies module from 1993 until 1997. In chapter four, I will analyse student receptions of both the SCC course as a whole, and the Communicating Science module in particular. Finally, in chapter five I will use the results of my research to propose a theory of instruction -- a theory *for* pedagogic practice-- which is specific to the structures, dynamics and pedagogical problems revealed by the previous chapters.

Notes

[1] The name of the course has been modified to protect the identity of its practitioners. For this same reason, I will not identify the university involved. I will merely refer to it as 'the University'.

[2] Although I will concentrate on analysing the teaching of media studies and media production in this thesis, much of what I will say may also be meaningful in courses which teach media production with media and cultural studies, communication studies, communication and cultural studies, as well as film studies, television studies, and image studies. I recognise that there may be significant differences in orientation between, and indeed *within* these categories. However, what interests me at this point is their similarity from the pedagogic perspective: these courses tend to mix the teaching of what is frequently labelled as 'media theory', with media production, or 'media practice'.

[3] Statistics produced by the Universities and Colleges Admissions Service, and reported by N. Cohen in The Independent on Sunday, 25 June 1995.

[4] By 1995, the University had not fully modularised its courses. Plans were to achieve full modularisation by the end of the century. Even so, from the early 1990's onwards, the University made use of the discourse of modularisation. For this reason, and also to help to distinguish the different levels, I will use the term "module" to refer to a particular curricular unit, and "course" to refer to the curriculum as a whole.

[5] I presented the results of this research in the IV International Television Studies Conference in London, in 1991.

[6] See for example Gibbs & Habeshaw (1989); Newble & Cannon (1991); Gibbs & Jenkins (1992); Cox (1994).

[7] See for example, Alvarado et al. (1987); and Masterman (1980 & 1985).

[8] I also believe in the opposite possibility: that so-called "practical" research, in both the empirical and instrumental senses of the term, can eventually lead to the reinterpretation of "theoretical" approaches.

Chapter 1

Media theory and practice as pedagogic discourse

Introduction

In the introduction of this thesis, I explained that the process of pedagogic communication is not a transparent, neutral, or indeed simple mechanism for the transmission of educational contents. I explained that pedagogic communication not only transforms the contents that are taught, but also positions the participants in the educational exchange. This according to underlying cultural values and political orientations. For this reason, pedagogic communication must be analysed with a theoretical framework that is capable of articulating its procedures, complexity, and opacity. In this chapter, I will introduce such a theoretical framework. The framework is Basil Bernstein's (1975;1990;1996) social semiotic theory of pedagogic communication, and therein, his theory of pedagogic discourse.

I will introduce Bernstein's theory as follows: in section one, I will characterise Bernstein's theory as a form of social semiotics. In section two, I will discuss three fundamental concepts in Bernstein's theory: the concepts of classification, framing, and code. In section three, I will introduce Bernstein's theory of the pedagogic device, which is central to his theory of pedagogic communication. In section four, I will describe some modalities of pedagogic practice which Bernstein has described with his theory. In section five, I will propose some modifications to Bernstein's theory that make it more suitable for the analysis of the pedagogic phenomena which I discussed in the introduction. Finally, in section six, I will use the theory to formulate the research questions which will guide my investigation.

1. A social semiotic theory of pedagogic communication

There are many ways of conceptualising the process of pedagogic communication. Although Bernstein is a sociologist of education, his theory of pedagogic communication can be characterised as being based on a **social semiotic** conception of the educational process. In this section, I will describe this conception, and I will discuss some of the methodological shifts it entails vis-a-vis more traditional sociological and indeed semiotic

approaches.

Despite the fact that he describes himself as a sociologist, it is interesting that Bernstein (1975; 1990) characterises his own work as constituting a social semiotics of pedagogic communication. M.A.K. Halliday (1978) can be credited with coining the term "social semiotics"[1]. The addition of the word "social" to semiotics is meant to signal an interdisciplinary approach which links the study of the internal structuring of texts, with the study of the social structures that govern the production, construction, and reception of texts. Social semioticians assume that these structures are ideological, in the sense that they develop and maintain relations of inequality within and between social groups.

Bernstein's approach is a social semiotic approach to pedagogic communication inasmuch as he treats the various levels of pedagogic practice as texts; and inasmuch as he treats texts as realisations of social relations which are constituted by unequal or asymmetric distributions of power. I will now comment in some detail on each of these methodological displacements.

I will begin the the displacement which is known in the social sciences as the **textual analogy**. Like many other social theorists, Bernstein treats actions, and indeed institutional processes, as if they were a text[2]. We can provisionally define the category of text as a form of language that is "functional", that is, it plays some part in generating meaning in a particular context (Halliday & Hasan 1985: 10). Bernstein's approach is based on a textual analogy inasmuch as it treats both linguistic, and non-linguistic forms as playing a part in generating meaning in pedagogic contexts. This enables Bernstein to regard all levels of pedagogic practice-- spoken, written, visual, postural, or other-- as text (Bernstein 1990:175). But as I will explain in section three (below), it also enables Bernstein to explain the structures that govern the pedagogizing of knowledge by analogy to the structure and function of grammar in language.

This shift has methodological implications of considerable significance. The most obvious of these is that the researcher can analyse not just the linguistic realisations of educands, but also other forms of 'textual' production, such as drawings (cf. Daniels 1989). A more subtle implication of the shift is that it is necessary for the development of an approach which can systematically analyse the links between different levels of the pedagogic process. A problem faced by many educational researchers involves the linking of specific classroom practice (or so-called

micro-pedagogic aspects) with organisational structures, and these with broader social processes (so-called macro-pedagogic aspects). Each of these levels is frequently analysed separately, or with different theories. By treating the micro- and macro-pedagogic as texts, and indeed as different levels of a [social semiotically conceived] process of communication, Bernstein's approach enables him to study all levels as part of one same process.

One of the problems with some of the first forms of semiotic analysis was that they decoupled the study of the internal structuring of texts, from the study of the social structures that lead to the production, structuring, and reception of these texts. This led not just to a problematic form of decontextualization, but potentially, to a form of idealisation of the production of meaning. Bernstein avoids this problem in two inter-related ways: first, by treating pedagogic texts as realisations of *interactional* practices; and second, by treating the interactional practices as the realisation of relations of power.

I will discuss the first aspect, first. According to Bernstein, "the text is the form of the social relationship made visible, palpable, material" (1990:17). The pedagogic text both carries the social relation, and is a part of the social relation. Put differently, the social relation is produced both *within* the text, and *in relation to* the text. The first level, which Bernstein calls "relations within", involves the internal constituents of the pedagogic text in the process of its communication at whatever level is chosen for the analysis: classroom, curriculum, educational system, or other (1990:172-3). This internal structuring of the text creates, positions and oppositions pedagogic subjects, that is, pedagogic forms of subjectivity. The second level, which Bernstein calls "relations to", involves the actual or empirical pedagogic subjects' interaction with the pedagogic text, as determined by his/her social class, gender, 'race', or any other discriminating attribute (1990:172-3). According to Bernstein, a theory of pedagogic communication should be able to explain each of these levels, and their relation to each other.

The reference to the importance of discriminating attributes leads on to the question of the relation between pedagogic texts and power. Bernstein's overarching research project is to study the way in which knowledge is differentially distributed and acquired in societies structured by advanced forms of capitalism. Bernstein is particularly interested in the role played by class structures in this process. In this sense, his work is clearly of a Marxist orientation.

Given this orientation, it may seem odd that the concept of ideology is virtually absent from Bernstein's theory. Indeed, there is no formal conceptualisation of the concept of ideology, per se; there are just a few, brief references to the term, in a few of the essays. In his most recent work, Bernstein suggests that the reason for this is that his theory of pedagogic communication is in effect a theory *of* ideology: "the reason why ideology has not been mentioned is for the reason that this system constructs ideology. Ideology here, is a way of making relations" (Bernstein 1996: 30-31).

This last point requires some explanation. In Bernstein's theory, and indeed throughout this thesis, ideology is not conceived as a content which distorts some external reality. Nor is it treated as a "world view"[3]. It is conceptualised as a *relation of domination.* According to this approach, pedagogic texts act to develop and sustain relations of domination between social groups in society. They do so by classifying and framing (cf. section two, below) knowledge in ways which produce and reproduce the dominant groups' forms of subjectivity. The task of social semiotic analysis, as applied to the domain of pedagogic communication, is to show how pedagogic communication produces and/or reproduces--and at times contests-- such forms of subjectivity. In this sense, a social semiotic analysis of pedagogic communication is synonymous with the analysis of ideology, so defined.

2. The fundamental concepts: classification, framing and code

One of the ways in which Bernstein's theory politicises pedagogic communication is by means of a series of categories which show the fundamental links between pedagogic relations and power. In this section, I will describe these concepts. They are the concepts of classification, framing, and code.

Simplifying greatly, we can say provisionally that the concept of classification has to do with what is taught; and framing, with how something is taught. We can also say provisionally that the concept of code refers to rule-bound principles for the articulation of these two dimensions (classification and framing). Codes determine what is taught, and how it is taught.

Though helpful as a first approximation, this account fails to represent the full complexity and degree of specialisation which the terms have in Bernstein's theory. In Bernstein's theory, the concept of

classification refers not just to the process of pedagogic selection, but more fundamentally to the *relation* between categories (Bernstein 1996). In particular, the degree of *insulation* between two or more social categories (e.g. the different course subjects that are taught in a curriculum). If there is a high degree of insulation, then there is strong classification, and vice-versa: if there is a low degree of insulation, then there is a weak classification. The greater the insulation between the categories, the stronger the classification.

Bernstein suggests that to classify something in a particular way is to exercise power. In media and cultural studies, it is recognised that one of the fundamental means by which social groups can develop and sustain relations of domination is by determining how some phenomenon is classified: as terrorism or as a holy war, as erotic or as pornographic, and so forth. Bernstein's conception of classification is similar to this insight, but more specialised in its orientation. Bernstein is more interested in providing an account of how principles of classification operate to establish, and especially to *insulate* different categories. To the extent that the insulation determines 'what goes with what'-- or what *doesn't* go with something-- then this constitutes for Bernstein the fundamental process of power.

This more specialised orientation is partly the result of Bernstein's object of research: a key, perhaps *the* key principle for the development of relations of power in pedagogic communication is to divide knowledge into course subjects which are then taught as being more or less separate. But the emphasis on insulation is also the result of a particular anthropological conception of boundary-making: social groups maintain or weaken their power by preserving or changing the degree of insulation between categories: between what is legitimate and illegitimate, what is sacred or mundane, and so forth.

Whereas classification refers to what knowledge is insulated, and how [strongly] it is insulated, **framing** refers to how the knowledge is communicated: to "how meanings are to be put together, the forms by which they are to be made public, and the nature of the social relations that go with it" (Bernstein 1996:27). Framing "regulates relations within a context, it refers to relations between transmitters and acquirers, where acquirers acquire the principle of legitimate communication" (Bernstein 1996:27). If the framing is strong, then the educator explicitly regulates the form of interaction, and thereby exercises a more explicit control over the forms of conduct and the realisation of messages in a given context. If the framing is weak, the regulation is more implicit, and the acquirer will

appear to have a greater power in determining the nature of the pedagogic interaction. However, the greater power of the acquirer may be more apparent than real.

Bernstein distinguishes between two levels of rules which are determined by framing: the rules of social order, and the rules of discursive order. The rules of social order govern the forms that hierarchical relations take in the pedagogic relation, as well as the expectations concerning conduct, character, and manner (Bernstein 1996:27). The rules of discursive order regulate the selection of what is to be communicated at a particular point and time; its sequencing; its pacing; and the criteria for communication (Bernstein 1996:28). Bernstein calls the latter the **instructional discourse**, and suggests that it is embedded in the former, which he renames the **regulative discourse**. I will return to these two concepts in section 3.2, below.

According to Bernstein, the concepts of classification and framing may vary independently from each other: classification may be strong, and framing weak, or vice-versa. So it is, for example, that a course subject may be very strongly insulated from other course subjects (strong classification) but may be taught with relatively implicit forms of sequencing, pacing, and criteria for what counts as legitimate communication about the course subject (weak framing).

Moreover, classification and framing may have both external and internal values. A certain principle for the classification of a course subject in a curriculum may establish both the degree of insulation between this course subject and other course subjects (external classification), but also, the form of classification of space and objects *within* the course subject (internal classification). The same may be true for framing: a certain principle of framing may regulate not only what counts as appropriate realisations within a context, but also, what forms of communication may enter or not enter that context.

It is worth noting that the distinction between classification and framing is an analytical distinction. In pedagogic practice, the two aspects are as ineluctably inter-twined as are the paradigmatic and the syntagmatic dimensions of any text. Indeed, it is possible to characterise the process of classification as operating on the dimension of the paradigmatic, and the process of framing as operating on the dimension of the syntagmatic.

For the exercise of power and control over social relations to be effective, Bernstein suggests that it is necessary to mediate not just the

selection and formulation of knowledge, but also its acquisition. In order to do so, Bernstein develops a set of corresponding concepts which explain the recognition of taught categories, and of the capacity to communicate about these categories in legitimate ways. The **recognition** rule enables the acquirer to recognise the nature of a particular context, and to recognise when communication is or is not appropriate to that context. The social distribution of this rule is a function of power: not all possess the recognition rules for a given context, and this constitutes a fundamental way of including or excluding an individual or social group from communication in a given context. The **realisation** rule determines how the acquirer puts together a message for a given context, and makes it public. An acquirer may possess the recognition rule, but not the realisation rule: s/he may recognise what counts as legitimate text for a given context, but may not be able to her/himself produce such a text.

After the above characterisation, it should be clear that the forms of classification and framing, and the rules of recognition and realisation that go with them, have a positioning effect on pedagogic subjects. Here I refer not to subjects as in 'course subjects', but to subjects as 'persons'[sic] or socially determined forms of subjectivity. Depending on the forms of classification and framing, subjects may be included or excluded, may have greater or lesser power to communicate within a particular context.

I now wish to discuss the concept of **code**. When forms of classification and framing sediment into particular modalities, then we have pedagogic codes. In the work of many semioticians and anthropologists, the concept of code is defined as a culturally given system of rules which controls the production of meaning. Several different accounts have been offered as to how such systems operate, leading to a number of highly precise formulations of the concept[4]. Bernstein's formulation treats codes as specific modalities of classification and framing. It defines codes as "tacitly acquired regulative principles which select and integrate relevant meanings, forms of their realisation, and evoking contexts" (1990: 14).

It is important to note that, in this formulation, codes operate not just within contexts, but between contexts. Indeed Bernstein suggests that the unit for the analysis of codes is not a single utterance or context, but rather, the relationship between utterances, between contexts:

> Code is a regulator of the relationships between contexts, and, through those relationships, a regulator of the relationships

> *within* contexts. What counts as a context depends not on relationships within, but on relationships between, contexts. The latter relationships, *between,* create boundary markers whereby specific contexts are distinguished by their specialised meanings and realisations (1990:15; emphasis in the original).

It is in this sense that Bernstein suggests that codes are culturally determined *positioning* devices[5]. Codes determine the position of social categories, and thereby social subjects, in relation to each other. To the extent that this is the case, then codes constitute from the methodological point of view, a key category for the analysis of ideological relations. Bernstein is particularly interested in class-regulated codes, which position subjects with respect to dominant and dominated class forms of communication, and the relations that go with them (Bernstein 1990:13). He nevertheless recognises that class-related codes are not the only ones, or indeed the most important ones in all relations of domination. Codes related to gender, 'race', ethnicity, and a variety of field-based relations can also lead to relations of domination.

3. From pedagogic codes, to pedagogic discourse: the pedagogic device

In section one I explained that Bernstein's theory develops what I called a transformational grammar of pedagogic communication. In this section I will describe this transformational grammar, which Bernstein refers to as the **pedagogic device**. The pedagogic device provides rules which regulate pedagogic communication. It acts selectively on the pedagogic meaning potential, where "meaning potential" means the potential discourse that is available to be pedagogized (Bernstein 1996:41). It is, in this sense, a "macro-framing" process, which Bernstein suggests plays a function in pedagogy which is analogous to that of the grammars of language. It regulates the process of cultural production, reproduction, and transformation. And, like grammars in language, it provides what Bernstein describes as a **symbolic ruler of consciousness**. A way of creating, positioning, and oppositioning pedagogic subjects (1990:189), and thereby, social forms of identity. Just as the different modalities of classification and framing constitute positioning devices on a lower level of the pedagogic relation, so too, the pedagogic device constitutes something akin to a "macro-positioning" process: the pedagogic device positions the educational field, in relation to the field of production.

Perhaps the best way to illustrate this aspect of Bernstein's theory is by returning to the problematic of media theory and practice, which I discussed in the introduction of this thesis. I explained that all pedagogic processes transform what they communicate. Later in this thesis, I will show how combined courses in media studies transform the theory and practice of media studies, into "media theory"; and the (discursive) theory and practice of media production, into "media practice". This transformational process leads to a new ethical orientation for each of the cultural categories which are transformed: in many, though not all degrees, the role of media studies becomes that of providing the guide-lines for an ideologically critical praxis in media production; and the role of media production becomes that of representing the world in more critical ways.

The above example is just one of many that could be used to illustrate a transformational process which, according to Bernstein, always occurs in pedagogic communication. Bernstein argues that this is a process which has been taken for granted by the sociology of education, and in general, by theories of cultural reproduction. Bernstein argues that sociologists of education have been concerned with the problematic of the acquisition of knowledge, and therein, with the ways in which educational messages reflect "biases" of class, gender, ethnicity and 'race'. In doing so, they have assumed that pedagogic communication simply reproduces class, gender, and other forms of "bias". This in turn has meant that they have failed to treat pedagogic communication as a complex process that entails a socio-cultural mediation by specialised structures, and structuring principles[6]. To use one of Bernstein's favourite metaphors, existing research has examined the effects of the pedagogic relay, and even the relation of specific groups to the relay, but not the relay itself.

Bernstein's theory of the pedagogic device is a theory of this "relay". The theory of the pedagogic device describes the transformation, and the social effects of the transformation which occurs when knowledge is pedagogized, that is, when it is transformed into a content to be taught and learned by means of pedagogic communication. The theory explains that this process is not an instance of the simple reproduction of the knowledge, or even of the sociopolitical orientations which dominate any particular field, or social context. The pedagogizing process entails a dynamic of mediation which transforms the knowledge into entities with at least partially different social orientations. To the extent that this is so, the logic and transformational effect of this process needs to be explained if the pedagogic process is to be fully understood.

What then, *is* the logic of this transformational grammar? According to Bernstein, the pedagogic device regulates the cultural process whereby the discourses generated in different **fields** are mediated by different levels of rules. Before describing the different levels of rules, I will briefly discuss the concept of field. To the extent that Bernstein is interested in explaining the way in which the educational context transforms knowledge generated in different contexts, he needs a theory of context. The key category for this theory is the concept of **field**. Bernstein develops this concept in much the same way as Bourdieu does (1977; 1986): that is, as a space of social positions, constructed as trajectories which develop over time. However, Bernstein suggests that his account is more specialised than Bourdieu's. Bernstein distinguishes between primary, secondary, and recontextualizing fields. The **primary context** or **field of production** constitutes the intellectual field of education: where 'new' ideas are selectively created, modified, and exchanged and where specialised discourses are developed. (Throughout this thesis, I will use the terms "primary context" or "field of production" interchangeably to refer to the field which generates the discourse or discourses that are mediated by pedagogic practice.) The **secondary context** or **field of reproduction** is the level that mediates or "recontextualizes" (cf. section 3.2, below) the knowledge generated in the primary context, for the purposes of pedagogic transmission and acquisition. It involves the production and reproduction of pedagogic discourses (cf. section 3.2 below), and in formal education is constituted by preschool, primary, secondary, and tertiary levels of education. The **recontextualizing field** regulates the movements of texts between the primary and the secondary contexts. It is constituted by official regulating entities of the state and local educational authorities; and by the different fields (higher education specialised in education; specialised media of education; and any other) which exert an influence on the process of recontextualization (1990: 191-192).

Bernstein believes that there is something like a grammar that regulates the process whereby knowledge is relayed from one context to the other. This grammar is constituted by three sets of inter-related rules: on the level of the primary context, there are the **distributive** rules. On the level of the secondary context, there are the **recontextualizing** rules. Finally, the realisation of the grammar in particular pedagogic texts is governed by **evaluative** rules. I will briefly describe each of these rules in turn.

3.1 The distributive rules

The distributive rules operate on the level of the field of production and are fundamental to the pedagogic device. They construct a relation between power, social groups, and forms of consciousness by means of controls on the specialisation and distribution of different orders of meaning (Bernstein 1990: 181). These rules create the fundamental cultural categories for any pedagogic process, and determine who has access to them. The operation of this rule is described by Bernstein as a matter of culturally fundamental classification and framing: the distributive rule determines the boundary between what is the thinkable and the unthinkable in culture (classification), but equally, the distribution of the resulting knowledge between different social groups: what is thinkable and unthinkable *by whom*, who can *communicate* what to whom, in what *way* and in what *circumstances* (framing).

According to Bernstein, there is always a potential "gap" or "space", a "site of the 'unthinkable'" which is the meeting point of order and disorder, coherence and incoherence, and thereby a potential for a new order of relation (1990:182) (I will refer later to this gap as a "discursive gap"). Distributive rules attempt to regulate the realisation of that potential, and this in a way that acts to further the interests of the social ordering which the rules create, maintain, and legitimate (1990:182). However, Bernstein notes that this process is generally not without contradictions, and dilemmas. These may be active both between and *within* the subjects that work to create the order. *As such, they form a potential for transformation which is intrinsic to the system of classification and more generally, to the pedagogic device.*

3.2 The recontextualizing rules and pedagogic discourse

The distributive rules describe the culturally fundamental forms of classification and framing, as they occur in fields of production. In this sense, they are fundamental to the pedagogic device. However, inasmuch as the function of the theory of the pedagogic device is to describe the process of transformation which occurs when knowledge is pedagogized, then the next level of rules-- the recontextualizing rules-- is central to Bernstein's theory.

According to Bernstein, the structuring principle for the process of pedagogic transformation is provided by pedagogic *discourse.* In order to

understand this last category, it is necessary to engage in a brief theoretical excursus about the category of discourse, itself. A number of researchers define discourse in different ways. Some scholars treat discourse as a relatively depoliticised category of language use[7]. That is, they treat the concept of discourse in ways that are not entirely dissimilar from Saussure's (1983) category of "parole". In so doing, many researchers also treated the category of discourse as a species of text, or vice-versa[8].

The use given to the term by Bernstein is in marked contrast to this tendency and is derived in part from the work of Michel Foucault. In Foucault (1993), discourse refers to systematically organised ways of representing phenomena, which produce and reproduce the values and orientations to meaning of particular institutions. As developed by Foucault, the concept is meant to reveal the ways in which scientific, legal, penal, educational and other institutions construct accounts of reality or aspects of reality which appear to be objective, but which are shaped by institutional codes, values, and interests. Subjects within institutions communicate in ways which are shaped and constrained by particular discourses that position them in relation to institutionally determined identities, orders, and moralities.

In the most general sense, Bernstein's theory of pedagogic discourse is clearly indebted to Foucault. In Bernstein's theory, as in Foucault's, discourse is treated as a process which constructs representations of the world in ways which produce and reproduce the meanings and values of particular institutions. Moreover, in Bernstein's account, as in Foucault's, text is treated not as a species of discourse, but as a realisation[9] of discourse. The relationship between text and discourse is treated dialectically: discourses are realised by means of texts, but texts are themselves always transformations of discourse.

Despite this fundamental similarity, there are differences in focus between Bernstein's work and Foucault's. Bernstein's theory is more specialised. He develops a theory of discursive structures and processes which describes specifically *pedagogic* discourse[10]. The greater specialisation is particularly evident in Bernstein's account of the recontextualizing rules. The recontextualizing rules provide "the rules of specialised communication by means of which pedagogic subjects are selectively created" (Bernstein 1990: 183). This process is governed by pedagogic discourse. **Pedagogic discourse** is a relatively invisible discourse, whose speciality is to bring together, or *recontextualize* other discourses. "Pedagogic discourse is a principle for appropriating other

discourses and bringing them into a special relation with each other for the purposes of their selective transmission and acquisition" (1990:183-4). It is in effect, a framing principle: the rule for embedding and relating two discourses: an **instructional discourse**, or a discourse of specialised skills or competences, is embedded in a **regulative discourse**, that is, a discourse which establishes a specialised order, relation, and identity (Bernstein 1990: 183). Pedagogic discourse is "invisible" in the sense that it is not what is embedded or even what embeds, but rather, the embedding principle. In this sense, it is easily confused with either the instructional discourse, or the regulative discourse. (The former confusion is probably more common to the extent that even the regulative discourse is relatively invisible to those who are unaware that discourses always carry messages concerning morality, order, and identity.)

So the function of pedagogic discourse is to **recontextualize** other discourses. The process of recontextualization is a central one in pedagogic practice, and is characterised in some detail by Bernstein. The instructional discourse, and its inscribing texts, are produced in a certain context. When a pedagogic discourse appropriates these, they undergo a transformation prior to their relocation in the new (pedagogic) context (Bernstein 1990:184). Bernstein suggests that the form of this transformation

> is regulated by a principle of *decontextualizing*. This process refers to the change in the text as it is first delocated and then relocated. This process ensures that the text is no longer the same text:
>
> 1. The text has changed its position in relation to other texts, practices, and position.
> 2. The text itself has been modified by selection, simplification, condensation, and elaboration.
> 3. The text has been repositioned and refocused.
>
> (Bernstein 1990: 192)

According to Bernstein, "the decontextualizing principle regulates the new ideological positioning of the text in its process of relocation in one or more of the levels of the field of reproduction" (1990:193). Once the text is in the new field, it undergoes a further transformation or "repositioning". For this reason, Bernstein suggests that

> it is crucial to distinguish between, and analyse, the relations between two transformations, at least, of a text. The first is the transformation of the text within the recontextualizing field, and the second is the transformation of the transformed text in the pedagogic process as it becomes active in the process of the reproduction of acquirers. *It is the recontextualizing field which generates the positions of pedagogic theory, research, and practice.* (Bernstein 1990: 192-3; emphasis in the original).

I will discuss the validity of the above methodological recommendation in section five, below. For now, I wish to turn to the level of the evaluative rules.

3.3 The evaluative rules and the realisation of pedagogic practice

As defined by Bernstein, the evaluative rules constitute the principles which regulate the transformation of pedagogic discourse into pedagogic practice. Put differently, this level of the pedagogic device is the one that governs the transformation of the transformed discourses, into specific pedagogic texts and contexts for the transmission and acquisition of these discourses. The recontextualizing principle produces a specialisation of time, text (strictly speaking, or metaphorically), space, and their inter-relation (1990:185-187). The evaluative rules provide principles for the transformation of each of these "axes" into actual realisations of pedagogic text.

Bernstein provides a brief sketch of the practical transformations which occur on each of these semiotic axes. I will begin with the axis of time. Pedagogic practice produces, as Bernstein puts it, a *punctuation* of time. This is one of the functions of the curriculum: to produce a periodization of knowledge. Knowledge is divided into temporal units. But pedagogic practice is also based on a periodization of the times of *acquisition* of knowledge. Cultures attribute a "time of life" for the learning of particular forms of knowledge, and educational systems reflect this by segmenting the educational process into levels, which generally correspond to particular ages: primary, secondary, further education, and so forth.

An analogous transformation occurs with respect to the production of texts for teaching and learning. Discourses in the primary field are realised by means of particular texts. As I explained earlier, these texts are recontextualized by pedagogic discourse. The process of recontextualization produces new texts, which must then be transformed into *pedagogic* texts:

texts to be taught and learned. Evaluative rules determine the form of these texts, as well as the times and places for their acquisition. Indeed, pedagogic *space* is also the result of a set of transformations. Discourses in the primary context are associated with certain social spaces, in the literal and metaphorical sense of the term. In the cultures of advanced capitalism, there tends to be a strong classification of the teaching and learning space: separate spaces are reserved for the teaching and learning process. The evaluative rules determine not just the general nature of the trans-- or re-location of discourses into pedagogic spaces, but also their embodiment in specific architectures and pedagogic topographies: the style of the school building, its layout, the classroom, the distribution of spaces within the classroom, and so forth.

Clearly, each of these axes of pedagogic practice is related to the other. In pedagogic practice, there is a time and place to acquire particular texts. The inter-relation of these according to specific modalities or codes, is also a function of the evaluative rules.

4. Some modalities and levels of pedagogic practice

The above formulation provides a useful, albeit highly abstract representation of the nature of pedagogic communication. I now wish to introduce some forms of pedagogic practice which are generated by the pedagogic device as a whole, but which embody particular evaluative rules. Bernstein describes these in both his early and his later work[11], and they provide categories for the analysis of pedagogic practice.

4.1 Collection and integrated codes

To begin with, the practical nature of Bernstein's concept of code, and thereby of classification and framing can be illustrated with reference to two different modalities of pedagogic practice. Bernstein refers to these as the collection, and the integrated codes (1996:25).

In educational institutions which operate according to the logic of the **collection** code, there is a strong internal classification (that is, a high degree of insulation) of the different discourses being taught. There is also a strong insulation of the institutional departments which are responsible for the teaching of each of these discourses. The two forms of insulation are

part of a single orientation, which is based on a strong classification of categories. The effect of this coding orientation is that staff are tied to the discourse that they teach, and to its organisational base. From the perspective of framing, there is very weak, if not non-existent horizontal communication across discursive divides, and the contents of each bounded domain are not be open to public discussion and challenge.

The above refers to *internal* forms of classification and framing. According to Bernstein, the collection code also tends to generate a strong external classification and framing, that is, a strong insulation of what counts as being inside and outside of the institution, and explicit rules governing communication with the outside world. There is also a hierarchy of knowledge between the so-called common sense, and the so-called uncommon sense (Bernstein 1996:25).

Where this code prevails, a corresponding curricular type is found. Before I explain this type, it is worth noting that the **curriculum** is in general a key category of pedagogic practice. However, Bernstein's conceptualisation of the curriculum is prior to his development of the theory of pedagogic discourse, and for this reason I am forced to locate the category within later developments in his theory. All forms of curricula provide, in terms of Bernstein's earlier theory, the principle by means of which "certain periods of time and their contents are brought into a special relationship with each other" (1975:79). In terms of Bernstein's later theory, it is possible to suggest that the curriculum is one of the operations of pedagogic practice which are governed by evaluative rules, and which punctuate especially the times of teaching and learning. The curriculum provides a concrete periodization of what will be taught and learned: so much time will be allotted for one subject, so much for another, and so forth. But it also acts to determine what pedagogic texts will be taught, and how they will be insulated from one another: this time will be devoted to this text (in a metaphorical sense), and that time, to that text. In this sense the curriculum begins to reveal what modalities of classification are being produced or reproduced in a given institution or educational context. To the extent, finally, that curricula also constitute an instance of the combination of discourses, they provide an insight to the logic framing, or the logic of recontextualization that structures the pedagogic process.

Bernstein suggests that in **collection type** curricula, which are based on a collection code, contents "stand in a closed relation to each other, that is (...) the contents are clearly bounded and insulated from each other" (1975:87). The learner has to collect a certain set of contents for the

purposes of evaluation. Although there may be some underlying concept of collection (Bernstein uses examples of the gentleman, the educated man, skilled man [sic]), this modality will not be based on an explicit principle for the integration of each unit. Bernstein establishes a continuum of specialisation with which to characterise collection-type curricula: the specialised contain a narrower range of course subjects which are tested, while the nonspecialised have a broader range.

In institutions where the **integrated** code prevails, there is a weak classification between the discourses being taught (internal classification) and indeed, between what counts as being inside and outside the educational institution and specific pedagogic encounters (external classification). Bernstein suggests that such a modality is vulnerable because communications from outside the institution are less controlled. This modality, he further argues, can only work if the staff are part of a strong social network which is concerned with the integration of difference (Bernstein 1996:25).

Institutions like these will have **integrated type** curricula. In these, there is weaker classification: "the various contents do not go their separate ways, but (....) stand in an open relation to each other" (1975: 87-88). However, according to Bernstein, using the theories of one course subject in another does not count as integration; "[i]ntegration, as it is used here, refers minimally to the *subordination* of previously insulated course subjects *or* courses to some *relational* idea, which blurs the boundaries between the subjects" (1975:93 emphases in the original).

Integrated type curricula can be either teacher-based (in which case the integration occurs within a block of time used by one teacher) or teachers-based, in which case the integration occurs across the units taught by different teachers. Teachers-based integration requires what Bernstein describes as certain conditions for success, which can also be regarded as potential areas for conflict or disorder: first, there must be consensus about the integrating idea; second, the integrating idea must be very explicit; third, the link between the integrating idea and the knowledge to be taught must itself be coherently spelled out; fourth, there is the need for committees or institutional spaces which enable the staff, as well as the students, to negotiate forms of interaction; and finally, there is the need for, but also the potential for problems in relation to the multiplicity of criteria and forms of assessment (Bernstein 1975: 106-109).

4.2 Visible and invisible pedagogies

I will now discuss some more specialised modalities of framing. For Bernstein, the two fundamental, generic modalities of pedagogic relation or framing are visible or conservative pedagogies, and invisible or progressive pedagogies. **Visible** pedagogies place strong emphasis on students' capacity to perform according to relatively explicit criteria; "a visible pedagogy", Bernstein suggests, "puts the emphasis on the external product of the child" (1990:70). In contrast, **invisible** pedagogies place greater emphasis on "procedures internal to the acquirer (cognitive, linguistic, affective, motivational) as a consequence of which a text is created and experienced" (1990:71). In the case of invisible pedagogies, only the educator is (at least initially) familiar with the logic of the pedagogic practice. This feature, along with the tendency to make the educand the protagonist of the pedagogic process, means that, at least initially, the pedagogy will be "invisible" to the educand.

Bernstein further characterises the difference between visible and invisible pedagogy in terms of differences in hierarchical, sequencing, and criterial rules. **Hierarchical** rules determine the process of learning how to be a "transmitter" and an "acquirer" in a pedagogic relation, as well as the boundaries of these two roles. **Sequencing** rules determine, as the name suggests, the progression of units to be taught and learned. These rules imply another set: **pacing** rules, or the rules that govern the pace at which any given sequence is taught. Finally, **criterial** rules determine the criteria which the acquirer is expected to appropriate and apply to her/his own practice, and that of others (Bernstein 1990:65-66).

Visible pedagogies operate on the basis of relatively *explicit* hierarchical, sequencing, and criterial rules, while invisible pedagogies operate on the basis of relatively *implicit* hierarchical, sequencing, and criterial rules. From the perspective of the educand, this means that the rules of visible pedagogies are relatively accessible to her/him, while they remain hidden or unknown (at least initially) if the pedagogy is invisible. Both pedagogic types reproduce middle class values, albeit, different middle class values: visible pedagogies reflect the values of the so-called "old" middle class and a social structure which is conducive to strongly classified social *types*. In contrast, invisible pedagogies reflect the values of the so-called new middle class, and of a society whose social structure is conducive to the formation of well differentiated individuals[12]. Both pedagogies are bound to be *exclusive* of working class students. However, Bernstein

suggests that the class "bias"[13] is likely to be worsened by invisible pedagogies, whose invisibility makes it more difficult for those who do not share the class culture to acquire their rules of recognition and realisation.

4.3 Market-oriented and autonomous pedagogies

I now wish to introduce categories for the analysis of the discursive orientation of education to work. Here Bernstein offers two categories and descriptions which will be useful to my thesis: market-oriented and autonomous pedagogies.

The **market-oriented** modality is advocated by practitioners who assume that the primary function of the educational process is to prepare educands to acquire positions within a given field of production. Education, from the point of view of this modality, serves to prepare educands to enter specific primary contexts or fields of production. The educator cannot, and should not shirk what is viewed as the most important ethical obligation: to provide the educand knowledge that improves her/his chances of obtaining employment. For this reason, this modality privileges the transmission of discourses necessary to enter the market.

In contrast, the advocates of the **autonomous** assume that knowledge has an intrinsic value. Indeed, the advocates of the autonomous modality assume that what is important is to preserve educational spaces which are insulated from the demands of the market-place. The validity of knowledge is constructed, if not in opposition, in an effort to maintain the autonomy of pedagogic communication with respect to the marketplace. The rationale is that truly critical thinking can only occur in pedagogic spaces which are not determined by the market-place. This modality thus makes a virtue out of the strong classification between education and the field or fields of production.

Bernstein critiques *both* modalities. He notes that *both* are relays for the stratification of knowledge, that *both* are conducive to social inequality. The two modalities differ not in that one is ideological and the other isn't, but in the way in which each produces ideological relations. The autonomous modality, Bernstein suggests,

> is both a sacred and a profane form, depending essentially upon one's position as either transmitter or acquirer. From an acquirer's point of view an autonomous visible pedagogy is instrumental to class placement through symbolic means. Yet it has the cover of the sacred (1990:86).

Using Bourdieu's (1986) terms, we can say that the autonomous modality works by increasing the symbolic capital-- that is the accumulated prestige-- of those who already have enough symbolic capital to enter a particular field of production. This process is nevertheless dissimulated by means of appeals to the modality's 'sacred' quest for autonomy. As Bernstein says, the arrogance of the autonomous modality

> lies in its claim to moral high ground and to the superiority of its culture, its indifference to its own stratification consequences, its conceit in its lack of relation to anything other than itself, its self-referential abstracted autonomy (1990:87).

The market-oriented modality would appear to avoid these problems by providing the acquirer with the knowledge to overcome social inequality. As Bernstein notes, "vocationalism appears to offer the lower working class a legitimation of their own pedagogic interests in a manual-based curriculum, and in so doing appears to include them as significant pedagogic subjects" (1990:87). However, at the same time it closes off educands' own personal and occupational possibilities by recreating within the field of reproduction, the hierarchy of the economy, its forms of classification and framing, and thereby its barriers.

5. Bernstein's theory in the context of higher education

Having provided an overview of Bernstein's theory, I now wish to evaluate the extent to which it is applicable to the field of education which I will be investigating: higher education. Bernstein attempts to develop a theory of pedagogic communication that is capable of explaining any form of pedagogic practice, in any culture, on any level. These claims would appear to be validated by the work of many researchers in different levels of education, and in many countries[14]. In this section, I nevertheless wish to propose some changes and additions to Bernstein's theory that take into account some features of pedagogic communication which are specific to higher education in the U.K., and which are not adequately explained by Bernstein's theory.

5.1 The role of the recontextualizing field

I will begin with Bernstein's characterisation of the recontextualizing field. The reader will recall that this field is the one that regulates the movements of texts and discourses between the primary and the secondary contexts. According to Bernstein, it is constituted by official regulating entities of the state and local educational authorities; and the various fields (higher education specialised in education; specialised media of education; and any other) which exert an influence on the process of recontextualization (1990: 191-192). Bernstein is particularly interested in analysing the mediating role played by this field, its institutions and agents.

Although this analysis may be crucial in primary and secondary education, I will argue that in the context of higher education in the U.K., the recontextualizing field, especially in its form as an official pedagogic field (official agencies of regulation) has considerably less power than is the case of earlier levels of education. It is true that in the U.K., the power of the Higher Education Founding Council (HEFCE) has increased dramatically in the last years, and with it, the power of the advocates of certain forms of pedagogic practice (cf. my discussion of "quality control" in Appendix I). It is also true that there would appear to be a new managerial class in higher education, that has an increasingly centralizing, and perhaps even homogenising effect in higher education, one that is not entirely unlike that of a state curriculum (witness the extraordinary, and near simultaneous transformation of higher education degrees into modularised schemes). Even so, there is as yet nothing comparable in the university to a centrally determined curriculum.

Moreover, until recently, teaching in higher education has not been based on anything like a systematic and explicit theory of instruction, taught to lecturers in the recontextualizing field. Despite recent attempts to professionalise teaching in higher education, it would seem that theories of instruction remain relatively implicit, and are the result of educational traditions more than professionalising training. It would appear in this sense that modalities of pedagogic practice are still determined by the transmission "by example" of pedagogic traditions within disciplinary and interdisciplinary fields. The nature of this process is a matter of considerable interest, which to my knowledge has not yet been the object of systematic, empirical research.

I would thus argue that in higher education, the pedagogic practices of disciplinary (e.g. physics, sociology, psychology and so forth) and in some

cases interdisciplinary fields (e.g. media studies, engineering, environmental studies, and so forth), along with specific organisational practices (university 'rules and regulations') have the role in higher education that state and other formal recontextualizing agencies have in earlier levels of education. For the purposes of this thesis, it thus seems less than useful to analyse the mediating role of recontextualizing fields, as Bernstein defines these. I will be more concerned with analysing the process of recontextualization as it takes place between the primary context (the field(s) of production) and the secondary context (the field of reproduction). This with reference to the recontextualizing fields *constituted by specific pedagogic traditions in higher education*, particularly, what I have described as the combined modality of higher education courses in media studies.

5.2 Para-curricular markers

Bernstein offers no account of the process whereby a variety of types of pedagogic text describe, specify, and at times even transform the workings of the curriculum. Here I have in mind the various texts-- course handbooks, course descriptions, and so forth-- which higher educational institutions produce to accompany the curriculum 'itself'. This thesis will analyse such texts, which I will refer to as **para-curricular markers**[15].

The fundamental function of these texts is as *framing* devices. If the curriculum is fundamentally a device of classification, then para-curricular markers are fundamentally devices for the framing of the knowledge classified by the curriculum. They specify rules for both the transmission and the acquisition of knowledge within the overall framework provided by the curriculum. From the perspective of transmission, they serve to control the appropriation by each lecturer of her/his subject area. Given the greater autonomy of the lecturer vis-a-vis the teacher in primary and secondary education, a mechanism is required which is capable of regulating that autonomy. I propose that this is a key function of para-curricular markers like the course handbook, and the syllabus, which makes public the discourse to be taught by the lecturer. Of course, the extent to which such a control is effective depends on the efficacy of the institutional hierarchy, and the extent to which the para-curricular markers are an accurate representation of what is happening in the classroom.

Along with this function of control (in the most negative sense of the term), the para-curricular markers are also a framing device inasmuch as the specify the inter-relation between the various categories being taught and learned. Para-curricular markers tend to explain what the nature of the relationships between categories is. In so doing, they provide a valuable insight -- even if never a 'transparent' insight-- to the logic of recontextualization that governs any particular curriculum.

Perhaps the most obvious function of para-curricular markers is to control the acquisition of the curriculum, and its specific units, by educands. From the perspective of acquisition, para-curricular markers are framing devices which attempt to control the students' reception of the curriculum and its individual units. They specify what forms of appropriation are legitimate, and which forms of appropriation are illegitimate. As part of this process, they attempt to promote certain forms of subjectivity with respect to course. This by specifying rules of 'good practice' in the different levels of pedagogic practice that are addressed by the markers.

5.3 Pedagogic genres

Bernstein's concepts of classification, framing, and code make it possible to describe different modalities of pedagogic practice. However, Bernstein's theory lacks a theory of pedagogic genres. Although I would propose that this theory is important in any pedagogic context, it is particularly important in the context being analysed in this thesis. The pedagogic practice which I will analyse occurs in curricular units which are structured on the basis of very specific modalities of framing: lectures, seminars, and workshops. To be sure, the texts required of students must also conform to certain modalities of framing. Though useful in a general way, Bernstein's concept of framing lacks the conceptual specialisation required to describe such modalities. In this section, I will thus develop an account of the category of **pedagogic genre**.

Although the concept of genre is not one which Bernstein employs, I would contend that in this instance, as in the case of para-curricular markers, it is possible to "locate" the phenomenon within Bernstein's framework. Pedagogic genres are strategies of inter-relation which operate on the level of the framing of pedagogic texts and contexts[16]. Pedagogic genres are forms which serve to coordinate the expectations of both educators and educands with respect to the form and content of the

pedagogic text to be transmitted and acquired. In this sense, they articulate rules of hierarchy, sequencing, pacing and criteria with rules of recognition and realisation. In this thesis I will distinguish between curricular genres (for example, the lecture, the seminar, and the workshop) and genres of evaluation (the essay, the unseen test, and so forth).

The primary (but by no means the exclusive) function of **curricular genres** is as modalizations of hierarchical rules (cf. section 4.2 above). For example, in the case of lectures, the hierarchical rule explicitly favours the lecturer inasmuch as the lecturer speaks, and students listen. In contrast, in seminars it is the students who are expected to be the protagonists in pedagogic communication. In this sense, it is possible to argue provisionally that lectures tend to be structured on the basis of a more visible pedagogy, and seminars, on the basis of a more invisible pedagogy. Although it might be assumed on the basis of this characterisation that the seminars are the more democratic genre, this constitutes a naive interpretation of the seminar. In the seminar genre, the lecturer must establish control by other means, which I will describe in detail in later chapters.

The primary (though not the exclusive) function of **genres of evaluation** is to provide criterial rules (cf. section 4.2 above) for the purposes of examination. The labels of "unseen test", "2000-word essay", or "multiple-choice questions" all provide signals as to what form of realisation of the pedagogic text is desired. Once again, it is possible to characterise each different genre in terms of the extent of the visibility of its pedagogy. For example, a test requiring students to solve a mathematical equation tends to be structured on the basis of, and indeed forms a part of a more visible pedagogy than does an extended essay in which students are asked to discuss a philosophical concept in the light of their personal experiences.

In both curricular and evaluative genres, it is important to note that the category of genre is designed to overcome the traditional reduction of genre to so and so many textual types. More than textual types, genres provide a horizon of pedagogic expectation which becomes manifest in textual types, but which involves the entire process of pedagogic interaction. It is also important to note that genres, like the modalities of framing and the rules of recognition and realisation which they articulate, tend to produce and reproduce pedagogic relations which are structured by unequal distributions of cultural capital. Both educators and educands must learn how to communicate by means of pedagogic genres; but not all educators or educands can acquire the rules involved with equal ease. Moreover, although certain pedagogic genres may become 'universal' to a

given educational field, there are likely to be important variations from context to context.

6. Conclusions

To conclude this chapter, I will return to the notion of pedagogic communication in order to explain how Bernstein's theory enables us to understand it in a new way. Thereafter, I will explain how I propose to use Bernstein's theory to analyse pedagogic communication in the context of the BA (Hons) in Science, Communication, and Culture.

Earlier in this chapter, I explained that the process of pedagogic communication has tended to be treated as an unproblematic relay of knowledge and of social relations. Bernstein's theory makes it possible to characterise pedagogic communication in a more complex manner. Pedagogic communication involves a process of discursive recontextualization, whereby educators select, classify, and frame meanings for the purposes of acquisition by educands. This process is governed in the first instance by pedagogic discourses, whose logic is determined by the transformational grammar, which Bernstein articulates in terms of the different levels of the pedagogic device. As the term "transformational grammar" implies, the process transforms the meanings of the discourses that are recontextualized from primary fields. Both embedded in, and determining the process, are particular codes, that is particular modalities of classification and framing, which establish relations of power within, and the mechanisms for the control of, pedagogic communication.

Codes and pedagogic discourse determine not just the form of the knowledge to be taught, but the positioning of pedagogic subjects in relation to that knowledge. In this sense, codes and pedagogic discourse produce symbolic rulers of consciousness, which create, position, and oppose pedagogic subjects. The category of symbolic ruler of consciousness, along with the entire conceptualisation of the process of acquisition, are what make the theory of pedagogic communication a theory of *communication*, and not just a theory of the production of pedagogic texts. Pedagogic communication entails *both* the aspect of the construction of pedagogic texts (or "relations within") and the reception of pedagogic texts (or "relations to" pedagogic texts).

Both of these levels are mediated by pedagogic codes and discourses. But as Bernstein suggests on several occasions, there is no automatic

continuity between the levels of construction and reception. What is taught is not necessarily what is learned. The extent to which the learner acquires a pedagogic text depends on the extent to which s/he acquires the necessary rules of recognition, and the rules of realisation. Whether or not this happens depends in turn on the dominant symbolic ruler of consciousness: this ruler may create opposing pedagogic subjects, or subjects for whom it is not possible to recognise particular pedagogic contexts, let alone communicate in ways that are appropriate to those contexts.

Here, what Bernstein refers to as "local practice"-- peer relations, family, gender, class, 'race' and other relations-- play a crucial mediating role in the reception of pedagogic discourse. However, and in contrast to scholars who adopt a relativist and depoliticising orientation towards the question of reception, Bernstein is careful to link both pedagogic innovations and oppositional forms to existing codes, and discourses: innovation and opposition are themselves always transformations of existing codes and discourses. Indeed, Bernstein suggests that codes, discourses, and the symbolic rulers of consciousness which they produce contain within them the kernels for their own transformation. Systems of classification operate on the basis of boundaries, and boundaries constitute "gaps" between categories which are susceptible to transformation. This potential for transformation may be primed by contradictions and dilemmas that operate both between and within categories, between and within pedagogic subjects.

I will now explain how I will use Bernstein's theory to analyse pedagogic communication in the BA (Hons) in Science, Culture, and Communication. The BA (Hons) in Science, Culture and Communication, and therein, the Communicating Science module, can be regarded as instances of pedagogic discourse. Both levels (the degree as a whole, and the module) recontextualize discourses produced in a variety of fields of production: the scientific, the humanities, and media production, to mention just three. And both levels transform these discourses into something other than they are in the primary context. A first research question for this thesis is thus, what discourses from the primary context are recontextualized by what pedagogic discourse(s), and what effect does this have on the recontextualized discourses?

The process of recontextualization produced by the course and by the module is realised in particular modalities of pedagogic practice. On this level, the research question is, how are the recontextualized discourses transformed into particular modalities of pedagogic practice, and what is

the nature of these modalities of pedagogic practice?

The entire process has a positioning effect. The pedagogic discourse produces, reproduces, or perhaps even contests a particular distributive order, a certain symbolic ruler of consciousness. Here the research questions are, what symbolic ruler of consciousness, and whose symbolic ruler of consciousness is produced, reproduced, or contested by the course and by the module (the two levels may produce different symbolic rulers of consciousness)?

Last, but certainly not least, I have explained that what is taught is not necessarily what is learned. Here the question is, how do the students, regarded as empirical subjects, relate to the pedagogic discourse, and to the symbolic ruler of consciousness which this discourse produces, reproduces or contests? Again, this question will be answered in relation to both the level of the SCC course as a whole, and the Communicating Science module in particular.

To my knowledge, questions like these have not been investigated in relation to the teaching and learning of media studies, media production, and science communication in higher education. I hope to demonstrate in the following chapters that they nevertheless constitute an extremely powerful way of explaining, indeed *reinterpreting* the whole problematic which is sometimes naively conceived as no more than a 'divorce' between media 'theory' and 'practice'. The problem, if there is a problem, is not that there is simply a 'gap' (in the innocent of this term) between 'media theory and practice'. The problem lies instead in the manner of the recontextualization of discourses, some of which are misleadingly classified as 'theory', others of which are misleadingly classified as 'practice', and both of which are recontextualized with implications which tend to be 'invisible' to many practitioners.

Notes

[1] More recently, Hodge and Kress (1988) have used the term to identify their own methodology of semiotic analysis.

[2] The justification for this methodological option has its roots in Weber's (1968) suggestion that actions are first and foremost, meaningful. A number of philosophers of language have argued that actions can thus be, indeed *must* be "read" in order to be understood. P. Ricoeur (1981) presents one of the few systematic accounts of the nature and benefits of the textual analogy in social research. For a critical account of the use of the textual analogy by Ricoeur, see "Action, ideology, and the text" in Thompson (1984), pp. 173-204. For a critical account of different analogies in social research, see "Blurred genres: the refiguration of social thought" in Geertz (1983), pp. 19-35.

[3] See Thompson (1990) for a discussion of different conceptualisations of ideology.

[4] For examples of these conceptualisations, see Nöth (1990).

[5] This definition, as Bernstein himself suggests, is not unlike the one given by Bourdieu (1975; 1986) for the concept of habitus, though as developed by Bernstein, it is more specialised.

[6] Although Bernstein is concerned with the absence of a specialised account of educational communication, it is interesting to note that other scholars have noted a similar absence with respect to theories of mass communication. The tendency has been to take the concept and theory of communication itself for granted, even by theorists who were ostensibly providing accounts of the very process. For an effort to address this problem in the domain of media studies, see Thompson (1990).

[7] See for example, Benveniste (1971); Chatman (1978); and Stubbs (1983).

[8] See for example, A. J. Greimas (1983).

[9] The concept of realisation is widely used by Halliday (1978) and indeed by Bernstein himself. It is treated as a category of production, i.e. concretizing another category, for example from discourse to text and vice-versa. It is nevertheless worth noting that the use of the notion of realisation may itself take for granted a process which can and needs to be theorised in detail. This is, in effect, what Bernstein's theory of the pedagogic device does. Bernstein theorises the realisation of pedagogic texts.

[10] Here it is important to note that, although the notion of pedagogic discourse has the effect of specialising the theory of discourse, Bernstein suggests in a number of brief references that pedagogic discourse is produced or reproduced in a variety of institutions, and not just in the educational. He speaks, for example, of the development of a pedagogic relation between a doctor and her/his patient, whereby the patient learns to explain his/her symptoms using a language which is appropriate to the relation.

[11] The fact that Bernstein develops these categories both before and after he develops his theory of the pedagogic device poses some problems for the analyst. There is not always a discernible continuity, or inter-relation between the different levels of his theory. For this reason, I will employ especially Bernstein's most recent work (especially Bernstein 1996, and "Social class and pedagogic practice" in Bernstein (1990) pp. 63-93). However, where necessary I will also refer to the much earlier "Class and pedagogies: visible and invisible" in Bernstein (1975) pp. 116-139.

[12] This distinction is one that in Bernstein's earlier work is described in terms of "mechanical" and "organic" forms of solidarity, respectively. For reasons of space and scope, I will not describe these aspects of Bernstein's theory. For a detailed characterisation of them, see Atkinson (1985).

[13] Bernstein makes quite frequent use of the concept of "bias". In my view, this term, like many others that Bernstein uses (relay, transmission, and so forth) constitutes a certain regression to positivism, insofar as it suggests implicitly that something can be "unbiased", that is, value-, or discourse-free. I take the view that this is not possible. For this reason, I will always use quotation marks when using this term.

[14] See Bernstein's account of research using his theory in Bernstein 1996.

[15] My formulation of "para-curricular markers" has been influenced by G. Bettetini's (1984) concept of the extra-textual marker; and by R. Hodge and G. Kress's (1988) concept of "logonomic system".

[16] My formulation of pedagogic genres has been influenced by J. Martín-Barbero's (1993) characterisation of media genres.

Chapter 2

The Construction of Pedagogic Discourse in the SCC Curriculum

Introduction

In this chapter, I will analyse the structuring of pedagogic discourse on the level of the Science, Culture and Communication (SCC) course curriculum. I regard this level of an analysis as a prelude to an analysis of the recontextualization of media studies in the "Communicating Science" module. To the extent that relations within the Communicating Science module are at least partially determined by the broader curricular structure, then it is necessary to begin with an analysis of the curricular process.

I will structure this level of analysis as follows. In section one, I will link the degree's formation to particular discourses both within, and beyond the University. This section will also provide a first description of the SCC curriculum. In section two, I will analyse the pedagogic code that structured the curriculum and its institutional context. In section three, I will analyse the framing of science and humanities discourses, with special reference to the hierarchical relation which the course established between the two categories. In section four, I will continue with my analysis of framing, but this time from the perspective of the visibility of pedagogic practice within the different curricular strands. In section five I will analyse the question of the orientation of the SCC course towards the market-place.

It is important to reiterate that the function of this chapter is designed to provide a context for a more detailed explanation of pedagogic communication in the Communicating Science module. For this reason, but also for reasons to do with the scope and resources available for this thesis, I will not attempt to engage in a detailed analysis of pedagogic discourse in *each* of the curricular units taught in the wider SCC degree. Instead, I will examine the forms of classification and framing produced, reproduced, or contested by the structuring of the curriculum,and by its para-curricular markers.

1. A brief history of the SCC degree

Before describing the course itself, it is necessary to describe and analyse aspects of the discursive context which led to its formation. This context was a complex one. Indeed a historical analysis of the process which led up to the formation of the new BA (Hons) in Science, Communication, and Culture would require a separate investigation. In this thesis, I merely want to describe and analyse what, in my view, were some of the central discursive 'sources' for the degree's structure.

1.1 C.P. Snow and the "Two Cultures"

The first, and perhaps most fundamental of these sources can be located in the debates which took place in the 1960's with respect to the extremely specialised nature of science education in the U.K. Perhaps more than in any other industrialised nation, the U.K.'s secondary and higher educational system was premised on a radical insulation of science and humanities subjects. This educational specialisation, and its social effects became the focus of debate in the late 1950's and early 1960's, when C. P. Snow, a literary author with scientific training, delivered a lecture (the Rede Lecture, at Cambridge University) which critiqued what Snow described as a "gulf of mutual misunderstanding" between scientists and the literary elite. The lecture was published in book form (cf. Snow 1963), and the book became the subject of a debate about the "Two Cultures": according to Snow, the gulf between scientists and "non-scientists" was so wide, as to produce two different "cultures". Snow used the term "culture" (as in "Two Cultures") in an explicitly anthropological manner. "The scientific culture", he wrote, "really is a culture... in an anthropological sense. That is, its members need not, and of course often do not, always completely understand each other... but there are common attitudes, common standards and patterns of behaviour, common approaches and assumptions" (1963:9). (Significantly, Snow later recognised that it might be more accurate to speak of two "subcultures".)

According to Snow, the cultural divide was sustained by the literary illiteracy of scientists, and by the scientific illiteracy of "non-scientists". Most scientists, Snow said, did not understand Dickens. And the "total incomprehension" by non-scientists of even the "most elementary" scientific concepts gave "an unscientific flavour to the whole of the 'traditional' culture, and that unscientific flavour is often, much more than

we admit, on the point of turning anti-scientific" (1963:11). Yet "[i]t is the traditional culture, to an extent remarkably little diminished by the emergence of the scientific one, which manages the western world" (1963:11).

As far as Snow was concerned, the "Two Cultures" phenomenon was problematic for the following reasons. First, there was no place where the "Two Cultures" could meet, and this diminished the "creative chances" for both cultures:

> "The clashing point of two subjects, two disciplines, two cultures-- of two galaxies, as far as that goes-- ought to produce creative chances. In the history of mental activity that has been where some of the breakthroughs came. The chances are there now. But they are there, as it were, in a vacuum, because those in the two cultures can't talk to each other" (1963:16).

Second, the arts intellectuals were "natural luddites", who not only ignored the meaning and significance of even the most basic scientific concepts, but considered it to be in poor taste to be reminded this. Last, and occupying much of Snow's lecture, there was the question of postwar industrial development. Snow was concerned with the implications of the "Two Cultures" divide for the U.K.'s future scientific, and technological development.

What was the cause of cultural divide? Although the divide existed all over the western world, Snow blamed "our fanatical belief in educational specialisation" and somewhat mysteriously, "our tendency to let our social forms crystallise." "This tendency", wrote Snow, "....means that once anything like a cultural divide gets established, all the social forces operate to make it not less rigid, but more so" (1963:17). The only "way out of all this... [was] of course, by rethinking our education" (1963:18).

If I have quoted Snow at some length, it is because the SCC is deeply indebted to the discourses reproduced in the Rede Lecture. In effect, the designers of the SCC course set out to do just what Snow recommended: to rethink science education, in this particular case, science teaching in higher education. And they did so for very much the reasons put forward by Snow: to overcome the mutual incomprehension, and to foster a greater scientific literacy amongst all sectors of the U.K. as part of a greater national, democratic project. Moreover, the course designers' fundamental strategy was to do this by juxtaposing scientific and "arts" discourses. This in the hopes that this would cause a shower of [creative] sparks like the one envisaged by Snow.

The problem with Snow's diagnostic and recommendations-- and by extension with the the fundamental SCC diagnostic and strategy-- was that even as it recognised a significant dynamic, it failed to interpret it in a manner which showed its social and political origin. Snow rightly recognised a strong boundary between the reproduction of scientific and humanities discourses. In the terms of this thesis, the "Two Cultures" phenomenon involved a strong classification of science and humanities discourses on *both* the level of the field of reproduction, and the field of production. Such a strong classification on both levels might seem to be a 'natural', and automatic consequence of the distributive rules of advanced capitalism, but the U.S. experiences showed otherwise. In the U.S., unlike Great Britain, students in high school and in higher education were, more often than not, required to acquire some knowledge of both sets of disciplines.

If such strong classification on the level of reproduction was not an automatic consequence of strong classification on the level of production, why such strong insulation in the U.K.? This is the fundamental question which Snow could only answer by means of a peculiarly depoliticising metaphor: the tendency for social divisions to 'crystallise' in the U.K.. This metaphor obscured, indeed naturalised a historical process whereby a *single* social process led not so much to the formation of two cultures, but to the insulation of two (or more) discourses.

What social process led to this form of classification, and who would stand to gain from this process? For reasons of space and the scope of this thesis, I cannot engage in a detailed analysis of the history of the classification and framing of science and other discourses in the fields of production, and reproduction in the U.K. To my knowledge, this is a process which has been bemoaned, but which has not been researched in a rigorous manner. The following is one hypothesis: to the extent that the modern industrialised nation state, and with it technocracy, were the result of an aperture of the dominant social classes to scientific (or quasi-scientific discourses); and to the extent that technocracy was a prerequisite for economic development in Western European nations, then certainly the most progressive sectors of capitalist societies would not stand to gain from a very strong insulation of scientific discourses, at least in the field of reproduction. Who, then, would stand to gain? Perhaps, and again, as a matter of hypothesis, a landed aristocracy would. For this aristocracy, it seems conceivable that scientific discourses, and eventually technocracy itself, would pose a threat to a social order based on a relatively rigid class system, and on hereditary privileges. For such an aristocracy, and for the

class of civil servants at least partially shaped by the aristocracy's interests, scientific discourses would be a matter to be contained, not to be spread. To the extent that in the U.K., such an aristocracy dominated the culture until well into the twentieth century, then one hypothesis is that the dynamic described by Snow would benefit the landed aristocracy.[1]

Whatever the historical root of the phenomenon, Snow failed to understand that there was, in Bernstein's terms, a single symbolic ruler of consciousness which worked not only to strongly classify the various fields, but also to oppose subjects by means of mechanisms of **distinction**. Here I refer to Bourdieu's concept, which explains how subjects adopt certain positions, certain attitudes which consciously or unconsciously work to increase the gap between oneself, and what is deemed to be common, or even vulgar. This in order to increase one's social standing and prestige (in Bourdieu's terms, to increase symbolic capital) (Bourdieu 1986). It would appear from Snow's discourse that many scientists regarded the scientific "illiteracy" of "literary intellectuals" as a matter of sacrilege, and vice-versa: that many literary intellectuals regarded the scientist's apparent lack of taste as a symptom of their lack of sensibility to cultured culture. In short, each discourse characterised the other as the profane[2].

To be sure, Snow's descriptions must be treated with extreme caution. A key aspect of the dynamic of distinction was to simplify, and caricature the nature of the other. Snow raised an important point, albeit for the wrong reasons, when he suggested that the number 2 (as in "Two Cultures") was a "dangerous" one. The 'danger' lay not in the revolutionary potential of the dialectic (as Snow significantly suggested) but in the simplifying nature of the dualism. The oppositioning tendency of the dualism made it possible to overlook the common culture of the two groups. As I explained earlier, both discourses were premised on at least some common cultural features: language, nationalism, class, and so forth. Moreover, the dualism almost certainly homogenised both scientific and "non-scientific" discourses by transforming them into single entities: science, and "arts", "scientific" and "literary" "types".

But even as it simplified and homogenised the constituents of both sets of categories, it is extremely significant that in Snow's work all non-scientific fields and discourses were accorded the status of a single *negative* entity: "non-scientific", "lay" or or even "traditional culture". I have already noted that Snow considered it to be remarkable that the U.K. was still "dominated" by the "traditional" culture. In addition, and with the notable exception of the "Two Cultures" metaphor itself, Snow's metaphors were

metaphors drawn from natural science: the coming together of two galaxies in showers of sparks, the crystallisation of social structures, and many others. This suggests not only that Snow's understanding of the social dynamics was coached in the language of natural science, but that his discourse worked to create a new relation of framing in which the science categories were the dominant. I will show in later sections the extent to which this framing was reproduced by the structuring of the SCC curriculum.

1.2 The "Public Understanding of Science" movement

The "Two Cultures" discourse was one of several discursive 'sources' for the SCC course. Another important discourse was the one produced by the movement known as the Public Understanding of Science (PUS) in the U.K. The movements 'manifesto' is found in the Bodmer report on *The Public Understanding of Science,* which was published by the Royal Society in 1985.

The report was ostensibly the result of an investigation by an ad hoc committee set up by the Royal Society to study the state of the "public understanding of science" in the U.K. However, it is clear from the first pages that the report was more of a proclamation of the importance of science, than a critical investigation. As the vice-president of the Royal Society explained in the preface, the report

> ...deals with an issue that is important not only, or even mainly, for the scientific community but also for the nation as a whole and for each individual within it. More than ever, people need some understanding of science, whether they are involved in decision-making at a national or local level, in managing industrial companies, in skilled or semi-skilled employment, in voting as private citizens or in making a wide range of personal decisions. In publishing this report the Council [the Council of the Royal Society] hopes that it will highlight this need for an overall awareness of the nature of science and, more particularly, of the way that science and technology pervade modern life... (Royal Society 1985:5).

The report can be regarded as having a relation of continuity with the "Two Cultures" discourse inasmuch as it regretted an alleged lack of scientific literacy in the "general public" in the U.K., and emphasised the need to provide all citizens with such a literacy; inasmuch as it linked this

literacy to the broader question of industrial development; and more fundamentally, inasmuch as it continued to promote the weakening of the classification of science in ways which depoliticised the problematic even as (on another level) they re-politicised it by advocating a privileged space and position for science.

But along with these continuities, there are also some important discontinuities. The Bodmer report was written in the context of severe cutbacks in State funding for natural science institutions. These cutbacks, which occurred during the first part of the Thatcher regime, were one of the factors that may have contributed to what was widely perceived as an accelerated process of decline in the national and international influence of British scientific institutions. The institutions of natural science, headed by the Royal Society, appear to have attempted to reverse this process by engaging in a public relations campaign that signalled the importance of science to national development. This time, however, there was a shift in the strategy of legitimisation. The Bodmer report called not just for an increase in scientific literacy and for increased funding for science education, but for scientists' greater participation in -- and simultaneously a closer analysis of-- the mass media's representation of science. In effect, the Royal Society was discovering the possibilities of, but also the dilemmas created by the process which one sociologist has described as the **mediazation** of modern culture (J. B. Thompson 1990): the mediation of more and more aspects of everyday life by mass media institutions. Indeed, a substantial part of the report was concerned with the question of the relations between scientific institutions, and the mass media. Even as it critiqued aspects of media representation, the report recognised the importance of of the media in the task of increasing the so-called public understanding of science. Indeed, it even chastened scientists for not taking enough interest in public relations. In what was subsequently to become its most quoted passage, the report said "... our most direct and urgent message must be to the scientists themselves: Learn to communicate with the public, be willing to do so and consider it your duty to do so" (1985:36).

One of the byproducts of the Bodmer report was that a small group of scientists set out to investigate and promote the so-called public understanding of science[3]. The first aim was, from the outset, determined by the second. Investigations by Durant (1989) and others were all structured in ways that assumed that the research ought to support the discourse of the Royal Society. In this context, it is unsurprising that the

research revealed that "the public" was indeed scientifically illiterate, and was in urgent need of a proper scientific education.

This movement and discourse constituted an important antecedent for the SCC course in at least two ways: first, it created a context in which the communication of science became the object of investigation, and thereby began to acquire legitimacy as a field worthy of academic study. Without such a legitimation, many aspects of the SCC course would be inconceivable. But at the same time, the legitimation depended on the conflation of research into the so-called "Public Understanding of Society", with the development of communication strategies which promoted science for its own sake. In effect, the PUS discourse sought to reconstitute science as a 'sacred' category. This attempt to legitimate science by means of the mass media also created a context in which a number of universities began to train their scientists in the skills of mass communication. In the case of the SCC course, this discourse was taken up in by the course planners in ways which spanned a continuum of regulative orientations. At one end of the continuum, there were those who assumed that the new course ought to teach students to legitimate science; at the other, there were those who assumed that the course ought to subvert the ideological relations promoted by the PUS.

1.3 Media and cultural studies in the UK

As I will explain in more detail below, the SCC course was developed jointly by the Faculties of Science and Humanities. However, within the Faculty of Humanities, one school had a particularly important role: the School of Media Studies. This was the School which I was eventually employed by, and in which the "Communicating Science" module was based. And this was the School which contributed historicising, and ideologically critical discourses to the degree. More specifically, it contributed the discourses of the growing body of researchers in the U.K. and other countries, who critiqued positivist accounts of science, positivist accounts of science communication, and indeed the representation of science in the media[4]. Where the critique of positivist conceptions of science was concerned, researchers working in the field of cultural studies contributed a discourse which both historicise scientific discourse as an instance of cultural practice; and politicised by relating it to the interests of particular institutions, and to the domination of particular social groups. For example,

the feminist critique of the systematic domination of women by scientific institutions, researched by Merchant (1980) and others. Where the critique of positivist accounts of science communication was concerned, cultural and media studies offered critiques of what was regarded as a text-book example of the homogenising, and elitist discourse about "the public"[5] which had been critiqued by Raymond Williams (1983) and others. Indeed, from the perspective of the advocates of this critical discourse, the PUS movement as a whole demanded an urgent, and sharp critique. It was hoped that such a critique would create conditions for a more democratic form of study which could reveal the richness, complexity, and ideological dangers of the process known as the popularisation of science.

Of particular interest was the question of the status of the "popular" in "popular science", and in the popular *reception* of science. From the perspective of cultural studies, neither of these could or should be reduced, as the Royal Society (1985) was doing, to a matter of "public ignorance" or deficit theories of science education.

This stance marked a radical departure from positivist approaches to science, and science communication which were implicitly or explicitly proposed by the advocates of the PUS movement. But it also marked a shift in focus vis-a-vis the older "Philosophy of Science", "Sociology of Science", or "History of Science" approaches commonly found in courses in Science Studies. Media and cultural studies pushed to the forefront of consideration the question of the socio-cultural relations between science, communication, and culture. Hitherto, critical academic interest had centred on the epistemological status of science as discourse.

Finally, and as I will explain in more detail in later sections and chapters, the radicality of the critique proposed by media and cultural studies was also in marked contrast to the regulative orientation of many of the scientists teaching on the degree. Whereas the latter assumed that the degree ought to legitimate science, members of the School of Media Studies like myself assumed that the instead, the degree ought to teach students to recognise science as a discourse, and to question modes of science communication based on the uncritical legitimation of scientific discourse. It is however worth noting at this point that differences in regulative orientation which I am describing were not, and indeed at the time of writing this thesis were still not recognised by most practitioners teaching on the course.

1.4 The shift from singular, to regionalised discourses

The formation of the SCC course must also be linked to the circulation of economic capital in higher education in the U.K. This dynamic provided a decisive incentive for the development of the degree at a time when there was considerable resistance to it on the part of certain sectors of the University.

Two faculties developed the new degree: the Faculty of Sciences, and the Faculty of Humanities. The single most important motivation for both faculties to develop the new degree was the concern over the predicted shortage of students applying for 'traditional' degrees: traditional science degrees (biology, chemistry, and so forth) but also 'traditional' humanities degrees (literary studies, and especially history). It was predicted that universities across the U.K. would have more and more difficulties recruiting students for these degrees in the 1990's, and in this context, the new SCC degree was seen by many in the University as a strategy for economic survival.

This strategy and the process which it was meant to address can be linked to a broader social process which Bernstein describes as the **regionalization of knowledge**: a "region" is created by the recontextualization of discursive "singulars" (1996: 23). According to Bernstein, this process has the effect of weakening classification of the singulars (indeed it can only happen if the classification of the singulars is weakened). When this process occurs, it is a matter of some interest to understand the new principles of recontextualization which construct the new discourses, as well as the ideological "bias" that underlies the new principles. "New power relations", Bernstein says, "develop between regions and singulars as they compete for resources and influence" (1996:23-24).

This description, I would argue, is an especially apt one to describe the formation of the new degree in the University. The regionalization of knowledge led to the creation of a new educational "market", which the University sought to exploit. At the same time, this very process led to a power struggle which at one point almost scuppered the degree before it had even taken in its first cohort of students. The degree's designers faced vehement opposition from some administrators and lecturers who could not conceive of a degree that was not *either* for scientists *or* for non-scientists, that was not to be owned *either* by the Faculty of Sciences, *or* by the Faculty of Humanities. In effect, the regionalization constituted, in the eyes of those who defended the existing order, a profanation of 'sacred' categories.

The battle lines were thus drawn between those who wanted something closer to a traditional either/or education (the dominant pedagogic device and symbolic ruler of consciousness), and those who were motivated to regionalise: the Faculty heads, for whom the procurement of more students was paramount; but also some of the founding practitioners-- especially those in the science faculty-- for whom the development of a new, regionalised category was also the key to personal, and professional development. The confrontation was so strong, that even a sympathetic cross-faculty committee initially charged with designing the new degree was unable to reach an agreement as to the final form of the new degree.

The 'impasse' was resolved when the two heads of the two faculties agreed that two individuals, one from each faculty, should design the basic curricular structure of the degree. On the part of the Faculty of Sciences, the key member was a physicist. On the part of the Faculty of Humanities, the key member was a member of the School of Media Studies. The central motivation for the physicist was a professional one: the development of a regionalised space (which he conceived in terms of "interdisciplinarity") in which he could develop a new discourse and with it, a new career. The central motivation for the member of the School of Media Studies was an economic one: faced with what was at the time a relatively low level of recruitment for the "mainstream" Media Studies degree, the new SCC degree appeared as a way of securing the future of the School. Together, these two practitioners designed the new degree, and in so doing drew up new boundaries between the two faculties.

As I explained above, with the development of regionalised categories, there tend to be shifts in relations of power. The question I want to answer now is, *was* there a shift in power with the rise of the new degree?

Prior to the formation of the SCC degree, the teaching of science at the University conformed quite closely to the rules of the pedagogic device which I introduced in section one, above. Although the university had begun to modularise, there were virtually no links, academic or other, between the Faculty of Science, and the Faculty of Humanities. The relation between the two faculties was governed by a collection code: the University taught science, and it taught humanities, but there was an extremely strong classification, that is insulation of, the two categories and their respective sub-categories. The two faculties were autonomous in the administrative sense, and exchanged virtually no courses. There was little or no academic or social interaction between staff of the two faculties. In accordance with the collection model introduced in chapter one, professional identities and

relations were tied to each category, that is, to each faculty.

Of the two faculties, the Science faculty was by far the more powerful one. It was, in fact, the most powerful faculty within the university: it recruited the most students, had the biggest campus, and commanded the greatest resources. Moreover, most of its staff members shared the central university administration's technical discourse[6] and regulative orientation.

Exactly the opposite was true of the Faculty of Humanities. This Faculty had the fewest students, the smallest teaching facilities, and commanded the least resources amongst faculties making up the University. Although there were significant differences in the regulative orientation of its staff members, the Faculty as a whole was an exception within the University to the extent that it valued autonomous modalities of pedagogic practice.

In this context, it may seem surprising that the figure used by administrators to describe the relation between the two faculties in the new degree was that of "partnership". The idea of the partnership suggests that the two faculties worked together to design and develop the degree, and to actually teach the degree. Although there was a process of shared development, from the start one of the two "partners"-- the Faculty of Sciences-- had a privileged status within the degree.

This status was produced by the following modality of framing: first, the Faculties agreed that 60% of the curriculum should be devoted to the teaching of science. This was ostensibly motivated by the need to obtain the higher State funding for science courses. Administrators in the Science Faculty argued that State regulations required this percentage as a minimum for courses which obtained the substantially higher level of funding accorded to science degrees. Year later, it emerged that the requirement was in fact only one of 50%. However, at the time the 60% statistic was accepted by all sides, and was used to justify the following aspects of the relation.

Second, and following on from the first point, the Faculties agreed to split the funding itself on a 60/40 basis: 60% for Faculty of Science, and 40% for the Faculty of Humanities. It is worth noting that, despite the lower level of funding for the Faculty of Humanities, this funding was considerably higher than the Fee Band One funding which applied to the History and Literary Studies degrees. Indeed, it was also higher than the Fee Band Two funding which applied to the School of Media Studies' BA (Hons) in Media Studies. From this perspective, the Faculty of Humanities

stood to gain much from this modality of framing, and this is undoubtedly how its administrators understood the relation.

Third, and ostensibly following on from the previous two points, both faculties agreed that the Science Faculty should deliver 60% of the curriculum, and the Humanities Faculty, 40%. Both faculties also agreed that the Award Leader (course leader) should be a member of the Science Faculty, and that the Humanities Faculty should provide the Deputy Award Leader. As part of this, it was agreed that the Award Leader and the Deputy Award Leader should each be responsible for their respective faculty's contribution (Science, and Humanities, respectively).

This modality of framing was agreed on the basis of what was, ostensibly, a purely economic argument: to the extent that the course could be described as a "science course"; to the extent that this meant a higher level of funding; and to the extent that the 60/40 relation still meant higher funding for the Humanities teaching, the Humanities faculty agreed to the framing modality which I have described. In fact, this argument dissimulated a relation of domination which was based as much on the relative weakness of the Humanities Faculty within the technically-oriented University, as on a discursive consensus which had at its root an instrumental conception of science communication: practitioners in *both* faculties seemed to accept that, since the course was about science, and *science* communication, then it was fair that the *science* faculty should receive a bigger share of the economic capital. I will argue throughout this thesis that the manner in which this discourse shaped the pedagogic text acted to maintain the very form of classification which the degree was ostensibly trying to contest.

1.5 The first SCC curriculum[7]

The SCC course took in its first cohort of students in 1992. Its manifest mission was to "integrate" the "Two Cultures" described by Snow as being separated by a gulf of mutual incomprehension. In this section, I will explain in some detail how this was meant to happen. In later sections, I will analyse the extent to which it *did* happen (though already it should be clear that the acceptance of the "Two Cultures" discourse and diagnostic constituted the acceptance of the very discourse which was allegedly being contested).

Admissions. I will describe the actual SCC admissions requirements

in chapter four. Here, I merely wish to note that a key aspect of the dominant pedagogic device was the segregation of students into different domains of specialisation. This process began in secondary school, where students were encouraged to specialise in science or arts A-levels. It was then confirmed in higher education, were degrees recruited on the basis of a strong classification of students as being either science students, or "arts" students. In order to contradict the "Two Cultures" dynamic, a key aspect of the SCC strategy was to recruit students who were not specialised in either one of the fields of reproduction (science or arts). The course was to attempt to recruit students who preferably had a background in both scientific, and humanities disciplines.

Given the tendency towards specialisation, and indeed, given the relatively strong *internal* classification especially of the natural science disciplines, the course practitioners assumed that the degree would need to be structured in a manner which would be inclusive of the different disciplines of natural science. Put negatively, the course was to be structured in a manner that would not exclude any particular background. This ambitious objective was to be achieved by making all forms of science accessible to all students, regardless of their academic background.

The SCC curriculum. Doing so required the development of an entirely new curriculum, which I will now describe in some detail. I will begin with the aims of the degree. Although I have already begun to describe these in a general way, it is instructive to describe the formal aims and objectives in more detail. These were to

- promote a reflexive understanding of scientific theory and practice with a view to increasing students' scientific literacy;
- develop students' understanding of the (potentially problematic) inter-relationship of scientific and cultural knowledge;
- develop students' capacity to analyse issues from both a scientific, and socio-cultural perspective;
- enable students to communicate scientific ideas to both academic communities and to the "wider public";
- and finally, to develop amongst students "both a practical and a critical understanding of how science is represented and disseminated in contemporary society" (p. 6, SCC Essential Papers, Appendix III).

The above is only a summary of the aims. The reader may wish to consult

the full list of aims and objectives described in the section on aims and objectives in the "Essential Papers" (the student handbook, contained in Appendix III. The Essential Papers constituted the main para-curricular marker which was given each year to students and staff alike. They described the aims and objectives of the degree, and also contained descriptions of each module, as well as assessment rules, and other information which controlled the realisation of the curriculum by staff and students alike.)

The mentioned aims were realised by means of a 3-year bachelor of arts. This BA (Hons) was structured as follows:

1. *Terms.* Each year was divided into into three terms: Autumn, Spring, and Summer. The Autumn and Spring terms lasted eleven weeks, including a single reading week in each one. Although the Summer term also had a duration of eleven weeks, only five of these were devoted to actual teaching (the rest were devoted to final projects and examinations).

2. *Modules.* Each year, students took six curricular units or modules[8], each of which accumulated 20 credits (One year = 120 credits). (This credit scheme was the one employed by the Faculty of Science, and not by the Faculty of Humanities, which taught only four 30-credit modules per year). Each 20-credit module had a duration of one year. Moreover, each 20-credit module had at least one hour-long lecture, and one hour-long seminar. However, in some cases modules with different configurations (e.g. modules with media production, or science laboratories) increased contact time to four hours per week per module.

3. *Strands.* The three years of study were structured by three strands[9]. There was first, and centrally, the **Discovery of Science in a Cultural Context** (DSCC) strand. This strand was constituted by three successive, year-long, double-weighted modules (DSCC1, DSCC2, and DSCC3). Each year, the modules in this strand covered the development of science during a particular historical period. DSCC1 covered the 16th and 17th century; DSCC2 the 18th and 19th century; and DSCC3, the 20th century (the reader may wish to refer to the Essential Papers [Appendix III], which describe the periodization in greater detail). Lecturers from the different

disciplines of science (Faculty of Science), but also from the Schools of Media Studies, Literary Studies and History (Faculty of Humanities) were to come together to provide what the different para-curricular markers described as an "interdisciplinary" approach to the history of science. Indeed, course documentation defined **interdisciplinarity** as "a special and explicit relationship between different disciplines in at least two respects. First, the disciplines come together to focus their attention on commonly agreed areas of study. Second, in certain circumstances this common focus results in the emergence of a new cohesive approach embracing Science, Communication, and Culture" (p. 7, Essential Papers, Appendix III). An aspect of the DSCC modules were biannual "conferences", which were meant to create within the curriculum, the genre of academic conferences, but with the students as the participants and producers of knowledge. They were also designed to provide what practitioners described as a "handshake" space for the two separate "tracks" of this module: the Science track, and the Cultural track (I will describe these tracks in some detail, below).

The second strand was the **Science strand**, which was itself divided into two different strands or themes: a science strand, and a strand about contemporary scientific *issues*. The Science strand taught about the natural sciences, and basic skills in scientific analysis. However, it was designed to do so in a fashion which was itself "interdisciplinary". Its modules were designed to break down traditional boundaries between biology, physics and chemistry. This strand was constituted by the Computing, Numerical and Graphical Methods (CNGM) module, which taught students basic maths and computer skills; and the first and second year Matter, Physical and Life Processes (MPLP) modules, which provided introductions to physics, biology and chemistry. The "Issues" sub-strand, constituted by the first-year Science in Contemporary Issues and second-year Scientific Analysis of Environmental Issues, taught students to engage in the analysis of so-called science-based issues (e.g. skin cancer, environmental issues such as global warming, and several others).

The third and last strand in the course was the **Science Communication strand**. This strand included three modules: the first-year Communicating Science module, which was designed to

provide an introduction to media and cultural studies, as well as a media production "skills base" in science communication; the second-year Reception of Science module, which taught students about media and cultural studies approaches to reception research, as applied to public understandings of science; and finally, the second-year Science Journalism module, which was taught as a combined course in print journalism[10].

4. *Exceptions.* I explained earlier that each year was constituted by six modules, each of which had a credit weighting of 20 credits. There were two significant exceptions to this rule. First, the DSCC modules were double weighted: they thus contributed 40 credits each, and had twice the number of contact hours, at two hours of lectures, and two hours of seminars per week. In principle, though not in practice (I will say why below), this reduced the number of modules taken by students in the first and second years from six, to five. Another exception to the rule was the third year, which included a double weighted DSCC (DSCC3) module *and* a double-weighted dissertation or "independent project" module. The third year was also unique in that, aside from taking DSCC3 and writing their dissertations, students were allowed to choose one humanities, and one science *option.* This constituted a significant departure from the rest of the curriculum, where students were not given any choice in what modules they could take.

Assessment. Each module was assessed separately, and a wide range of modalities of assessment were recognised within the degree. For reasons of space, I cannot describe all modalities of assessment, in detail. The reader interested in doing so may wish to turn to the section on assessment in the Essential Papers (Appendix III). At this point, I will merely highlight some key aspects of assessment practice in the degree.

1. *Formative/Summative distinction:* the University classified assessment as being either formative, or summative. As described by the degree, formative assessment "denotes the work a student normally does before the end of the third term of each year as s/he is coming to grips with the course material", while summative assessment is work normally required towards the end of each year, "when the student is expected to have mastered the course material"

(p. 10, Essential Papers, Appendix III). Each module contained a mixture of formative and summative assessments; as a rule, the balance of these two forms was 50% formative, 50% summative.

2. All assessment was marked according to the following system: the work must achieve a minimum of 40% in order to receive a passing mark. Thereafter, the following scale applied: 40-49% was the equivalent of a third class mark; 50-59% was the equivalent of a lower second class mark; 60-69% was the equivalent of an upper second class mark; and 70% or above was the equivalent of a first class mark. The Essential Papers (Appendix III) do not describe the criteria for what constitutes, in general, a third, second, or first class mark.

3. Each student's grade point average was computed on the basis of second- and third-year marks. At the end of the third year, the lowest mark for the two years was automatically dropped in order to assist especially (but not exclusively) those students who had an outstanding average, with the exception of one or two low marks. The first year marks, though awarded to students, were not computed as part of the grade point average. This was a university policy which was meant to ease the transition into the college system of marking.

4. In order to pass the degree, students had to obtain passing marks in all their modules. In addition, they must successfully complete an independent project or dissertation. This form of assessment received individual tuition from a project supervisor, and could be either an essay between 8,000-10,000 words, or an audio-visual production which was accompanied by a written explanation of its context, aims, and structure. The dissertation was also marked according to the marking system outlined above.

A variety of forms of assessment were used across, and within modules. However, it was generally the case that assessment in modules taught by Science lecturers took the form of seen or unseen tests; and that assessments in modules taught by humanities lecturers took the form of essays. I shall analyse the significance of this tendency in the sections that follow.

2. SCC as collection code

I will begin my analysis of the curriculum with an investigation of the extent to which the SCC course replaced the collection code which was a feature of the dominant pedagogic device, with an integrated code. This particularly where the relation between the science and humanities categories are concerned. I am interested in doing so because the course literature suggests (indirectly) that this was the case; and because it would constitute a significant contradiction of the dominant pedagogic dynamic where science education is concerned.

At first glance, the SCC course did indeed appear to interrupt the segregating dynamic generated by the dominant pedagogic device. The SCC course taught *both* science and the humanities, was staffed by lecturers from *both* the faculties of science and arts, and was offered to students with a variety of backgrounds. Indeed, the course appeared to take this process one step further inasmuch as it appeared to develop an *integrated* and historicising approach to the relation between science, culture, and communication.

This is certainly what was suggested by the discourse of practitioners in day to day interactions. It was also suggested by the descriptions of the course provided by the the Essential Papers, the University prospectus and the course leaflet (cf. Appendixes III, V, and VII respectively) . In its own way, each of these texts explicitly suggested that the curriculum *was* an integrated one: what, using the terms introduced in this thesis, might be described as a teachers-based integration (cf. chapter one). Despite the fact that each of the curricular units had its own identity and *raison d'etre*, each unit appeared to be part of an integrated whole which had as its principle of integration, the development of what was described repeatedly as an *interdisciplinary* approach to the relationship between science, culture, and communication.

We would thus expect the SCC institutional context, and curriculum itself to be structured on the basis of an integrated code; that is, with weak classification of the different subjects or discourses taught, and strong communication between the subject practitioners (cf. chapter one). Indeed, especially in modules like DSCC, we would expect a new modality of interaction, whereby practitioners, from the perspective of their identity and discourse, would not be 'tied' to their (original) category of discourse.

But was this the case? An analysis of the forms of classification operating within the institutional context as a whole and in the curriculum

itself in the 1994/95 academic year (and indeed in the preceding years) suggests that it was not. The innovation in the degree lay not in interrupting the logic of dominant pedagogic device, but in *internalising* the boundaries of that device. Before the creation of SCC, the University had reproduced the dominant pedagogic device by creating entirely separate and distinct institutional and curricular contexts for the teaching of the natural sciences and of the humanities in higher education (i.e. separate departments, with separate courses). In SCC, these boundaries were reproduced *within* one single institutional context and *within* a single curriculum. The 'site' or level of classification of science and humanities changed, but not the classification itself.

What is the evidence for this claim? I will begin on the level of the SCC institutional context. Here, it is very significant that despite the institution of a joint management structure, each staff member remained administratively and hierarchically accountable to her/his "original" department. This meant that, at least from the perspective of managerial hierarchies, staff members remained tied to their categories. Although there was an SCC management committee which did exert some power over its members, each department and each school remained in control of its lecturers: it was up to each school to hire and manage its lecturers. To be sure, in most cases the lecturers teaching on SCC continued to do at least some teaching in other degrees which were produced entirely by one of the schools within each Faculty. Many lecturers did more teaching for the 'mainstream' degrees in their School (Biology, History, and so forth) than they did for SCC.

Whatever teaching lecturers *did* do in SCC tended to be organised along the lines of the following division of academic labour: the science was taught by members of the Science Faculty, according to their disciplinary specialisms; the social history of science was taught predominantly by members of the School of History, within the Humanities faculty; and the media studies/media production was taught predominantly by staff belonging to the School of Media Studies, again in the Faculty of Humanities. So it is clear that, in addition to a relatively strong classification of the categories of science and humanities, there was, in addition, a relatively strong classification of the *internal* values of classification along the lines of the different strands.

As we would expect, this form of insulation along department and disciplinary affiliation was accompanied by a very weak horizontal communication between the members of the different departments, and

indeed between schools within each department. Initially, this dynamic was contradicted by a bond between some members of the Science Faculty, myself, and one other Media Studies lecturer. But this more integrated inter-relation eventually broke down due to conflicts over the ownership of research projects related to the degree; managerial responsibility for the degree; and the supervision of a Ph.D student studying the relation between Science, Culture and Communication. Although there were psychological dynamics involved in each of these cases, all had their origin in conflicts over boundaries. Put differently, it is clear that the conflicts in subjectivity were of a discursive origin which could be linked to the collection code.

On the basis of the module descriptions provided by the course handbook, it might be assumed that the DSCC strand was an exception to this coding orientation. Indeed, the Essential Papers suggested that DSCC was the interdisciplinary "spine" of the degree, and thereby an instance of an integrated orientation or code in SCC. In fact, the modules within this strand further internalised the collection code, and with it, a strong insulation between categories. Each of the three DSCC modules was split into cultural and science "tracks". According to the Essential Papers,

> The **Science Track** (...) follows the historical development of science in terms of a sequence of [scientific] milestones, covering the disciplines of physics, chemistry and biology.
>
> The **Cultural Track** uses the opportunities of the historical sequence, to introduce questions about the nature of scientific knowledge, and how science is implicated in political and social thinking. The general aim will be to encourage exploration of forms of scientific knowledge and how it relates to historical, political, and social contexts (...). (p. 28, Essential Papers, Appendix III).

The splitting of the module into these two tracks reproduced *within* this strand (the DSCC strand), the form of boundary-making that I have noted thus far *between* strands. This insulation was sustained once again both by subject-matter, and by the division of academic labour: the science track, which was conceived along the lines of a scientist's history of science, was taught by the scientists; the cultural track, which was conceived as a space in which to use the "opportunities" created by the first track (I will return to the ambiguity of this formulation later in this chapter), was taught by lecturers from the Schools of History, and by one lecturer from the school of Media Studies who was himself a cultural historian.

So the science track of DSCC was taught and assessed exclusively

by science lecturers, and the cultural track, by humanities lecturers. Given the context which I have described, it is unsurprising that at least up to, and including the 1994/95 academic year, each of the "tracks" had for all practical purposes achieved the status of a separate module. It is worth noting that this was not just a result of successive pedagogic realisations, but of the pedagogic conception itself: course documentation shows that from the start, the tracks were conceived to be taught and assessed separately. It would appear, in this sense, that the course designers consciously or unconsciously built in a strong insulation between the two strands, despite the public emphasis on "interdisciplinarity" and "integration".

Highly schematic module outlines for many, but by no means all curricular units were distributed for the first time in 1996 (cf. Appendix IV). That is, four years after the course took in its first cohort of students. Before that, the only para-curricular marker that *was* in operation was the course handbook, or "Essential Papers" (cf. Appendix III). But this provided at best a very general summary of what was happening in each module. During the year in which this investigation took place (the 1994/95 academic year), it is accurate to say that most lecturers had at best a very hazy, and at worst a totally inaccurate understanding of what teaching was taking place outside of their strands. Some practitioners' justification for this was that most science faculty members did not produce syllabi for their students. However, with Bernstein it can be argued that this too, was a manifestation of the collection code, where the teaching of each category tends to be "closed shop".

Having provided evidence to justify my claim that the course continued to be structured by a collection code, I now wish to comment briefly on some of the effects of this "unrecognised" collection code. From the very first year of the course's operation onwards, there were frequently "lapses" in communication, and in the organisation of the degree. In chapter four, I will describe one of several crises that occurred with students in the course, partly as a result of the lack of integration of different parts of the degree. Faced with this crisis, key staff members in both faculties began to treat what I have described as a collection code as a "communications problem". This was of course, a naive interpretation of the dynamic. The insulation was sustained not only by the lack of a common institutional affiliation, but by a level of discursive specialisation which made it virtually impossible to communicate across discursive boundaries: most scientists had no more of an understanding of the Foucaultian conception of discourse

which I used in my teaching than I had of quantum mechanics. These discursive boundaries also operated *within* the general categories of science and humanities, and even *within* strands. For example, there were considerable differences in discursive orientation between lecturers in the School of Media Studies, and many lecturers in the School of History. I shall explain in chapter three that there were also considerable differences in orientation within the Science Communication strand.

This meant that there was no explicit consensus as to the precise aims, and integrating principle for the course. The reader may recall that this is one of the conditions which is required for an integrated curriculum. For this and all of the above reasons, I will argue that, despite most SCC practitioner's suggestions to the contrary, the SCC curriculum and institutional context were structured not by integration, but by dis-integration. In the terms of this thesis, not by an integration code, but by a *collection* code. This suggests that the degree continued to reproduce the same coding orientation which operated in the pedagogic device which I have argued the degree attempted to contest. The difference was that, whereas hitherto the coding orientation worked to maintain science and the humanities in entirely separate degrees, in SCC they worked to insulate science from humanities *within* the degree. This was what I meant when I said that the degree internalised the forms of boundary-making associated with the science/humanities pedagogic device.

3. Framing: science as culture?

The question I now want to address is, how exactly were the different discourses framed? My analysis thus far has emphasised the classification dimension of the collection code. The degree of insulation between categories. I now want to concentrate on the dimension of framing: how meanings are put together and made public within a context, and the nature of the social relations that go with them. Framing involves the dimension of pedagogic discourse, strictly speaking: the principle for embedding instructional discourse(s), in regulative discourse.What was the recontextualizing principle that brought together the different discourses, even as they were insulated?

The SCC course was structured by a pedagogic discourse which recontextualized a number of very different discourses:

- Discourses about the history and philosophy of science
- Discourses about the history of Europe
- Scientific discourses: e.g. physics, biology, and chemistry, and their application in particular fields like ecology, and health
- Media and cultural studies discourses, which themselves can be regarded as social scientific discourses
- Discourses of media production

How were these discourses recontextualized within the degree?

Course descriptions suggested that the different discourses were brought together on the basis an "interdisciplinary" approach to the study of science *as culture*. This suggested a double transformation vis-a-vis the dominant pedagogic device: first, a weakening in the classification of science and 'non-science'; but also, a change in the *framing* of science: the SCC course was to treat science not as a sacred category (as in positivism), but as a mundane category: science as a cultural discourse.

I have explained already that the classification was somewhat changed, but a strong insulation persisted between the categories. Is the same true of the *framing* of science, vis-a-vis other discourses?

My analysis suggests that here too, the envisioned shift did not occur. There *was* a certain weakening of the framing by virtue of the fact that science was taught along with other 'profane' discourses: history, and especially cultural and media studies (I will have more to say about the last two in the next chapter). But the recontextualization of scientific discourses with the discourses of history, cultural, and media studies operated in a manner which continued to treat science in a privileged manner: as an objective, that is a-political, and a-cultural discourse which was hierarchically superior to other discourses; and as a discourse which was constructed in *opposition* to other cultural discourses, and indeed to culture itself. In this sense, it was not science *as* culture, but science *or* culture. This modality of framing was produced and reproduced by the hierarchical division of labour within the degree, and by the (equally hierarchical) division of economic and cultural capital within the degree.

What is the evidence for this assertion?

I will begin with an analysis of the distribution of mechanisms of organisational control. I explained in an earlier section that the Science Faculty was, by common agreement, accorded certain privileges: the Science Faculty received 60% of the (State) funding; from the start, a member of the Science Faculty was the SCC award leader; and, ostensibly

to justify the higher State funding, 60% of the course was devoted to the teaching of science. In addition, the majority of lecturers on the course were provided by the Faculty of Science. Moreover, with the exception of the deputy award leadership, virtually all key administrative posts were taken by members of the Science faculty: control of dissertations, two of the three year tutorships, and admissions were all controlled by the Science Faculty. Indeed the dominant position of the Science Faculty was confirmed in the first course leaflet (cf. Appendix VII) which mistakenly identified the SCC degree as part of the Science Faculty, and not as a jointly owned degree.

In addition to this, it is worth noting that the award leader of the course set up an entirely new institutional entity, called the School of Interdisciplinary Sciences, to manage the contribution of the Science Faculty to the new degree. Although I have explained that the different schools retained *de facto* control of their staff and thereby of the teaching processes, from the official university perspective, all of the *modules* offered by SCC came under the aegis of the field of studies constituted by the new School of Interdisciplinary Sciences.

It is significant that no corresponding entity was set up in the Faculty of Humanities. In the absence of such a corresponding entity, the new School of Interdisciplinary Sciences came to formally and informally 'own' the degree, even though public statements by its members suggested that SCC was a partnership between the faculties of science and the humanities. It is interesting, in this sense that, faced with the dilemma of managing a category which was designed *not* to be classified as being either science or humanities, it was nevertheless the science faculty that, for legal purposes, achieved managerial control over the course. But in order to do so, it was necessary to develop a regionalised School which was not controlled by any of the *existing* entities within the Science faculty.

I now want to show how the framing of the different discourses in the course itself contributed to the dominant role of the Science Faculty. I will begin with an analysis of the actual *rationale* given for the course in the Essential papers, particularly in the section on aims and objectives (Appendix III). An analysis of these suggests that these aims and objectives were themselves structured on the basis of the collection code. The Essential Papers listed the different aims and objectives of the course without specifying a principle of inter-relationship between the various aims and objectives. The closest that the various documents came to specifying a principle of integration was the suggestion of a new

"interdisciplinary" approach. But although interdisciplinarity was described in general, the actual form of the interdisciplinarity was not actually described. It is one thing to say that there is an interdisciplinary approach and to define interdisciplinarity, and another, to actually specify the concrete form of the interdisciplinarity.

Moreover, it is significant that the aims and objectives of the course almost always referred to science and culture, scientific analysis and cultural analysis (cf. Essential Papers, Appendix III). The preposition *as* was almost never employed: it was always science *and* culture, scientific analysis *and* cultural analysis, and so forth. Here, the conjunction *and* (as in science *and* culture) actually signified *disjunction* : science or culture. It follows that, at least those who wrote the original course documentation (the founding members of the degree, again with a division of labour along the lines of Faculties: each Faculty wrote its 'own' modules) themselves conceived the degree along the lines of this disjunction. So the disjunction did not simply materialise in the realisation of the plan: it was already present in the "mentality", that is the symbolic ruler of consciousness that governed the drafting of the course plans, themselves.

The same can be said about the curriculum itself, which was driven by a similar orientation. I explained earlier that members of both faculties agreed that the economic argument justified a greater number of curricular units being devoted to teaching and learning the natural sciences. As I have already noted, the overall proportion was approximately 3:2, or 60% science teaching. (In this context, it is a matter of some interest that some students suggested that SCC was not a bachelor of arts, but in fact a bachelor of science "in disguise".) Viewed from this perspective-- one that only became fully apparent when a curricular restructuring began to be negotiated-- it is clear that in quantitative terms, there was a clear hierarchy between the sciences and the humanities, with science as the dominant category.

But what about the qualitative relation? As realised in the curriculum, the qualitative or logical relation between science and humanities subjects also established a clear hierarchy between the two domains. I explained earlier that the modules constituting the DSCC strand were divided into the science and the cultural "tracks". This classification was framed as follows: the cultural track was subordinated to the history taught in the science track, which was developed as a scientist's history of scientific concepts and theories. Indeed the cultural track was conceived as a space in which to use the "opportunities" created by the science track.

But such "opportunities" were themselves not conceived as ways to truly historicise the science. Instead, they were to show how science was "implicated" in social events and to show how science was "related" to historical, political, and social contexts (Essential Papers, p. 28, Appendix III). This discursive construction suggested first, that science was at one remove from those contexts, rather than being *constituted* by those contexts; and second, that science was the superior entity to the extent that it was its own insulated historical logic which determined the logic of the twin track *relationship*. We see then that in this context, the framing of the two discourses operated not just to maintain the disjunction, but to establish a clear hierarchy.

The actual realisation of this module corroborated this hierarchy, with science lecturers determining the sequencing and pacing of the twin track relationship. Even so, it is important to note that some of the staff members operating within the *Humanities* faculty themselves reproduced what can be described as a positivist, and empiricist epistemology by treating the history of Europe as a sequence of factual events, or in the discourse of one of the history lecturers, as a series of "signposts" of European history. So it was not only that the History of Europe was subordinated to a sequence of scientific discoveries; in addition, there was no systematically developed cultural history of Europe, which showed how events-- including the scientific-- were part of discursive procedures, logics, and politics. This reduced the teaching of European History either to an agglomeration of empirically conceived 'events' (from the perspective of the more empiricist lecturers) or in the best of cases, to highly tactical instances of social critique (in the case of the more progressive lecturers): that is, instances of critique which were contained by the sequence and discursive logic of recontextualization provided by the Science track of DSCC[11].

Here it is worth noting that the above logic was not actually the intended one by course planners. The discourse of cultural studies was originally meant to structure the humanities track of the DSCC strand, and not just the Science Communication strand. The Essential Papers (cf. Appendix III) suggested-- and this was echoed by senior Science and Humanities staff members during the three years that I taught in SCC-- that cultural studies constituted the basis for interdisciplinarity in the cultural strand of DSCC. This principle was inscribed in the Essential Papers, which suggested under the heading of "Progression" that

> On the humanities side, the students are introduced to a cultural studies approach in Year One by way of the "Communicating Science" module and this underpins the Humanities elements in the "Development of Science in a Cultural Context" [DSCC] year One module (p. 9, Essential Papers, Appendix III).

As part of this, original course documentation suggested that a significant aspect of the degree was the development of a discourse that was critical of gender relations in science institutions. This last discourse, like the more general discourse of cultural studies, was in fact almost entirely absent from DSCC, and from the rest of the SCC course. Indeed, the same positivist logic of framing operated in the Science strand in general, and in the *Issues* sub-strand. It might be thought that the Issues modules were themselves of an "interdisciplinary" nature. In fact, the very title of the first of these modules is eloquent: it is the science *in* the contemporary issues, and not the social issues or discourses embedded in the contemporary science. Unsurprisingly, most of the description of these modules in course documentation suggested that the primary concern was with matters relating to scientific methods:

> "A main thrust [sic] of the module will be to develop the students' evaluation and assessment skills with respect to the nature, reliability and the role of scientific evidence and their ability to communicate their findings (p. 34, Essential Papers, Appendix III).

This emphasis was at first glance, ameliorated by statements like the one that follows:

> However, no science based issue exists in isolation. Hence the appraisal of the wider implications will form an integral part of the module" (Ibid.).

However, it is significant that the authors of this description assumed that a contemporary issue could be "science-based": to do so was to construct the issue entirely in terms of a scientific discourse. Moreover, the entire cultural embeddedness of any 'issue'-- the metaphor is my own, and not the para-curricular marker's-- existed only by negative implication: the reader was left to guess what other 'implications' might exist to the extent that the description merely suggested that no science-based issue could exist "in isolation".

I have thus far described framing within the DSCC, and Science strands. What about the Science Communication strand? It is a matter of

considerable interest that a space *did* exist within the the course for a certain contradiction and even contestation of the framing logic which I have thus far described. This space was the one accorded to media and cultural studies within the degree (cf. chapter three). Media and cultural studies discourses treat science, and science communication as cultural representation. In the case of my own teaching in the Science Communication strand, I treated both science and science communication as forms of discourse, in the Foucaultian sense of the term. There could not, in this sense, be a more direct contradiction of the regulative orientation which I described earlier.

But I wish to argue that this oppositional relation to the rest of the strands in the course actually confirmed the regulative order of the SCC pedagogic discourse. The pedagogic discourse of SCC positioned and oppositioned the different subjects (both 'topics' and discursive subjects) according to the dualisms that are typical of positivism: science as a value-free enterprise, which produces factual statements about the world, vs. 'non-science' as an evaluative enterprise, which produces subjective, and thus less valid, statements about the world. This very logic of the framing (oppositional), along with the strong insulation between categories, probably acted to contain the subversive potential of media and cultural studies. I am arguing that the 'opposition' offered by my teaching of media and cultural studies may have actually *confirmed* the very dualism which the course was supposedly contesting. This by providing, along with the rest of the humanities teaching, the 'subjective element' which confirmed the 'greater objectivity' of science.

To be sure, I will argue in chapter three that the general structuring, and indeed my own teaching of media and cultural studies was itself driven by empiricist oppositions between 'theory' and 'practice'. This structuring of the science communication strand, as much as the overarching pedagogic discourse, acted to severely limit the subversive potential of the critical discourses of media and cultural studies.

4. Framing: on the visibility of pedagogic practice

Having described the relation of framing between the science and humanities categories, I will now describe in more detail another aspect of framing: the visibility of pedagogic practice.

The SCC project, as described by the course rationale, and most of

its aims and objectives, suggested a *relatively* invisible pedagogy. I say relatively invisible because the fact that the course was structured around the graded marking of students' performance meant that in a fundamental sense, the pedagogy was a visible one. However, at least some of the aims and objectives suggested that the emphasis was on developing a 'reflexive' and 'critical' disposition towards the relation between 'science, culture, and communication'. Not on acquiring the capacity to perform according to some explicit "external" yardstick, but instead, to acquire what was in effect, an entirely new "internal" *disposition* towards the relation of science, communication, and culture.

This was, at least, what the para-curricular texts suggested *in principle.* The question I wish to analyse in this section is, was this orientation actually sustained throughout the various aspects of the degree?

Once again, a closer analysis suggests that there was actually considerable variation across the degree where the visibility of pedagogic practice was concerned. Put succinctly, the science teaching tended to be based on more visible hierarchical, sequencing, and criterial rules; and the media and cultural studies, on less visible hierarchical, sequencing, and criterial rules, with the history teaching somewhere in between these two categories.

Indeed a closer examination of the descriptions of the science and DSCC strands and modules suggests a modality of pedagogic practice based on very explicit hierarchical, sequencing, and criterial rules. In the case of the Issues, MPLP, and CNGM modules, the pedagogic practice was oriented towards teaching and then testing for knowledge of discrete scientific principles, or discrete scientific competences. It is significant in this sense that virtually the only modules that had final examinations (in contrast to long essays, final projects, or audio-visual productions) were the Science strand modules. As developed by the Science strand lecturers, these required students to solve equations, or to define scientific concepts. As such, these final examinations were based on very explicit criteria of what counted as a legitimate text.

Moreover, as realised in the 1994/95 academic year, most science lecturers taught these modules with a strong framing of educator/educand roles. This can be attributed in part to the strong framing in natural science of what counts as scientific knowledge, and what counts as commonsense knowledge. But it was also the result of the fact that most science lecturers tended to "fill" the pedagogic space themselves. They treated seminars as

extensions of their lectures, with the lecturer doing most of the talking and thereby occupying the pedagogic space with their own presence and knowledge. (The student survey which I analyse in chapter four reveals student complaints about the fact that these seminars were run by science lecturers as *de facto* extensions of lectures, with the lecturer doing most of the talking.)

The Science track in the DSCC modules was also framed in ways that suggested a very visible pedagogy. The curricular sequencing of this track over the three years was based on the division of the strand, and of each module into historical periods. Each of the three curricular years was used to develop a *chronological progression* of scientific discoveries which began in Ancient Greece, moved to the 16th and 17th century, and ended in the 20th century.

The form of relation in the Cultural track was somewhat less explicit thanks to its tactical nature (seizing on the 'opportunities' opened up the by Science track), but can still be described in terms of a relatively visible pedagogy. With two notable exceptions constituted by the teaching by cultural historians, the tendency amongst historians was to teach not a cultural history of Europe, or to make problematic historiography per se, but rather to teach chronological stories about clearly demarcated social events "accompanying" this or that scientific discovery. In this sense, the approach was mostly an empiricist one, and one that was geared towards teaching what one lecturer described in a meeting as the "basic signposts" of European history. As this metaphor suggests, sequencing rules were thus relatively explicit, even if not as explicit as those of the Science track, or of the Science strand.

The same is true of the criterial rules. The use of the extended essay as the genre of evaluation in the Cultural track (in contrast to the Science track's use of a final examination) signals a lowering in the value of internal framing on the level of criterial rules. Although very explicit criteria can be drawn up for the writing of essays, it is impossible to frame 'right' and 'wrong' answers as strongly in an essay, as in a multiple choice test, or indeed in a test that asks students to solve a mathematical equation. Even so, it is possible to argue that when compared to assessment in media and cultural studies, assessment criteria in the Cultural track of DSCC were considerably more visible especially in the cases where history was taught on the basis of an empiricist approach. An empiricist historian can talk about the 'facts' of history, and can require students to represent those facts. This is something which can hardly happen in semiotic analyses

(media and cultural studies), where a more hermeneutic orientation makes the boundaries of what counts as a sign or a text an inescapably interpretive matter.

There was nevertheless a reduction in the visibility of framing vis-a-vis the pedagogic practice in the science aspects, and indeed a similar reduction in the visibility of framing was evident where the hierarchical rules were concerned. In conversations and in evaluations, students reported that overall, humanities seminars tended to be less dominated by lecturers, and provided a greater space for discussion of the things which students thought were important (cf. chapter four).

However, I would argue that the pedagogy remained relatively visible in both the Science strand, and the DSCC strand, especially when compared to the considerably less visible modality of pedagogic practice in the Science Communication strand in general, and the Communicating Science module in particular. I will describe in detail why the Communicating Science module was structured along the lines of a less visible pedagogy in chapter three. For now, it suffices to note that in the Communicating Science and Reception of Science modules, the emphasis was on transforming students' understanding of the process of science communication on the basis of a critical-hermeneutic discourse. This meant that the entire teaching approach was geared towards transforming 'internal' dispositions, rather than teaching students how to 'perform' according to highly explicit rules of realisation[12].

There was, then, considerable variation in the visibility of pedagogic relations within the SCC degree. This variation was linked to the discursive orientation that dominated any one 'sector' of the curriculum. The teaching based on more positivist regulative discourses tended to be structured by modalities of pedagogic practice which were based on more visible hierarchical, sequencing, and criterial rules; and the teaching based on discourses with a more critical, and hermeneutic regulative orientation tended to be based on relatively invisible hierarchical, sequencing, and criterial rules. In this sense, the visibility of pedagogic practice was itself a sign of the process of internalisation of the "Two Cultures" pedagogic device which I described earlier in this chapter. This to the extent that there were in effect, two different "cultures"-- in fact pedagogic regimes-- where the visibility of pedagogic practice was concerned in the degree.

The boundaries of these two different regimes were punctuated by the temporal and spatial semiotics of pedagogic practice of the degree as a whole. In 1994/95, and in all of the preceding years, the Science and

Humanities faculties were located in different campuses. The Faculty of Science was located in a campus with a modern, and utilitarian architecture, one which was frequently described by students and staff alike as being "alienating", "cold" and "factory-like". The Faculty of Humanities occupied a building which was once a Church of England theological college. Its 19th century stone buildings, its sunken lawn and leafy grounds were preferred by students, and were in almost caricaturesque contrast with the campus used by the Faculty of Science.

Each of the SCC modules was taught by the faculty that informally 'owned' it, and *in its own campus*. This meant that students had to travel to one campus to learn about science, and to another campus to learn about the humanities. The distance between the two campuses (a mile and a half of winding, heavily used and hilly roads), and the lack of regular public transport between the two, meant that the weekly schedule had to be structured to accommodate this problem.

This was done in a manner which reproduced the science/humanities dichotomy on the temporal dimension: each week was divided in half, and each half was devoted to the modules of each faculty. Students spent the first two days of the week learning about the science 'half' of the curriculum in one campus, and the last two days of the week, learning about the humanities 'half', in the other campus. To the geographical, we must thus add a temporal boundary: as developed in pedagogic practice, there were the times of learning about science in the Science faculty, and then the times of learning about the humanities in the Humanities faculty.

5. SCC: autonomous, or market-oriented?

In this section I will analyse the relationship between the primary and the secondary contexts from the perspective of Bernstein's distinction between autonomous, and market-oriented modalities of pedagogic practice. The question here is, which of these modalities structured the SCC curriculum?

There was considerable ambiguity about this issue in the course. From one perspective, the course was an instance of a typically liberal celebration of the value of knowledge for its own sake. I have explained that the Essential Papers suggested that the SCC course should enlighten students on the basis of an 'interdisciplinary' approach to the relation between science, communication, and culture. The development of such an approach for its own sake, can be regarded as clear evidence of an

'autonomous' orientation (cf. chapter one).

However, I have explained that the course also taught particular science 'skills' and communication 'skills', and in this sense also had visible, and even vocational aims. For example, the aims of the course suggested that it should

> (iv) (....) enable students to articulate the nature of scientific ideas both to the academic community and the wider public
>
> (v) (...) foster both a *practical* and a critical understanding of how science is represented and disseminated in contemporary society (emphasis added in this thesis)(p. 6, Essential Papers, Appendix III).

Moreover, the objectives suggested that the course should enable students to

> (v) (...) make scientific ideas and their social implications usefully and accurately available to non-specialist audiences
>
> (vi) (...) develop skills at representation (p. 6, Essential Papers, Appendix III).

This was the aspect that was emphasised in course publicity. For example, the SCC course leaflet (Appendix VII) began its description of the course by providing a catalogue of job opportunities in the science communication field which graduates of SCC could aspire to. Even so, this apparently market-led orientation was contradicted by the actual structure of the course. Just three out of 18 possible curricular units were filled by modules which taught about science communication, or actual communication skills (Communicating Science in Year One, and Science Journalism and the Reception of Science in Year Two).

I will argue in chapter three that this ambiguity is to some extent a general characteristic of all combined courses, inasmuch as they combine features traditionally associated with *both* autonomous and market-oriented forms of education. However, in the SCC course, it is a matter of considerable interest that there was *also* ambiguity and contradiction where the orientation to the science market was concerned. The founding members of the course did not foresee the possibility that students would enter science fields of production after completing the SCC course. Although students were taught to engage in basic laboratory activities, the course was not meant to recontextualize science discourses in a manner

that enabled students to acquire advanced or specialised scientific skills. Instead, the logic of recontextualization was ostensibly that of providing students with an "understanding" of science, such that they could communicate more accurately about it. In fact, science lecturers explained to me that their teaching of science in SCC was identical to the teaching in non-regionalized degrees, with one exception: the pacing. Students covered less ground in the SCC course, than did students in traditional science courses.

There was, then, considerable ambiguity where the question of the relation to work was concerned in the degree. From one perspective, the course was emphatically an 'autonomous' one; however, upon closer analysis, it is possible to detect several signs of a market orientation. Even so, the teaching was not actually structured in a manner which enabled students to acquire actual rules of realisation for either domain. Students did not emerge from the SCC course with the capacity to communicate 'professionally' about science. The same is true where the rules of realisation for scientific procedures and research are concerned.

6. Conclusions

In this concluding section, I summarise the main points made by this chapter. The main findings in this chapter are the following:

- Contrary to what might be expected from the para-curricular markers, and indeed from the views expressed by most SCC practitioners, the SCC course was not structured along the lines of an integrated code. Instead, the curriculum and the institutional context were structured by a collection code, with strong insulation between the science and humanities discourses, and between the discourses which were 'internal' to each of these categories. As is typical of the collection code, this modality of classification was accompanied by a very weak communication between the agents of the different discourses.

- Again contrary to what was suggested by the para-curricular markers, and indeed by the views expressed by most SCC practitioners, the logic of framing was not one which treated science *as* culture, and which established a social equivalence between science and humanities discourses. Instead, the modality of framing

attributed a hierarchically superior status to science categories (institutional and curricular); and operated to preserve science as a 'sacred', that is non-cultural category. This meant that the principle of recontextualized actually operated to sustain a positivist regulative discourse: a discourse which was structured by the dualisms which are characteristic of positivism: subject/object, fact/opinion, science/culture, scientist/non-scientist.

- I nevertheless noted that the pedagogic discourse did recontextualize a discourse which contradicted this orientation: the discourse of media and cultural studies. However, the 'minority' status of this discourse within the overall degree; the insulations created by the collection code; and the oppositional logic of framing operated to contain the subversive potential of this discourse. In the next chapter, I will also reveal that the recontextualization of this discourse *within* its own context also acted to undermine it.

- The degree of visibility of the pedagogic practice varied in direct relation to any given sectors' regulative discourse. The more positivist the regulative discourse, the more positivist the instructional discourse, that is, the framing from the perspective of hierarchical, sequencing, and criterial rules.

- Finally, the course exhibited considerable ambiguity towards the marketplace: overall, the course seemed to be structured on the basis of an autonomous modality; however, the teaching of certain skills meant that the course could be read as being market-oriented by both students and staff members. The reduced amount, and manner of the teaching of these 'skills' nonetheless meant that students acquired rules of recognition, but not of realisation of science, and media production discourses.

Notes

[1] This hypothesis undoubtedly simplifies what must have been a complex historical process, one which would have to be researched in great detail. Here empirical questions of some interest are who, how, and when, for what explicit and implicit reasons, led the British educational system along the path of extraordinarily strong classification and framing of scientific discourses. Such an investigation is beyond the scope of this thesis. In proposing the above hypothesis, my concern is primarily to re-politicise a process which Snow and many others after him have inadvertently depoliticised. I also wish to signal clearly that, regardless of the ultimate benefactors, the classification and framing of scientific and so-called "arts" discourses was part of a single process, which reflected, however complexly, the discourses and interests of a social group or groups. A group or groups for whom scientific discourses must have constituted for a time a profanity, a threat to be suppressed, rather than a potential source of economic and symbolic capital, to be released and distributed to all for the benefit of the few. Although the situation has changed to some extent at the end of the twentieth century, it remains true that the domain of scientific discourses remains one that is strongly classified and framed. The logic of scientific discovery and application in everyday life is based on the principle that science should lead to a greater availability of science-based products, that are relatively easy to use by all (although of course, this varies enormously from context to context). This process should not be confused with one that makes the scientific discourse *itself* more and more accessible to all sectors. In many ways, this aspect of scientific remains as strongly insulated as ever.

[2] Snow's *own* position can be regarded as a mechanism of distinction, vis-a-vis the mechanisms of distinction employed by both scientists and literary intellectuals to distinguish themselves from each other. Snow is distinguishing himself by asking others to stop trying to distinguish themselves.

[3] See for example the work of Durant (1989) and Evans & Durant (1989). In addition to this type of research, the movement, which received considerable financial backing from the Wellcome Trust, the public relations branch of the pharmaceutical giant, has organised many seminars and conferences on issues involving the relationship between science, culture, and communication. As part of this process, there has been an increase in the number of courses which offer training in science communication. With the backing of the Wellcome Trust, practitioners in these courses have recently organised into a loose association of teachers of science communication.

[4] For examples of work done in cultural studies with respect to scientific discourse, see the Radical Science Journal; Haraway (1990); Locke (1992); and Merchant (1980). For an example of critiques of instrumental conceptions of science communication, and indeed of popular science communication itself, see for example Gardner & Young (1981); Myers (1990); and Silverstone (1985, 1986).

[5] For critiques of this kind of discourse, see Williams (1983), and Ang (1990).

[6] As I explained in the introduction, the University was a 'new' university (an ex-polytechnic). Although I do not have the space to engage in a detailed analysis of this process, the University's efforts to develop partnerships with local industry; the balance of power amongst its faculties; and its managerial discourse all clearly indicated a technical orientation, in the sense of a grounding in forms of knowledge which were based on what Habermas (1972) has described as the technical knowledge-constitutive interest (cf. Appendix I)

[7] I speak of the 'first' SCC curriculum because this curriculum was changed in 1997.

[8] By the 1994/95 year, the University had begun a process of modularisation. However, this process was just beginning, and in the case of the SCC course, there was no exchange of modules with other degrees (only two modules, Communicating Science and Science Journalism, were offered to the Environmental Science degree). As I explained in an earlier footnote, I will nevertheless use the university term "module" so as to make it easier to distinguish between the level of curriculum ('course') and the level of a curricular unit ('module').

[9] Some lecturers teaching on the course preferred to speak of four strands; as I will explain shortly, what I call the Science strand is constituted by two sub-strands: the Science strand proper, and the Science Issues strand. Such a classification seems more coherent to the extent that it recognises the predominance of a scientific discourse in both sub-strands.

[10] I will explain below that in fact, this module was run as a full production course in science journalism for broadsheet newspapers.

[11] A significant exception to this began to occur in the 1995-96 year, when the first year DSCC cultural track began to be taught entirely by one lecturer, a cultural historian, from the School of Media Studies. This lecturer transformed the logic of the track relationship. Instead of teaching an 'opportunistic' history, pegged to the science track, he taught a history of science as representation. Significantly, this happened without consultation with the Science staff, who expressed surprise at the changes when they became aware of them. What is of interest is not so much the surprise itself, but the capacity of the boundaries to conceal even drastic transformations like these.

[12] I will also explain in chapter three that the Science Journalism module within the Science Communication strand eventually constituted an exception to this rule.

Chapter 3

The Construction of Pedagogic Discourse in the Communicating Science Module

Introduction

In this chapter, I will turn to the analysis of pedagogic discourse in one of the SCC degree's curricular units: the first-year Communicating Science module, which I taught from the 1993/1994 academic year, until 1997. This level of analysis constitutes the core of this thesis. As I explained in the introduction of the thesis, I am particularly interested in the question of the relation between the teaching of media studies, and the teaching of media production. The Communicating Science module was the only module in the SCC degree which taught both media studies, and media production. For this reason, but also because the scope of the object of analysis is considerably more focused, my analysis of the construction of pedagogic discourse in the Communicating Science module will have a greater degree of delicacy than the analysis developed in the previous chapter.

I will structure this chapter as follows: section one will provide a introductory description of the module, and of changes which I introduced to it in the 1994/95 year. Section two will historicise the module's pedagogic discourse by linking it to the combined modality of courses in media studies. Section three will analyse the classification of media studies and media production. Section four will analyse the logic of recontextualization of media studies, media production, and the inter-relation between these two categories. Section five will analyse framing from the perspective of the visibility of pedagogic practice in each of the (internal) curricular genres that constituted the module. Finally, section six will analyse the question of the orientation of the module to work: was the module 'autonomous', or market-oriented?

Most of my analysis will be concerned with the restructuring of the Communicating Science module in the 1994/95 academic year. The justification for this is that this was the year during which I introduced a series of changes which were designed to put an end to the 'schism' between media theory, and practice. The analysis developed in this chapter will reveal the extent to which this restructuring was successful, or was itself based on the dominant symbolic ruler of consciousness.

1. The Communicating Science module

In this first section, I will provide an introductory description of the features of the module, as it was structured up to, and including the 1994/95 academic year. The reader may at this point wish to turn to the outline of the course provided in Appendix X (Original description of the Communicating Science module) and to the more detailed description provided in Appendix XI (Communicating Science syllabus for the 1994/95 academic year).

1.1 The Science Communication strand

I will begin by describing the immediate curricular context of the Communicating Science module. This context was provided by the Science Communication strand of the SCC curriculum (cf. chapter two). This strand was constituted by three modules: the first-year Communicating Science module; and the second-year Science Journalism, and Reception of Science modules. The first-year module was designed to provide an introduction to both media studies and so-called basic skills in video production. The second-year Science Journalism module was designed, and realised along the lines of a full production module, devoted to written forms of science journalism. The Reception of Science module was designed to continue the work begun in Communicating Science. But this along the lines of a specific division of contents: the first-year Communicating Science module was designed to cover primarily (but not exclusively) the aspects of the production and construction of science communication, whereas the second-year Reception of Science module was designed to concentrate on the popular *reception* of mass media messages about science and/or nature.

It is a matter of some interest that modules to do with Science Communication occupied only three out of 18 possible curricular units. The title of the course, and indeed the manner in which the course was presented in the University brochures and publicity materials (cf. Appendixes V, VI, and VII) explicitly or implicitly suggested that this aspect constituted a far more important aspect of the course. Indeed, and as I will explain in chapter four, most students regarded the Science Communication strand as the core and as the *raison d'etre* of the SCC course.

It is also a matter of some interest that, from the perspective of media production, there was in fact no progression in this strand. Students took workshops in video production in Communicating Science, with no follow-up in the following years. The same happened with the second-year Science Journalism module. There was no first-year Science Journalism module, and no module about journalism followed the second-year Science Journalism module. Although the media studies element of Communicating Science module was meant to provide a critical foundation for the Science Journalism module, the Science Journalism module was taught by lecturers who were not familiar with media studies. Indeed, during the 1994/95 academic year, the Science Journalism module was run by its module leader (a cultural historian in the School of Media Studies with some experience of science journalism) not as a 'theory-practice' course, but as a 'straight' production course in broadsheet journalism. In this sense, there was no effort to actually 'integrate media (studies) theory and practice'. Instead, the pedagogic discourse was closer to that of a traditional journalism course. In particular, this lecturer sought to reproduce the regulative and instructional orientation of broadsheet science journalism (e.g. *The Guardian*). For reasons of space and scope, I will not be able to analyse the teaching and learning in this module in any detail. It suffices to note that this different structure and orientation confirms a point that I made in chapter two: there was strong insulation not just *between* strands in SCC, but also, *within* strands: for all practical purposes, there was no integration between the contents in the Communicating Science/Reception of Science modules, and those in the Science Journalism module.

1.2 The original structure of the Communicating Science module

According to the description of the module provided by the original course documentation (cf. Appendix X), the Communicating Science module was designed to fulfil the following aims:

1. To introduce students to the approaches, concepts and research relevant to considering how scientific knowledge and developments are communicated to non-scientists;

2. To examine a range of kinds of materials which embody such communication, and to develop in the students skills of analysis of such materials;

3. To consider the ways in which popular conceptions of 'nature' and

'science' are interwoven with conceptions of power, hierarchy, and gender;

4. To lay a foundation of skills so that the students are able themselves both to design and practice such communications and to critically evaluate their own attempts. (Original module description, Appendix X)

The 'relevant' approach was a combination of media studies and cultural studies. As implied by the indicative bibliography, relevant studies from the first field included Gardner & Young (1981), Corner (1990), and Silverstone (1985). Relevant studies from the second included Williams (1980) and Merchant (1980). However, and as I explained in the previous section, the emphasis in the Communicating Science module was very much on the *construction* of popular science: that is, the analysis of the internal features of popular science texts and discourses, and thereby, on the teaching of a media studies approach.

At the same time that the module provided an introduction to media studies (as applied to the analysis of science communication), it also provided a "foundation of skills" in video production (the meaning of "foundation" must be questioned to the extent that there was no follow-up in later years).

In order to accommodate this last aspect, the module was divided into three internal curricular genres:

- an hour-long **lecture**, which was run as a plenary session
- an hour-long **seminar**, for which students were divided into groups of between 12 and 16
- a video production **workshop**, which lasted two hours, and which was structured around groups of between four and seven students.

Whereas the lectures and seminars were devoted to providing the introduction to media studies, the workshops were devoted entirely to teaching students video production skills. As conceived by the founding lecturers, these two internal strands of the module were to come together towards the end of the second term, when seminars were to be devoted to planning the students' final video production. Course designers assumed that the final production would be structured in ways that reflected the critical analytical disposition taught by means of media studies.

In the original structure, the module assessed students by means of two formative, and one summative assessment (cf. chapter two): the

formative assessments included one textual analysis, worth 20% of the final mark; and one standard essay on some science communication topic, worth 30% of the final mark. The final assessment was a final group video production project worth 50% of the final mark. This model was imported from the School of Media Studies, which ran a very similar assessment regime in some of the modules of its BA (Hons) in Media Studies.

As I explained in chapter two, each School informally 'owned' the modules for which it provided staffing. The Communicating Science module was no exception to this rule. Even though it was formally 'owned' and administered by the Faculty of Science, it was staffed by the School of Media Studies. In keeping with practice in this School, the module was staffed along the lines of the following form of classification: a lecturer was the overall "module leader" or overall tutor, but taught only in lectures and seminars. Workshops were taught by instructors[1] working for the Audio-Visual Services of the Humanities Faculty[2]. Although instructors were officially expected to teach the workshop according to the indications provided by the module leader, until 1994/95, instructors in the Communicating Science module ran the workshops virtually autonomously. This was a result of a mixture of School tradition, and the failure to find, prior to my arrival, a lecturer who could teach both media studies and media production. Even so, and as I explained above, the lecturer was expected to guide students in the production of the final video production project, and indeed, it was also the lecturer's task to designate criteria for, and mark this final project.

1.3 Changes for the 1994/95 academic year

I arrived to the SCC course one year after the first cohort of students was taken in to the new course. For this reason, I did not participate in the design and initial implementation of the curriculum as a whole, and of the Communicating Science module. After one year of teaching according to the above scheme (1993-1994), it became apparent to me that the module was unworkable for a number of reasons. First, I was faced with what I then conceived as a theory-practice divide. It was apparent that there was a schism between the two aspects. But in addition, the split nature of the module had the effect of debilitating *both* the introduction to media studies, and the introduction to media production. Each aspect required sacrifices vis-a-vis the other. The course could not be run as a full introduction to media studies, but equally important, it could not be run as a full

introduction to media production.

Second, the expectation that I should provide students with guidance and supervision in the production of their final video production projects was unrealistic. This to the extent that I did not participate in any of the video production training until the time of the final production, which began towards the end of the second term. Even then, I only participated in the design of the final production, not in its realisation.

For this reason I modified the module structure as much as the existing curriculum, and various administrative constraints allowed me to in the 1994-1995 academic year. The main changes were as follows: first, I modified the assessment regime. I transformed the essay assessment into an assignment which required students to write a treatment for their final video production. The function of this assessment was to provide both the students and myself with an assignment that would structure the initial stages of the final video production. Although this treatment was to be written and marked individually, I required each production group to choose the treatment they liked best as the basis for their final production.

Second, I modified the function of the seminars. The seminars were originally designed as a space in which to discuss concepts/theories introduced in lectures. In 1994/95, I decided to use them to plan and then evaluate short electronic news gathering (ENG) type exercises *throughout the year,* and not just for the final production. The 1994/95 syllabus (Appendix XI) contains a detailed description of the structure of these exercises, and the structure of the seminar sessions devoted to their planning and analysis.

The new assessment, and the changes in the seminars were meant to increase my participation in the workshops; or, in the terminology of this thesis, to alter the classification of the boundaries between 'theory' and 'practice'. Whereas previously there had been a clear divide between 'theory' (lectures, seminars) and 'practice' (workshops), I hoped that the changes would serve to integrate the two. In addition, the changes constituted an effort to move away from the formalist exercises which the instructors had been structuring the workshops (I shall comment more on this in section 4.2, below). I hoped to change this approach-- and indeed the entire system of classification and framing-- by a) requiring students to do small ENG-type productions as the platform for learning about questions and problems in genre communication; and b) by using these exercises as preparation for a somewhat longer ENG-type final production, which would be marked at the end of the year (the exercises themselves were not

marked). Students in the previous year's module had complained about the discontinuity between exercises and the final production, and the change was meant to address this key issue. It was also meant to enable me to achieve some degree of participation and control over a process which I was meant to be responsible for.

2. "Communicating Science" and the combined modality

Having provided an introductory description of the module, I will now begin an analysis of its modalities of pedagogic practice. I will begin this analysis by historicising the general pedagogic approach in the module, which combined media studies and media production.

2.1 About the combined modality

In chapter two, I suggested that the School of Media Studies' participation in the degree was the result of an economic motive, but also, of an 'academic' motive: the PUS movement constituted a textbook example of the positivist, and elitist discourses about science and in particular about the alleged needs of "the public"[3] which scholars in media and cultural studies had critiqued for years, not least in the field of popular science communication[4]. From the perspective of these practitioners (and later, when I arrived, from my own perspective as well), the PUS movement both provided the opportunity for, and required, a response in the form of a sharp critique. This orientation was the one that, in principle at least, was to shape the contribution of the School of Media Studies within the SCC degree.

Of particular interest was the question of the status of the "popular" in "popular science", and in the popular *reception* of science. From the perspective of media and cultural studies, neither of these could or should be reduced, as the Royal Society (1985) was doing, to deficit theory of science communication ("public ignorance" with respect to science) or to an uncritical pedagogy of science communication (the alleged need to "inform" publics about science for social-economic purposes). The popularisation of science, and the popular reception of science were reinterpreted as a cultural process which both shaped and dominated aspects of cultural groups' everyday life.

As I began to explain in chapter two, this stance marked a radical

departure from positivist approaches to science, and science communication[5] which were implicitly or explicitly proposed by the agents of the PUS discourse. But it also marked a shift in focus vis-a-vis the older "Philosophy of Science", "Sociology of Science", or "History of Science" approaches commonly found in Science Studies courses. Media and cultural studies brought to the forefront of consideration the question of the socio-cultural relations between science, communication, and *popular* culture. Hitherto, critical academic interest had centred on the epistemological status of science as discourse, of science as literary text.

It is for this reason that the School of Media Studies contributed modules which developed a critical approach to science communication. All three modules in the Science Communication strand, but in particular the Communicating Science and the Reception of Science modules, were to examine the relationship between science, communication and culture in an ideologically critical manner. This aim was to be achieved by way of two forms of teaching and learning: the first involved the critical analysis of the process of science communication. The second involved using practical, 'hands-on' media production exercises as a way of illustrating the social and semiotic constraints faced by professional science communicators.

In this aspect, the Science Communication strand as a whole, and the Communicating Science module in particular, emulated the structure of certain modules in the School of Media Studies' main degree, a BA (Hons) in Media Studies. This degree, like most others of its type in the field of higher education, combined the teaching of Media Studies, with the teaching of media production. This is the modality which I described in the introduction of this thesis as the **combined modality.** In this sense, the School "exported" the combined modality to the SCC degree. This modality constituted the pedagogic backbone of the Communicating Science module, and so I will now describe it in some detail.

Combined courses in media studies mix the teaching of media studies, with the teaching of media production in higher education[6]. In the words of many, though certainly not all of the field's practitioners, courses which teach 'media theory and practice'. Appendix VIII contains some examples of courses structured on the basis of this modality.

The combined modality is quite a recent modality of pedagogic practice in higher education. It is no more than 20 or so years old. Moreover, it is one which institutionalised a number of relatively radical transformations vis-a-vis more traditional forms of teaching media production. Prior to the advent of the combined modality, and still today,

traditional forms of teaching media production were based on a much weaker classification of the field of production, and the field of reproduction. Learning media production traditionally was a matter of "in-house" training (this modality continues to exist today). As this last term suggests, teaching and learning took place within the field of production, following a model not entirely dissimilar from that of craft modalities. Prospective media producers were taken on as apprentices, who learned by watching others doing, and by participating in productions themselves.

The importance of the shift from this weak modality of classification, to a stronger classification of the teaching and the working place cannot be exaggerated. There was a shift from working in a "real" context, to working in a virtual, or imaginary context. In turn this meant that the basic semiotic axes of space, time and text were altered, frequently in a manner which rendered them entirely different from those of the primary context: few courses could afford to provide students with the latest technologies used audio-visual media production. But perhaps more importantly, the metaphorical gap that was created by the stronger classification of the field of production and the field of reproduction enabled educator and educand to question, and transform the production process in ways which would be unthinkable in professional media productions.

This was the fundamental change from the perspective of classification. I now wish to describe the changes on the level of framing. As developed in the field of production, media production is based in part on **craft discourses.** Whatever their variations (and there are many), craft discourses share an epistemological base in the ancient Greek notion of *techne*. This notion involves a disposition to act in a way which follows the rules of a craft. Although its subjects might seek to be 'true and reasonable', as a mode of production this disposition is both reliant on, and constrained by the need to adhere closely to an *eidos* (Carr and Kemmis 1986). *Eidos* is an image or guiding idea which the craftsperson is taught to reproduce, rather than to question. Eidos is, in Bernstein's terms, a category which is based on a very strong framing: there are very strong criterial rules for what counts as the legitimate text; and very strongly framed hierarchical rules, with the craftsman as 'master', and the learner as 'apprentice'. Indeed in media production, *eidos* provides very strong rules of "good style" --for example, genre rules[7]-- which must be learned and observed by producers. Here "good style" includes the professional media producer's morality (following the rules of craft practice, and producing according to the "good style"), social relationships (observing the division of

labour and hierarchy within the craft system) and identity (as producer, photographer, editor, and so forth).

Despite the importance of the craft discourse in media production, it would be romantic to regard media production as being simply a 'craft'. In film, television and other mass media forms of communication, the craft discourse has always interacted with the discourses of industrialised, mass production. Indeed, industrialised forms of media production are arguably as constitutive of mass communication discourses and of professional identities as are craft discourses. The co-development of the two discourses has always been fraught with tensions and contradiction[8]. Industrialised modes of media production threaten not *techne* or *eidos* --these actually fit in with the need for a relatively fixed, and controllable form of industrial production-- but rather, the craftsperson's identity as a craftsperson who makes a unified, and unifying product: unifying in the sense that that the craftsperson is responsible for all, or most of the production of a symbolic form, or good. Mass media production entails a number of transformations in the boundaries for the distribution of roles (camera person, editor, etc.), and boundaries for the times of roles: production stages, like preproduction, production, and post-production in TV. So it is, for example, that the cameraperson films, but does not edit, that the lighting expert sets lights, but does not film, and so forth. This process transforms the meaning of craft within media production; indeed it is probably more accurate to suggest that *elements* of the craft system remain as a meaningful cultural anachronism, a discursive 'hybrid' within an otherwise industrialised mode of mass production[9].

To return to the secondary context (the context of reproduction), the hybrid nature of this modality (craft/mass production) is evident in the teaching-learning process of many combined courses. Even as these institutions recontextualize media production skills in ways that attempt to reproduce a certain *techne* and *eidos*, they socialise prospective producers into the modalities of classification and framing that are typical of the industrialised forms of production. For example, a course on TV directing frequently involves a rota whereby each team member operates a particular instrument (camera, mixer, etc.) while another directs. Within this pedagogic modality, each team member is encouraged to assume responsibility for just his/her function. The practice of each function is determined vertically by the director, who is likely to be the only member with an overall sense of what the final product will be. Such practice promotes not only individualism, but also, an authoritarian form of

communication which feminist scholars have rightly characterised as an expression of patriarchal discourse in media production[10].

It would, however, be a mistake to regard such courses as simple devices for the reproduction of industrial media production discourses. As I suggested earlier, all combined courses transform this order to a greater or lesser degree. All create the 'virtual' or imaginary space, a process which automatically entails at least some transformations vis-a-vis the primary context. However, not all do so on the basis of the same orientation to work, and I now wish to introduce two significantly different orientations within the combined modality.

2.2 The vocational variant

I will refer to the first orientation, which is the dominant one, as the vocational. Vocational courses attempt to teach students to become producers at whatever level, in one or more of the media. I use the term "vocational", and not "market-oriented", deliberately. This is because not all vocational courses are market-oriented, in Bernstein's sense of the term. It is possible to conceive, and indeed I have taught in courses which, while being vocational, actually attempt to subvert the practices of the market-place by teaching students alternative forms of media production. There is, in this sense, a continuum of orientations, which goes from those courses which are entirely market-oriented, to those which seek to teach practices of ideological resistance or subversion of the market-place.

These "media theory and practice" courses have pedagogic discourses which recontextualize media production discourses, with so-called academic discourses: media studies, communication studies, sociology of the media, cultural studies, psychology, and so forth. The former tend to be classified as "theory", whilst the latter tend to be classified as "practice". Accordingly, the pedagogic principle is no longer simply to emulate the *eidos*, but rather to 'link' theory and practice. This entails a number of transformations vis-a-vis craft pedagogic discourse. First, the framing of media production as a manual operation is transformed into one which combines the manual and the mental. Second, the unquestionable is questioned: depending on the genre, *eidos* ceases to be a self-referencing model, and becomes a model that must be answerable to a logic that is external to itself: be it the logic of some positivist theory of journalism, or an avant-garde theory of documentary film-making. In this

sense, the framing is radically weakened, at least in principle, if not in pedagogic practice. It is frequently the case that the pedagogic codes which govern the pedagogic practice remain embedded in the old forms of classification. Indeed, an educational dynamic persists that is similar to the one analysed in chapter two: there appears to be innovation, and indeed there *is* a certain amount of innovation, but a closer examination reveals a process of 'internalisation' of the old order, in the new.

To begin with, combined courses tend to have forms of pedagogic practice which are governed by a very strong insulation of 'academic' or 'theory' modules, on the one hand, and 'media production' or 'practice' modules, on the other. It is true that relative to the traditional pedagogic device (where "in-house" training prevails) the new classification is weakened. This to the extent that the two categories, "media theory" and "media practice", are now found within one course. However, *within* many courses, a strong insulation tends to remain, both on the level of the curriculum itself, and on the level of the organisation of the institution: media 'theory' is taught by academics, and media 'practice' is usually taught by ex-producers, or at times practising producers. There tends to be weak, or no communication between the two types of educators, who are very much tied to their categories.

The problem, however, is not just that there is a strong insulation between the two types of modules. The framing tends to be based on empiricist regulative discourses, that is, discourses which oppose the mental to the manual, theory to practice. I will now describe this principle of recontextualization in some detail.

All vocational combined courses decontextualize theories and practices from the field of media studies; *and* theories and practices --or at least *discursive* practices-- from the field of media production. However, the principle of recontextualization is peculiar in that the theory *and practice* of media studies tends to be recontextualized as "theory"; and the discursive practice that is media production tends to be recontextualized as 'just' "practice". I will analyse the recontextualization of each of these in turn.

The following analysis summarises the process the de- and recontextualization of media studies, from the primary to the secondary context:

1. Certain aspects of media studies discourses, as present in the primary context constituted by research in media studies, are selected and decontextualized for the purposes of pedagogic

communication. The precise nature of the selection depends on the orientation of the course (i.e. more or less Marxist, more or less 'postmodern', more or less oriented towards sociology or towards semiotics, and so forth).

2. The selected aspects are then recontextualized as part of the new pedagogic discourse of the secondary context, but reclassified as media 'theory'.

3. The above may then have the effect of transforming media studies into a 'purely' regulative discourse, that is, something akin to a modern form of 'religious education' (e.g. a media 'ethics' class). This to the extent that students are taught to recognise the regulative orientation of the discourse, but frequently not to realise the instructional discourse associated to it in its primary context.

The process of recontextualization of media production discourses can be summarised as follows:

1. Aspects of media production discourses, as they exist in the primary context, are selected and decontextualized for the purposes of pedagogic transmission. The precise nature of the selection depends on what medium or media the practitioners choose to specialise in; and what degree of specialisation, if any, is to be achieved within the medium (e.g. a specific genre; a specific role, like that of directing). The selection also depends on the regulative discourse of the practitioners; whereas many, perhaps even most operate on the basis of a *realist* theory of instruction, many operate on the basis of an *idealist* theory of instruction (I shall describe each of these, below).

2. The decontextualized aspects are then recontextualized as part of the pedagogic discourse of the secondary context, but reclassified as media 'practice'.

3. The above transformation tends to have the effect of transforming media production into an instructional discourse, to be governed by the regulative discourse of media studies. It is however frequently the case that the insulation between these two discourses is so

strong, that the two discourses are entirely decoupled.

Having analysed the processes separately, it is now possible to speak of the new synthetic whole. Aspects of media studies are recontextualized with aspects of media production. The recontextualized aspects of media studies are explicitly or implicitly reclassified as 'theory', while the recontextualized aspects of media production are reclassified as 'practice'. With one very significant exception which will be discussed below, the tendency is to treat the recontextualized media studies as the regulative discourse which *guides* the 'skills' discourse in the development of a communication praxis. Hence, the explicit or implicit assumption that combined courses teach 'media theory and practice', on the basis of an technical model of relation between the two categories (cf. Appendix I for a discussion of the technical rationality).

This framing is based on a questionable logic of recontextualization. Prior to its recontextualization, the theory of media studies is meant to guide, if indeed that word is appropriate, the practice of *media studies*. Conversely, the practice of media production is based on its own discursive logic which is not the one of media studies. The two are framed by entirely different sets of regulative and instructional discourses. The innovation, but also potentially the contradiction of the combined modality lies in its utopian syncretism: practitioners bring together two categories in ways which overlook, or give rise to, contradiction.

In this context, it is unsurprising that there tends to remain a strong insulation of media 'theory' and media 'practice' in curricula. Indeed, I propose that the classification tends to be so strong that in effect, each 'sector' of the curriculum (media studies, and media production) is governed by its own pedagogic discourse, and the course as a whole, by a *de facto* collection code. This relative separateness at once 'cushions', but also makes possible, the contradictory projection of pedagogic subjects: the regulative discourse of the first sector (media studies) projects a reflexive and self-reflexive subject, whereas the regulative discourse of the second (media production) projects a subject which is closer to the orientation of *techne* and *eidos*.

These two descriptions are, admittedly, generalisations which would have to further developed, specified, and at times qualified by field research in a large number of institutions. The extent and nature of the reflexivity and self-reflexivity of the first pedagogic discourse depends on the type of media studies discourse being recontextualized by the institution as a

whole, and indeed, by its various educators. In any given institution there may be considerable differences in political orientation from staff member to staff member. There also tends to be a range of orientations from the perspective of theories of instruction in the teaching of media studies.

A similar qualification needs to be made with respect to the pedagogic discourse of media production. Here, however, there seems to be a more reduced range of orientations which I propose, as a hypothesis, can be situated on the following continuum of theories of instruction: at one end of the continuum we find those instructors of media production who adhere to what I will describe as **realist** theories of instruction: those that respond to the strong classification of the primary and secondary fields by attempting to recreate within the secondary context, the same conditions of production as in the primary. These instructors tend to be politically the most conservative, and the most likely to assume the regulative discourse of an imaginary, patriarchal executive producer within the classroom. On the other extreme of the continuum we find those who espouse an **idealist** or romantic theory of instruction: those who respond to the strong classification of the field of production and reproduction by taking advantage of the decoupling to teach on the basis of a romantic-idealist aesthetic of subjectivity (Kearney 1988). That is, the student as the gifted genius, who must above all be encouraged to create in ways which would not be possible in the professional field of production. I will have more to say about these theories below; for now it is worth noting that both orientations are naive orientations, in the sense that both are unaware of their own discursive, that is pedagogic discursive, nature[11].

2.3 The autonomous variant of the combined modality

Earlier, I explained that not all courses frame media studies and media production on the basis of a vocational orientation. Indeed, many have an 'autonomous' orientation (cf. chapter one). In many courses in the field, the logic of de- and recontextualization of media production is *not* guided by a desire to develop a theory-practice relationship. At least not in terms of an empiricist conception of the theory-practice relationship; and certainly not in terms of media studies being used to 'guide' a practice in media *production.* In these courses, the role attributed to the teaching-learning of media production skills is the development of a more reflexive disposition with respect to the cultural process of mass communication, 'in general'. To

use the discourse of some educational practitioners, the media production workshops are meant to further the educands' *understanding* of the media. There is a theory of instruction according to which 'hands on' learning about the basics of media production enables students to understand 'in a practical manner' the constraints faced by media producers. It also enables them to explore the nature and significance of semiotic forms employed by producers. In effect, the media production courses are transformed into an 'audio-visual aid' in the service of the acquisition of the categories of media and cultural studies.

In principle, this approach eludes the empiricist tendency, at least on the level of general rules of recontextualization. Indeed in principle, it constitutes an even more radical break --perhaps I should say a true break-- with the dominant pedagogic device inasmuch as its advocates argue that the problem of developing a critical media production practice is less important than the problem of preparing students to become more critical media *readers*, and thereby, more critical subjects (some might use the term 'citizen'). Whereas the vocational courses take for granted that teaching and learning media studies and media production has a vocational function, the 'autonomous' orientation questions, and indeed rejects that assumption.

As I have just suggested, this orientation is undoubtedly more radical than the first. There are, however, three aspects of this orientation which can be critiqued. The first is the problem of autonomous orientations in general. There is both a certain arrogance that students need not worry about acquiring visible categories for the purposes of job placement, and with it, a naivete with respect to its own implicit reliance on a bourgeois model for the exchange of cultural capital (cf. chapter one). Another related problem is that this orientation takes for granted that students will --or 'should'-- understand and accept this orientation. In this sense, this orientation is a moralistic, and logocentric one. The last problem, which I will illustrate in the rest of this chapter, is that even this modality of framing is prone to the vicissitudes of empiricist modalities of pedagogic practice. Even though the recontextualization of media production may not be designed to serve vocational ends, the classification and framing of media production in curricular practice tends to be based on forms of insulation and forms of relation between categories which reproduce the opposition between theory and practice, manual and mental forms of production. This to the extent that in these courses too, there remains a strong classification of the staff who teach 'theory' and 'skills', and indeed, a

framing which continues to treat each as just that: 'theory' and 'skills'.

Despite the substantial differences which I have noted, I propose that both orientations tend to have the same effect from the perspective of students' acquisition of the different categories. First, media studies tend to be recontextualized in ways which enable students to acquire rules of recognition, but not rules of realisation of academic discourse. This may be partly the result of the generally weak framing of media and cultural studies, as regionalizations of knowledge in their own right[12]. But I propose that it is also the result of the logic of recontextualization of the combined modality, which is oriented mainly towards teaching students to acquire the regulative orientations of the academic discourses, be it Marxist, Neo-Marxist, Modern, postmodern, or other. Especially in the combined modalities of vocational orientation, the rationale for this failure to teach rules of realisation appears to be that it is not necessary to acquire strong rules of realisation of the 'academic' discourse because students are being trained to become producers (or simply, 'more critical citizens').

But an analogous process occurs in relation to the acquisition of media production: with the possible exception of courses with a very strong media production orientation (and a very weak media studies orientation), the tendency is for students *not* to acquire the rules necessary to realise any of the existing media production discourses by the time they leave the course.

To the extent that this happens, then it seems plausible that the combined modality as a whole is likely to have a doubly disempowering effect on students, from the perspective of the acquisition of rules of realisation. With the possible exception of those courses which have an extremely weak media studies aspect, the combined modality doesn't enable students to acquire the rules of realisation for media production. But it also fails to provide students with the rules of realisation of the academic discourses (media studies).

To conclude this section, I now wish to return to the Communicating Science module. Up until 1994/95, when I instituted the changes mentioned in section one, the module was structured on the basis of the autonomous variant of the combined modality. The module combined the teaching and learning of media studies and media production as a way of developing students' understanding of science communication. Beginning in 1994/95, I actually attempted to shift the module towards the vocational variant, albeit, a *critical* form of the vocational modality. My aim was to use media studies as the basis with which to teach students a praxis in science

communication. In the sections that follow, I will analyse this process in some detail.

3. Communicating Science: from collection, to integrated code?

In this section I will answer the following question: the changes which I instituted in the 1994/95 academic year were meant to 'integrate' what I then conceived as media theory and practice, in an effort to develop a praxis in science communication. In the terms of this thesis, one might expect the changes to constitute a shift from a collection code, to an integrated code. Did this shift actually occur?

Prior to my arrival at the university, and indeed up to the 1994/95 year, there was a strong classification of media studies and media production. On the level of staffing, different types of staff members were tied to each category, with little or no communication between them: as the lecturer, I taught media studies but not media production; in turn, the instructors taught media production, but not media studies. In this sense, teaching in the new SCC course was no different from teaching in the mainstream BA taught by the School of Media Studies, where historically this form of classification prevailed until a new generation of lecturers arrived, who like myself attempted to 'integrate' the different practices.

On the level of the curriculum itself, this classification was echoed by evaluative rules which created a strong temporal and spatial insulation between the different discourses. Here the figure of the curricular genres was of great importance. Lectures and seminars were taught by the lecturer, and were the spaces for media studies; workshops were taught by the instructors, and were used to teach media production. Whereas the lectures and seminars were taught in standard university lecture or seminar rooms (more on this later), the media production was taught in the make-shift studio of the Audio-Visual Services.

This meant that the insulation between the two categories (media studies and media production) was so strong, that the two 'strands' of the Communicating Science module were almost two separate modules. Up until 1994, a collection code thus governed the principle of classification and the framing of each category.

There was, however, one potential contradiction to this rule. As I explained in section one, the two strands (media studies and media production) were supposed to come together for the purposes of the

summative assessment, that is, the final video production. This constituted a weakening of the collection code inasmuch as it weakened the insulation. It forced me to use seminar time to prepare students for the final production; and it forced instructors to yield to the criteria of assessment set up by the lecturer.

Prior to my arrival at the university, this weakening of the classification was avoided to the extent that the lecturer simply did not prepare students for the final production. The lecturer marked the final production, but for all practical purposes, the instructors set the criteria for the final production, and prepared the students. There was no weakening of the boundaries, and no horizontal communication.

When I first arrived, I took a more active role in setting the criteria for the final production, and in preparing students for this production. But I faced something akin to a discursive 'inertia' produced by the insulation of the *curricular genres* (with separate spaces, times, and staff for the teaching of the different discourses). Unless I was willing to spend more time teaching that was expected in my contract, this insulation was too great for me to have any effect on the final production. To the extent that there was no integration during the first two-thirds of the academic year, I found that I could not simply establish 'a link' or 'integration' for the purposes of the final production during the final weeks of the academic year.

Hence, the changes which I instituted for the 1994/95 year. These changes can be regarded as an effort to weaken the classification, change the framing, and to organise the whole course around an *integrated* code. Whereas the previous scheme attempted to unite the two strands for one final, summative assessment, I restructured both the assessment structure, and the use of the seminar in a manner that was designed to produce, despite some constraints, integration throughout the whole year. This entailed numerous meetings with the instructors-- in effect, increasing the horizontal communication-- and changing the entire way in which the course was taught.

However, after one year, the course remained a divided one. One fundamental factor in this process was that, despite the changes I instituted, students were still taught media studies by a lecturer in one space (lecturers, and seminars), and media production by instructors in another (workshops). Try as I might to use the seminar spaces to engage with the design and analysis of the production process, I remained at one remove from the actual production, and post-production processes, which

continued to occur in the workshops, only. In this sense, the insulation produced by the curricular genres and staffing undermined my efforts to change the orientation of the course, and the collection code prevailed.

This continuing insulation was, however, only a part of the problem. My *framing* of the different discourses also undermined my own efforts to integrate the different forms of practice. For this reason, I will now analyse the way in which the instructors and I recontextualized each of the discourses (media studies and media production) in the course.

4. The recontextualization of media studies, and media production

I will begin my analysis of the aspect of framing with a detailed analysis of the transformations produced by my recontextualization of certain forms of media studies. Thereafter, I will analyse in some detail the transformations produced by the instructors' recontextualization of media production.

4.1 Recontextualizing media studies

Although I have thus far spoken of media studies as a single discourse, it is more accurate to say that I recontextualized a variety of academic discourses from within the field known as media and cultural studies. This happened because I was covering both the production and construction of popular science; because I was examining a variety of media and genres; and finally, because there was a paucity of academic texts which analysed popular science communication from the perspective of media studies. I was thus forced to be something of a bricoleur. Even so, I tried to organise the various regulative and instructional discourses on the basis of what can be described in a very general sense, as a social semiotic perspective to science communication[13]. In effect, I tried to teach students the rudiments of social semiotic analysis. The regulative discourse of this approach was a Neo-Marxist one. I employed textual analysis and discursive analysis to critique relations of domination, as part of a project of critical social transformation. The identity this approach promoted can be described in terms of the reflexive and self-reflexive analyst, who strives to show what material interests inform the use of textual forms, and vice-versa: how textual forms inform the materiality of social interests or discourses.

It is important to note that I taught this regulative discourse not as an end in itself, but as an *aspect* of an ideologically critical disposition towards the reading and *production* of science communication. My ultimate aim was to attempt to foster a praxis in science communication. This led to a logic of recontextualization of media studies which I will now analyse in some detail. The following are some categories which describe the different transformations which this process entailed, and some possible effects of each type. The categories are not mutually exclusive. Further research into other lecturer's teaching processes might reveal that these categories can be generalised to the teaching experience of other practitioners in the field; for now, my only claim is that they describe dynamics within my own process of recontextualization.

- Dehistorization: This term describes a transformation which delocates a given theory or theoretical approach from its historical context. This is, in one sense, an automatic and necessary process in teaching, a necessary process of pedagogic discourse. There are, however, more or less radical ways of dehistoricizing texts. Media and cultural studies, and therein social semiotics, constitute on-going research practices with a history of paradigmatic (in the Kuhnian sense of the term) shifts and transformations. They are also research practices which are embedded in a social history. (Clearly, the two histories are inter-related.) As I taught them, social semiotics and related methodologies of research were radically delocated from their paradigmatic and historical contexts. This was partly the result of the fact that the module had a 'split' identity as an introduction to media studies for science communication on the one hand, and as an introduction to media production on the other. However, it would appear that this process was also the result of the weak framing that is so frequently described as 'interdisciplinarity' in the field of media and cultural studies. (In this field, it is common for authors to recontextualize a variety of authors without an extensive contextualization of their theories.) The process of dehistorization I am describing could have the following effect: to understand a research practice, and to learn how to engage in a rigorous and methodical analysis (semiotic or other), it is necessary to understand the history of the practice. Radically delocating the research practice from its history, in the absence of any other equally strong (academic) history, is likely to make it more difficult for students to

acquire the rules of *recognition* required to understand media studies.

- Reduction: I use this term to describe transformations which deprive a research methodology of its methodological complexity. To dehistoricize is, amongst other things, to decontextualize a research discourse from the diachrony constituted by successive research *questions*. To 'reduce', is to simplify, or even omit the density and complexity of the *principles* used to answer those questions. Media/cultural studies, and particularly social semiotics, constitute research methodologies with explicit and implicit principles of description. As taught in my course, these methodologies were transformed into a "method" of "media analysis" which was illustrated by means of little more than the exemplification of the application of key concepts-- such as 'discourse', 'genre', and so forth. Such a process is perhaps inevitable in an introductory, and especially a 'split' introductory course like Communicating Science. I have however noted a similar tendency in both the teaching of colleagues, and in some textbooks which purportedly teach students how to engage in semiotic analyses[14]. Again, the likely effect would be to reduce students' ability to acquire rules of *realisation*, in this case the principles of description required to engage in a disciplined (as in 'disciplinary') textual analysis.

- Extension: I use this category to describe processes whereby the educator transforms a given theory or theoretical approach by employing it to analyse phenomena which the theory was not originally intended to analyse. In Bernstein's terms, it involves a weakening of the framing of what counts as a legitimate object of study, for a given theory or theoretical approach. Popular science communication in the mass media has thus far been, with one important exception[15], a virtually untheorized domain in media studies. I thus had to "extend" the theories of media studies to describe science communication. For example, in the second unit I explained how science communication was an instance of public service broadcasting. To contextualize the notion of public service broadcasting, I used Scannel (1991). This entailed the following transformations: first, treating the communication of science as an instance of the public service discourse; and second, treating the concept of public service as discourse, in the Foucaultian sense of

the term. Scannel (1991) does neither of these, and as a result I 're-politicised' the academic discourse (see *repolitization*, below).

- Graft: This is a related, but distinct form of recontextualization. It also involves a weakening of framing, but this time, the framing of two or more theories or theoretical approaches (extending involves using an existing theory/theoretical approach to explain a phenomenon which was not previously explained by it.) For example, in the absence of a social semiotic theory of time-based media, I grafted together concepts from H. Zettl (1990), Aumont et al. (1992), and Bettetini (1984). This form of recontextualization is prone to discursive discontinuities, and even contradictions. In the example cited above, it should be noted that none of the authors works with a "motivated" concept of the sign, as Hodge and Kress (1988) do. Nor do they work with the Foucaultian concept of discourse. This meant that I had to draw on a variety of scholars and traditions of research to describe different aspects, levels, and historical events in science communication. This led to a a juxtaposition of approaches with varying degrees and levels of methodological discontinuity. In my experience, this process is typical of courses in media and cultural studies, and is frequently described in the field as 'interdisciplinarity'. In fact, it is not even multidisciplinarity: the concept of disciplinarity, in its positive connotation of methodical explanation, is virtually lost. Some juxtapositions may 'work' in the sense that there is little or no discontinuity between the two theories on either the regulative or the instructional level. My use, for example, of J. B. Thompson's (1990) theory of mass communication is relatively continuous with the work of Hodge and Kress (1988). But to use a different example, there is considerable methodological *discontinuity* between the approach of Hodge and Kress (1988), and the approach taken by Myers (1990). From the perspective of the regulative discourse, the latter scholar works on the basis of an approach which does not materialize textual forms in the way that Hodge and Kress do. From the perspective of the instructional discourse, there is very little if any continuity in the use of categories, concepts, and forms of analysis. Yet in the bricolage that was my Communicating Science course, the two were juxtaposed with no reference to the substantial differences between the two, thereby dissimulating substantial discontinuities and even contradictions between the two.

- Repolitization: Here I refer to a process which attempts to embed the instructional discourse of one discourse, in a different regulative discourse. To the extent that many theories of media representation, or of media production lack a critical orientation to power and ideology on the level of their basic concepts, I found myself having to re-politicise those theories along ideologically critical lines: that is, explaining the social process involved in terms of discourse, and 'motivating' its signs in ways which the original scholar failed to do. This transformation can be regarded as being fundamental to the rest. Unless made explicit, such a transformation may suggest to students that there are no real discursive differences amongst theories.

The above transformations are, from one perspective, the stuff of everyday teaching, the stuff of research itself. My purpose in enumerating them is not to appeal to a misleading image of discursive 'purity'. My purpose is to highlight first, the extent to which the teaching *did* entail numerous transformations, vis-a-vis the primary (intellectual) context; and second, the extent to which such transformations might have the effect of making it more difficult for students to acquire *both* the rules of recognition, and realisation of the academic discourse. I have argued that by producing unexplained discontinuities, gaps, or even contradictions in the explanations, my process of recontextualization made it more difficult for students to acquire the discourses. Moreover, when placed in the context of the relatively strong framing of natural science discourses, it could also have the effect of persuading students that media studies was no more than a "common sense", "undisciplined" form of analysis. I will return to this last point in chapter four.

4.2 Recontextualizing media production

I will now analyse the logic of recontextualization of media production 'skills', in particular, *video* production, as applied to the production of short documentaries about science, technology and/or nature.

During my first year of teaching on the degree (1993/94), the workshops were run as virtually autonomous modules. The instructors

recontextualized video production 'skills' on the basis of a regulative discourse which was influenced by two contradictory theories of instruction. The first of these, an idealist theory of instruction (cf. section two, above), encouraged students to 'play' and 'experiment' with the video medium. At the same time, and in a relation of contradiction to this very discourse, aspects of the teaching-- the teaching of actual media production styles-- was based on a realist theory of instruction, which reproduced normative media grammars. Here I refer to R. Odin's (1978) suggestion that the teaching of film production has traditionally been based on scholastic models of grammar, which teach the rules of a "good style". Normative grammars attempt to instrumentalize meaning by setting it in semiotic stone. This by radically decontextualizing the meaning of forms from the context of communication, and by assigning fixed meanings to particular forms. For example, instructors taught students the rules associated with "continuity editing": avoiding jump cuts, justified angles, etc.[16]. The instructors thus taught by inviting the students to experiment with the creation of new messages (idealist theory of instruction), even as they taught students to edit those messages on the basis of the normative media grammars (realist theory of instruction). Here it is worth noting that on one level, there was very weak framing of the pedagogic text: students were given great freedom to choose subjects, genres, and so forth. However, on the level of frame-shot-montage, the tendency was to teach on the basis of a much stronger, and 'realist' framing.

In 1994/95, I tried to change the framing relation in two ways. First, I changed the overarching logic of recontextualization from the autonomous, media production-as-teaching-aid approach, to one which attempted to develop a praxis in science communication, in relation to a particular genre: short TV news documentary pieces, about science and/or nature. The integrating principle was meant to be media studies as the theory with which to develop a more critical way of representing science, in the (video) news genre. This transformed the orientation to media production which had been favoured by the module designers (the course was designed prior to my arrival at the University). There was a shift from an autonomous, to a (critical) vocational orientation. To the extent that instructors were required to structure their own teaching around a particular genre, then this shift also entailed a shift in theories of instruction: the idealist theory of instruction was eliminated, to the extent that students were no longer to be given the freedom to choose or 'make' their own genre.

But the changes were also meant to put an end to the realist theory of instruction. The new principle of integration was designed to establish, in principle and in practice, the subordination of so-called 'technical' decisions, to a process of critical reflection. The structuring of seminars around the design, and analysis of exercises was meant to provide a space in which students learned to become not just reflexive vis-a-vis other producers' messages (as in the old seminar structures), but *self-reflexive* with respect to their own messages. A key part of this was my plans that students should learn to work with the constraints of a specific genre, but also to question the genre, and perhaps eventually transform it.

Was I successful in transforming the original framing of the module? My analysis suggests that I was not. First, my efforts to switch to an integrated code were not based on a sufficiently explicit formulation of the relation between the different categories. My failure to develop an explicit formulation, in the context of the strong classification of the curricular genres which remained even after the changes were in place, meant that a discursive gap remained whereby both the instructors and I continued to teach on the basis of different regulative orientations. I was unable to articulate how a critical media studies could be employed to develop a critical form of media production. As this last sentence suggests, I had in any case relapsed to the traditional discursive syncretism, according to which it is overlooked that media studies is not actually *meant* to 'guide' media production.

Second, my efforts to change the framing-- and the classification-- were resisted by both instructors, but especially by the senior instructor. Here it is crucial to understand that the strong insulation between categories, and the weak integrating principle of the 'teaching aid' logic of recontextualization, provided instructors with a degree of professional autonomy which began to be lost when I weakened, or attempted to weaken, the classification of seminars and workshops, of spaces for media studies and spaces for media production. The presence of a de facto collection code prior to my arrival meant that the instructors were virtually free to structure their teaching as they pleased. From their perspective, the changes in framing constituted a transgression of their space, and of their category. Unsurprisingly, they resisted the changes by arguing that their own teaching was more effective. After four to five weeks of teaching on the new scheme, the senior instructor refused to teach the workshops on the basis of my theory of instruction. This despite the fact that I had consulted the changes with this and the other instructor (both instructors had

actually accepted the changes with considerable enthusiasm the previous summer.)

Along with this conscious resistance, the instructors continued to teach according to their traditional theories of instruction. It is a matter of some interest that, even as they resisted my transgressions of the established boundaries, the instructors interpreted my proposed changes as a shift to a more realist theory of instruction. They assumed that they were being asked to teach students to reproduce the genre form, not to question it. However, and this also marked an extremely important shift in framing, from time to time the instructors reverted to the idealist theory of instruction, and allowed students to 'play' with the equipment. The logic of recontextualization in actual pedagogic practice in the workshops thus continued to oscillate between idealist and realist theories of instruction.

I will now describe some of the discursive transformations which occurred in the workshops on the basis of this pedagogic discourse. Once again, the categories that follow are not mutually exclusive. And once again, further research might show that these categories can be generalised:

- Trans-institutionalization This category signals changes in the nature of the social relations, and in the accumulated resources available for video production. The video-exercises were not produced in an actual media organisation. They were produced in the context of the Humanities Faculty Audio-Visual Services, and of course in the context of the Communicating Science module. In general, the context in which media representations are produced in universities entails a number of transformations vis-a-vis primary contexts. The time, space, resources and social relations in the university institution are quite different from those of a media production institution, even if a part of the university is deliberately structured in a way that attempts to reproduce professional working conditions. The University Audio-Visual Services, and the Communicating Science module were no exception to this process. Indeed, I would highlight the following institutional transformations: first, the working relations changed insofar as the relatively rigid, and strongly classified and framed functions that are typical of television news production crews were replaced by far more fluid forms of classification and framing. One of the course requirements was that

students should establish a division of labour-- producer, camera, researcher, etc.-- in such a way that all students would work as a collectivity, towards a common goal. When this form of classification and framing occurs in the primary (media production) context, it is controlled by a hierarchy whose leading members have the power, at least in principle, to dismiss any employee who fails to observe the established system of classification and framing. These structures did not exist in the workshop productions. The only (weak) source of coercion was the threat of a lower mark if students failed to work effectively as groups. This difference had the effect of transforming working relations. Students either had to negotiate amongst themselves to achieve a cooperative effort; or, as frequently happened, some students ended up doing the work of those who didn't participate. But it also had the potential to transform what I will describe as the unity of the text. Under any circumstances, the question of the unity of the discursive subject of the audio-visual text is a complex one[17]. In situations in which there is no single clear project which is either shared by all or commanded by one, texts may result which are totally fragmentary and incoherent. This potential was exacerbated by the process of trans-institutionalization. Second, and linked to the first transformation, team work in television productions in the primary context presupposes a high level of specialised competence on the part of each team member. In professional practice a pedagogic discourse creates distinct identities for individuals specialising in different production functions. This serves to reinforce the boundaries. This is, in many respects, the *sine qua non* of professional realist productions. The absence of such a specialisation in the workshops hindered and at times totally blocked the realisation of certain production plans, with the concomitant effects on the video text. Third, the constraints in terms of time, space, and production resources for this course were also very different from those found in the primary production context. Students had more time to plan and produce the final productions. However, they had less space, both literally and metaphorically, to produce the video: especially during the exercises, but even during the final productions, the lack of time and adequate transport meant that most groups worked in the immediate vicinity of the St. Andrews campus. This had the effect of curtailing subjects and approaches which they might have addressed or employed otherwise.

- Trans-generation: This category involves shifts in the construction of the genre of the media production. As strategies of interaction (cf. chapter one), genres are the result of a variety of discursive forces. They are the result of complex institutional structures, as well as complex relations within and across fields of interaction. Genres are thus likely to be changed at least in part by changes in the institutional structures and fields that mediate them or are mediated by them. I have just noted some important institutional transformations, and these undoubtedly produced significant changes in the texts produced by students (these texts will be discussed in chapter four). However, it is also likely that genres would change on the basis of what students were taught in other sectors of the module, and the SCC course as a whole[18]. Put simply, genres are to some extent the recontextualization of available discourse, and the available discourses in the SCC course were quite different from those found in a primary science communication context.

- Repolitization: I have already defined this category of transformation. I have also explained that within the workshops, the instructional discourse was embedded alternatively in the regulative discourses resulting from realist, and idealist theories of instruction. Especially the second orientation involved a transformation vis-a-vis the field of production: each student as having the potential to be a gifted, and genre-less creator, if only s/he were given the chance to experiment. Finally, if the 'integration' of the different forms of practice (media studies and media production) were to be successful, we would expect a shift in the regulative orientation of the video productions, towards more ideologically critical forms of representation. (I will analyse the extent to which this occurred in chapter four).

On this level of the module, as in the one devoted to teaching media studies, I propose that the logic of recontextualization had the effect of weakening the framing of the categories. Again, this process may be a beneficial one, provided it occurs in a context which establishes clear principles for alternative modalities of framing. In the case of the Communicating

Science module, the alternation of theories of instruction described earlier, and the various institutional transformations merely had the effect of weakening the framing *without providing an alternative modality of framing*. The result was thus no more than a certain dis-ordering of the dominant principles of production, and with it, the likelihood that most students would not acquire the rules of realisation for the dominant modality of media production practice.

5. On the visibility of pedagogic practice

I will now analyse pedagogic practice in the Communicating Science genres from the perspective of pedagogic visibility. In the most general sense, the pedagogic practice in the module was a visible one. This to the extent that there was an assessment regime that tested and marked students' acquisition of discourse; and indeed that overall, the hierarchical, sequencing and criterial rules were oriented towards teaching students to acquire particular categories or discourses.

Having recognised this, it is immediately necessary to qualify the statement by suggesting that, *relative to the pedagogic practice in the rest of the SCC curriculum,* pedagogic practice in the Communicating Science module was relatively *invisible*. Although assessment was marked, the emphasis in the module was not on producing finely gradable and stratified performance, but rather, on the acquisition of a shared, and critical disposition vis-a-vis the communication of science. Moreover, relative to pedagogic practice in the science strands of the curriculum, virtually all of the framing rules governing pedagogic practice (hierarchical, sequencing, criterial) were relatively implicit.

First, hierarchical rules weakened vis-a-vis other modules in SCC to the extent that many, if not most students a) regarded themselves as 'experts' in the media; and b) regarded media studies as producing no more than commonsense statements about science communication; and c) regarded media studies as being of secondary importance, vis-a-vis the teaching of media production. I would argue that educator-educand hierarchy, from the perspective of 'expertise', was thus weakened.

The pedagogy was also relatively invisible from the perspective of the sequencing rule. The general criterion for sequencing in the Communicating Science module was a theoretical one: a conception of mass communication which distinguished for analytical purposes between

the *production, construction,* and *reception* (Thompson 1990) of mass mediated messages about science and nature (the Communicating Science module, it will be recalled, concentrated on the first two). I used this distinction to divide the course into units about the institutionalised production, and construction of messages about science and nature. Indeed, the following is the order in which I structured the various aspects of the course:

1. An introductory unit that explored commonsense notions of communication, and which introduced a social semiotic conception of communication (including the tripartite distinction between production, construction and reception)

2. A unit on a variety of issues arising with respect to the production of messages about science in the mass media, with emphasis on professional discourses in the production of science on TV

3. A final unit which was a series of case studies on the construction of messages about science and nature in the mass media, again with special emphasis on TV.

The SCC curriculum itself used this tripartite distinction to the extent that it reserved analyses on the level of reception for the second-year "Reception of Science" module. Unless students understood the logic of this tripartite distinction -- and most didn't until well after the course had commenced-- it was not possible for them to discern the logic of sequencing. To be sure, the syllabus I provided to students did not clearly mark off any sequencing criteria. Indications of sequence were thus based entirely either on oral cues given in lectures and seminars, or on visual cues provided during lectures with the overhead projector.

This form of sequencing was in notable contrast to the sequencing of the three DSCC modules, which progressed across the three years of the degree from one historical period to another, and from the discovery/development of one scientific idea/paradigm to another. It was also in notable contrast to the teaching of the MPLP subjects, and the Issues modules, which were also based on sequencing rules whose logic was immediately discernible by students: going from one *subject* or *issue,* to another.

Within this broad mode of organisation (from the production to the

construction of mass media messages about science and nature), the sequencing in Communicating Science was based on the introduction of key concepts in the social semiotic analysis of messages about science and nature: communication, discourse, ideology, and so forth. The different social semiotic concepts are themselves not in a relation that is based on a strong internal classification. Unlike the more positivist conceptual framework of say, M.A.K Halliday (1994), the concepts employed by Hodge and Kress (1988) may be more difficult for both beginners *and* professional researchers to distinguish in analytical practice[19]. The classification and the framing of discourse, text, and genre is relatively weak. This made it difficult to establish a learning sequence which was explicit, and readily understandable by students.

Another aspect worth noting about sequencing in Communicating Science is perhaps the most fundamental one. According to Bernstein, traditional pedagogies tend to progress from the relatively 'superficial' to the 'underlying' causes of phenomena. This with narratives which, in Bernstein's terms, promise that the mysteries or 'secrets of life' will eventually be revealed. My own sequencing *began* by revealing the 'secrets of life'. This to the extent that I began by explaining the significance of symbolic forms and discourse. To do so was in effect, to explain, *from the very beginning*, the logic underlying social practice in the field of science communication. I will explain in chapter four that this was an experience which was both incomprehensible, and unsettling for many students.

Where criterial rules are concerned, the aim of the Communicating Science module was to teach students a critical disposition with respect to science communication (both as 'readers', and 'producers'). I attempted to make this general criterion explicit in the syllabus given to students, and indeed during the first lectures. However, its degree of abstraction, and basis in 'internal' dispositions made it relatively invisible, when compared to the acquisition of say, the 'signposts' of European history.

The teaching of more specific aspects of the course also tended to be based on relatively implicit criterial rules. This was particularly true in the case of the teaching of social semiotic analysis. As I explained earlier, the categories of social semiotics are not themselves highly 'discrete'. Moreover, my teaching remained structured by the logic of recontextualization that I analysed in section four (above). Implicitly, I continued to teach media studies as the 'theory' which was meant to guide media 'practice', and this had the effect of framing the teaching of semiotic analysis as a form of 'guiding' media practice. But the manner in which this

link was established tended to be tacit, and implicit. There was no specific theory of media production which provided explicit rules for more critical forms of mass communication.

For all of these general reasons, I am arguing that the pedagogy in the Communicating Science module was, on the whole, a *relatively* invisible one: invisible in comparison with the pedagogy that prevailed especially in the teaching of the natural sciences. Having made the general statement, I must now qualify it: each different curricular genre mediated the pedagogic framing in particular ways, and I will now engage in a more detailed analysis of pedagogic practice, this time from the perspective of differences in the lecture, seminar, and workshop genres.

5.1 Lectures

Each week, I gave one hour-long lecture for the Communicating Science module. The lecture was delivered to all first-year SCC students. This meant that I taught as many as 50 students during each lecture. I was assigned the largest lecture hall on site, with a capacity for approximately 200 students.

In general, lectures involve a strong framing of the pedagogic roles of educator and educand. In the case of Communicating Science lectures, this was the case in a variety of ways: with the exception of any student questions, I did the speaking, and I did so standing on a raised platform facing the students. In this sense, the layout of the auditorium was itself clearly based on a strong classification and framing of the roles of educator and educand.

For each lecture, I employed a routine which can be described as being ritualised, in Bernstein's sense of the term: the routine served to establish boundaries, and through them, a relation of authority. Before each lecture began, I put up an overhead transparency with the title of the lecture (cf. Appendix XII). During the lecture, I marked the different points of the lecture by progressively uncovering a sequence of OHP statements which summarised key points in the lecture. Before each lecture, I left hard copies of the OHP transparencies in the library. This ritual can also be regarded as a framing technology, to the extent that I used it in order to attempt to facilitate, but also to control, students' appropriation of the course.

A significant exception in this process occurred when I analysed a

media text. In these cases, I relied more on oral cues, and interaction with the video and monitor. Indeed my analysis of my lecture notes, and overhead transparencies suggests that I employed variations of two basic modalities of pedagogic practice in my lectures. I will call the first **concept-oriented**, and the second, **media analysis**. Although some lectures included both modalities, it was more frequently the case that my lectures were structured predominantly around one or the other of these modalities.

By concept-oriented, I refer to a modality in which I structured the lecture around the explanation of a sequence of "key concepts". Appendix XII contains an example of this modality: a lecture in which I introduced and historicised the concept of "public service broadcasting", and then used this as an illustration of another concept: the concept of discourse, which I defined along Foucaultian lines. The lectures which described the general theory of communication, and the production aspect of mass communication were predominantly structured around this modality.

By media analysis, I refer to a modality of lecturing which involved the presentation and the analysis of media texts about science and/or nature. Appendix XIII contains an example of this modality, in the form of a reading I wrote for a lecture involving a media analysis of a television advertisement which made an appeal to "the natural". Although the appendix text is of course quite different from the lecture itself (it is a course handout, not the lecture itself), it gives the reader an idea of the differences in the framing of this modality, vis-a-vis the concept-oriented.

A comparison of the two modalities suggests that the concept-oriented modality was based on a more visible pedagogy than was the media analysis modality. The concept-oriented modality entailed presenting, defining, and exemplifying concepts which were, on the whole, new to the students. To the extent that the terms were new, and that they were defined explicitly, this form of teaching created a more explicit relation of authority: in effect, I was saying 'learn this'. In contrast, the media analysis modality entailed showing a piece, and then describing it. My descriptions tended not to be highly structured; I pointed to key aspects but did so using a discourse of 'revelation' rather than a discourse of 'dictation'. The difference on this level can be described as the difference between saying 'learn this', and 'see this'. Both imply a form of command; but the nature of the command is very different. Only the first explicitly requires students to acquire a category.

Indeed, to the extent I defined concepts by way of the OHP, asked students to write the definitions, and used relatively discrete sequences of

arguments which I also put up on the OHP, then the sequencing rules were also more explicit in the concept-oriented modality than they were in the media analysis modality. It follows that the criterial rule was also more explicit in the concept-oriented modality. This to the extent that there was a discrete concept to learn, as distinct from some textual feature to 'see'.

Despite differences in visibility between the two modalities, it is worth reiterating that my teaching in both modalities was not geared towards preparing students for traditional assessment (e.g. seen or unseen examinations, asking students to define terms). In Communicating Science, the traditional final examination was replaced by a final (video production) project. Although students were asked to do a textual analysis, the teaching was not explicitly geared towards preparing students to *perform* the practice of textual analysis, on the basis of a highly explicit criterial framework. Moreover, I have already explained that most students did not perceive the need to acquire categories of media analysis to the extent that they confused textual analysis with 'commonsense' interpretation.

Before turning to pedagogic practice in seminars, I wish to anticipate two important aspects of student response to these modalities: first, most students disliked the lectures that were predominantly concept-oriented, and tended to participate less in them when asked questions about them in seminars. And second, most liked the lectures that entailed media analysis, and tended to respond more readily to my questions about these lectures during seminars. However, their preference for the latter modality did not appear to translate into greater acquisition of categories in that modality.

5.2 Seminars

Within the Faculty of Humanities, many lecturers and students explained the purpose of seminars in terms of the level of intimacy of the interaction: seminars were designed to provide a pedagogic space in which students could interact in a more interpersonal way with lecturers: that is, they could ask questions, and could bring to the course their own concerns and interpretations. In this sense, the function of the seminars was understood in terms of compensating the lack of such a space in the lectures. In this subsection I will explain why this constituted a naive interpretation of the seminar genre, and more importantly, of the relationship between the lecture and the seminar genres, at least where the Communicating Science module was concerned.

After each lecture, students divided into seminar groups of 12 or so students (staff members determined the make-up of each group at the beginning of the year). I requested that each of these seminar groups should be made up of two *workshop* groups of approximately six students, so that I could discuss plans for workshop productions in the seminars (normally workshop groups were different from seminar groups). Whereas I delivered the lectures in a large hall with a strong spatial classification and framing of educator and educand roles, the seminars took place in relatively small rooms, with circular or semi-circular seating arrangements. Within each of the seminar rooms (and there were several rooms, whose size and type of seating varied slightly from room to room) there was always a large television set and a videotape recorder. On the numerous occasions in which students and I analysed videos, the semi-circular arrangement tended to be organised around the TV/video set.

At first glance, we might expect this spatial arrangement to have the effect of blurring the spatial dimension of the symbolic boundaries between educator and educand. In turn, we might expect this to reduce the distance in hierarchy (hierarchical rule) between lecturer and student. However, this blurring can be more than 'compensated' by means other semiotics: if, for example, the lecturer adopts a lecturing disposition in which s/he does most of the speaking, or if s/he consciously or unconsciously exhibits a very formal body language or *hexis* (Bourdieu 1990), or if the form of questioning frames responses very strongly, then these semiotics would more than compensate for the weakening of the framing of educator/educand rules in the spatial semiotic. In the following paragraphs, I will explain why and how this happened in many of my seminars.

I structured my seminars according to two different modalities: one involved discussing ideas introduced in the lectures. I will call this the **post-lecture** modality. Another involved preparing and then analysing students' video production exercises. I will call this the **video exercise** modality. This last modality can be sub-divided into **planning** and **analysing** modalities.

During the seminars which I organised along the lines of the *post-lecture* modality, I invited students to ask questions about the lecture, and if there was no question, I returned to some of the key points and asked students if they had understood this or that point. The 'informal' seating arrangement, and the greater intimacy of the space itself may have weakened the framing of the roles of educator and educand vis-a-vis the lectures (indeed students later reported that the size of the lecture hall was a significant inhibiting factor when it came to asking questions). However,

in retrospect it is clear that a combination of factors acted to 'compensate' for this weakening of the boundaries. To begin with, my questions tended to be couched in an academic discourse which many students found intimidating. Moreover, my posture, and emphatic tone of speaking, gaze (looking questioningly from student to student) acted to reestablish the educator/educand boundaries where hierarchy is concerned. All of this meant that, contrary to what might be expected from this curricular genre, it was I who usually asked the questions, and returned to points made in the lecture during the post-lecture modality.

This dynamic can be explained in part with reference to my own inability to render 'invisible' my own pedagogy, on this level. The 'art' of the seminar is to 'fill' the teaching space, with the learning space. This was not an 'art' that I had acquired at the time. It is, however, important to politicise and make more complex this explanation of the seminar process. As Bernstein notes, the students' protagonism in 'invisible' pedagogies may be more apparent than real, and indeed I want to argue that the real, or main function of post-lecture seminars in my seminars and in those of my colleagues was one of control. Controlling the students' appropriation of knowledge. This need for control must be linked to the relative lack of control of the pedagogic communication in lectures. The lecture genre is generally based on the rule that students will mostly remain silent. This rule, which is the *sine qua non* of the lecture genre, creates a dilemma to the extent that it makes it difficult, if not impossible for the lecturer to know how each student has appropriated the lecture. When seminars follow lectures, they thus must operate as a device with which to encourage students to make their appropriation of lectures public. This allows lecturers to evaluate, and if necessary, correct the appropriations. That is to say, the seminar space plays a key role from the point of view of the control of the learning process. I would argue that this was the main function of seminars in Communicating Science. This reinterpretation is important because it enables one to understand that the lack of student protagonism in my post-lecture seminars was as much the result of my own failure to acquire the rules of realisation for seminars, as it was an oppositional strategy on the part of students. For students to remain silent in seminars, is to maintain control over their appropriations, at least in that context.

The above dynamic was very much the dynamic that prevailed in seminars that followed concept-oriented lectures. After such seminars, I asked students questions about the lecture, or invited them to comment,

and was frequently met with silence. Consciously or unconsciously-- or perhaps both-- students were resisting my efforts to encourage them to make public their appropriations of the concept-oriented lectures. This is in direct contrast to what happened after media analysis lectures. In the seminars the followed media analysis lectures, there was almost always more participation. However, when there *was* this greater participation, the 'opposite' problem arose: the enthusiastic responses reiterated poor commonsense discourses about the media. This was, I believe, the fundamental dilemma in my post-lecture seminars: the weakened framing invited greater participation, but it also meant that students were less likely to acquire the categories of the discourse being taught, at least in the first instance.

The *exercise* modality of seminars (cf. the Communicating Science Syllabus, in Appendix XI, for a description of this modality) was quite different from the post-lecture modality. The exercise modality involved the following phases: the producer of each video exercise was asked to come to the seminar prepared to present the plans for her/his production, in terms of subject, angle, a basic narrative structure, and a description of any relevant practical-technical considerations. After the presentation, which was also meant to inform the rest of the production team about the next producer's plans, the seminar group was invited to discuss the pros and cons of the proposal. This included 'helpful suggestions', but also a critique of assumptions about the audience, the topic, and so forth. The students then went to workshops, where, over a two-week period, they first shot and then edited the exercise with the workshop instructor. They then brought the completed piece to the seminar for analysis. The analysis involved the followingritual:

1. the piece was first shown
2. I then asked the producers if they wished to comment on the video, especially on any relevant technical-practical difficulties they faced which we should bear in mind during our analysis
3. I asked the whole group to engage in an analysis of the video (half of the seminar group had been involved in the production, and had seen the video, the other half, hadn't been involved and hadn't seen the video)
4. After this I offered my own analysis, which was itself meant to prompt further discussion.

This modality, especially in its "planning" phase, was an example of invisible pedagogy inasmuch as students were invited to 'take control' over a context which had nevertheless been determined beforehand by myself. I weakened the hierarchical boundaries between educator and educand to the extent that throughout the modality, I became a moderator/listener. Of course, it would be naive to accept that I was just a moderator/listener; I simply shifted the modality of control towards a less visible form. This less visible form involved steering students towards a discussion of aspects, issues which suggested an uncritical understanding on students part.

Having said the above, it is nevertheless true that the analysis was made more visible by the ritualization of the analytical sequencing. Once again, in retrospect it is clear to me that this form of sequencing served to reestablish boundaries between myself as lecturer, and the students as students. The ritualised nature of the sequencing acted to reinstate a sense of structure in the discussion, and thereby undoubtedly signalled my (controlling) presence.

In terms, finally, of the criterial rule, the whole modality was an example of invisible pedagogy inasmuch as the emphasis was not on attaining an individualised, and quantifiable performance with very discrete categories of achievement. Instead it was on developing a shared critical *disposition* vis-a-vis the process of science communication. The disposition which I hoped students would learn was a reflexive, and self-reflexive one with respect the discourses being produced, reproduced, or contested in the video exercises. In retrospect, it is clear that I taught this disposition not so much with a set of explicit criteria and systematic instructions (e.g. an actual methodology of analysis, which would be conducive to learning the disposition) as with 'observations' whose underlying assumptions were relatively implicit.

Just as post-lecture seminars were meant to control students' appropriation of lecture materials, exercise seminars were meant to control students' realisations and their interpretation of those realisations in workshops. To the extent that at times students failed to bring in plans for their exercises, and to the extent that they failed to engage in a dynamic of critical analysis, then this relation broke down. This too, can be interpreted as an oppositional learning form.

5.3 Workshops

The workshops were taught by instructors, and had a contact-time of two hours each week. Students attended a lecture, then a seminar, and then a two-hour workshop (in some cases, the workshop occurred the following day). In terms of contact-time, the workshops thus had the same duration as the lecture and the seminar, combined. But whereas lectures were plenary sessions, and seminars involved groups of about 12 students (or two workshop production groups), the workshops involved single production groups of about six students. This meant that the workshops, which were supposed to be subordinated in importance to lectures and seminars, actually involved pedagogic spaces which, in principle at least, allowed for a greater control over each individual's acquisition of categories.

In consultation with the senior instructor, I planned the overall structure of the workshops as follows: the first three weeks were devoted to teaching students to use S-VHS portapaks; the following weeks were used to produce ENG type exercises, on the basis of a rota system; and after each student had had a chance to produce one exercise, work began on a single "final production" per group, which was a short documentary or a long news report (cf. Syllabus in Appendix XI for a detailed description of structure of the exercises, and the final production.)

Analysing pedagogic practice in workshops is a task that is made complex thanks to the fact that it involved not only different modalities of teaching and learning *within* the workshop genre, but links with different modalities *across* curricular genres: I have already explained that although the 'hands on' work occurred in the workshops with the guidance of instructors, the planning and analysis ostensibly took place in part in the seminars. Although officially I was in charge of providing supervision for this last aspect, as the course progressed it became clear to me that the instructors too, were taking an active role in the planning process, albeit with very different criteria from my own.

This meant that the pedagogy of teaching-learning media production was a 'cleft' one. From my perspective, the emphasis was on teaching a critical disposition, rather than on the acquisition of specific skills. In this sense, my emphasis was on a relatively invisible pedagogy. Teaching students specific skills in media production was subservient to teaching students a more critical disposition vis-a-vis media production, and the communication of science, in general. From the perspective of the instructors, the emphasis was on teaching very concrete operations and

tasks, on the basis of more explicit forms of hierarchical relation, sequencing, and learning criteria. Their emphasis was on a relatively visible pedagogy.

I began to discuss the contradictory nature of the two discursive orientations in previous sections. The contradiction becomes more explicit when I identify and describe specific pedagogic modalities within the workshop genre. I will call these the **learning equipment** modality; the **field production** modality; and the **editing** modality.

The learning equipment modality occurred throughout the year, but especially in the first three weeks, and during editing sessions. This modality involved a highly visible pedagogy, in terms of hierarchy (with the instructor clearly established as the one who possessed technical knowledge), sequencing (with very discrete stages of learning as students were taught about each function of the equipment, in a discrete sequence), and criterial rules (from a technical-instrumental perspective, a relatively 'digital' *knows / doesn't know* how to use particular types of equipment). The one exception to this rule occurred with (the increasing number of) students who had some previous experience using video cameras, and thus considered themselves to be 'experts'. Here, a weakening of the hierarchical rules occurred which was analogous to the one analysed with respect to media studies.

The field production modality, which involved the actual shooting process in the field, was designed to give the instructor the chance to give a more contextualised form of instruction: instead of teaching students about video production techniques in decontextualized manners (e.g. in the studio, by means of an abstract exercise), I asked the instructor to teach students about the different techniques in the context of actual ENG situations, and on a 'need to know' basis. Had it been taught in this way, this modality would would have involved a more invisible modality of pedagogic practice, with the potential for a significant weakening of the hierarchical rules (the educator as part of the 'team', and no longer working in the more formal educational context of classes), and with a weakening of the sequencing rules (teaching and learning would be based on a far more fluid, and less rigidly sequenced acquisition of categories).

In retrospect, it is unsurprising that after the first few weeks, it was this aspect of the teaching that especially the senior instructor came to be the most strongly opposed to. This form of teaching, more than any other, entailed a weakening of framing and thereby a potential loss of control (or the perception of a loss of control). The senior instructor felt that teaching

and learning needed to occur in the studio, by means of the traditional in-studio exercises. For this reason, instead of accompanying students on shoots, the instructor simply sent students off to do their shoots on their own. As a result, the pedagogy broke down entirely within this modality. Students in effect had no instruction when they were shooting in the field.

This meant that most instruction imparted by the instructors (as distinct from that provided by myself as lecturer) occurred in the editing modality. To be sure, video editing is, in general, the key decision-making process in video production. It is the aspect of production where the narrative is assembled and given the form that will be seen by the viewer. During the editing sessions, the instructors assumed the role of producer, telling students what to do unless the students had a very precise idea of what they wanted to do, which was seldom the case. Here it is a matter of some interest whereas my own teaching was meant to elicit a contextualised and contextualising critical disposition (e.g. what meaning might this or that technique have in this or that context) the teaching and analysis carried out by the instructors on this level was based on a realist discourse, and on a scholastic model of grammar (Odin 1978): in effect, 'this is how it's done' or 'this is how it is done by professionals'.

It was statements like these which most clearly established a contradiction between my own orientation, and that of the instructors. Whereas my own theory of instruction was meant to question *techne* and *eidos*, the instructors' theory of instruction was meant to encourage students to *reproduce* the *eidos* of 'professional' science communication. However, I have already noted that I did not structure the module on the basis of explicit criteria for an alternative *eidos*, or indeed, on explicit criteria for the questioning of *eidos*. This, coupled to the strong temporal and spatial classification of lectures and seminars on the one hand, and workshops on the other, led to the reproduction of the very dualisms which I was keen to bring to an end.

6. Orientation to the market-place

As originally planned by the School of Media Studies, the orientation of the Communicating Science module was meant to be unambiguous: the module, like the modules in the School of Media Studies' main BA (Hons) in Media Studies, was designed to be structured along the lines of what I have identified as the autonomous modality of combined courses. In this sense,

the presence of media production in the module was designed to be something akin to an audio-visual teaching aid: it was meant to provide a space in which students could have a 'lived' experience of some of the production dynamics, and semiotic processes analysed by researchers.

This theory of instruction was a problematic one. First, it ignored the social fact that most students, many lecturers and indeed certain SCC aims and objectives interpreted the presence of media production in terms of the market-oriented modality: the teaching of media production as a way of preparing students to become 'effective science communicators'. To fail to address this conception-- as the 'media practice as teaching aid' theory of instruction did-- was to fail to engage with a significant, indeed perhaps *the* most significant source of contradiction within the degree.

As part of the above problem, the designers of the module overlooked the ambiguity generated by the insulation of workshop activities, from the rest of the teaching activities. This insulation, I have shown, recreated the very boundaries between 'theory and practice', 'skills and critical disposition' which a more critical orientation would have to contradict.

Lastly, this theory of instruction was a liberal one-- that is, a conservative one-- inasmuch as it privileged the teaching of media studies for its own sake, in a manner that paralleled the orientation of more traditional autonomous degrees like literature and history. Students were to be taught to 'think critically', with little or no regard for the question of employment, the transformation of employment conditions, and in general, the whole question of developing an alternative media politics.

The changes which I instituted in 1994/95 were meant to address at least some of these problems. However, my analysis suggests that instead I opened something of a Pandora's box where the module's orientation to work was concerned. Whatever its problems, the original 'autonomous' orientation was unambiguous in one respect: it did not attempt to link media studies with the development of a more critical praxis in media *production*. Indeed, the two discourses, media studies and media production, went their separate ways. The new (1994/95) structure changed this by effectively subordinating the teaching of media studies to the teaching of a critical media production disposition. This shift rendered ambiguous the orientation to work for three reasons: first, as I have already explained, I did not provide a sufficiently explicit, and coherent integrating principle with which to relate the teaching of the two discourses. As part of this problem, I did not propose alternative forms of science communication. And finally, I left intact the intra-modular boundaries, which I have explained were

carriers of the very forms of classification and framing which I wished to contest. I shall explain in chapter four that this ambiguity may have actually encouraged a reading of the module which reduced it to an uncritical, vocational orientation to science communication.

7. Conclusions

In this concluding section, as in the concluding section in chapter two, I will first provide a summary of the key findings of the chapter. Thereafter I will discuss the relation between the results of the analysis of pedagogic discourse on the level of the Communicating Science module, and on the level of the SCC course as a whole.

The following is a summary of the findings:

- the recontextualization of media studies and media production was initially governed by a collection code, and by a pedagogic discourse which framed media production as a 'teaching aid' for the acquisition of categories of media studies. The changes I introduced weakened the classification, and changed the pedagogic discourse. Despite this shift, there continued to be a strong classification of the different curricular genres (lecture, seminar, workshop), and this preserved a certain curricular space for separate, and contradictory pedagogic discourses in the workshops. Moreover, my own framing of the relation between media studies and media production lacked a sufficiently explicit, and coherent integrating principle. Indeed, in some ways it constituted a return to the framing that prevails in many vocational courses in media studies. That is, media studies as the 'theory' that implicitly 'guides' 'practice'. This meant that, despite the weakened classification, the module remained organised along the lines of a collection code.

- From the perspective of my own pedagogic discourse, the discourse of media studies was in effect transformed into a regulative discourse, and media production, into an instructional discourse. In turn, this framing meant that the (implicit) integrating principle contained fundamental contradictions in discursive orientation. These contradictions were not addressed or resolved by my teaching. Moreover, they were strengthened by efforts on the part of the senior

instructor to maintain the prior forms of classification, and thereby, the ability of instructors to teach on the basis of their own theories of instruction.

- Relative to the overall SCC degree, and especially to pedagogic practice in the science modules, the Communicating Science module was based on a relatively invisible pedagogy. However, there were considerable variations across internal curricular genres (lecture/seminar/workshops), and indeed, across modalities within those genres. Some aspects of the module were based on a pedagogy which was as visible as that of the science sectors of the module.

- Finally, there was considerable ambiguity in the module from the perspective of its orientation to the market-place. The fact that I was unable to resolve fundamental contradictions on the level of the regulative orientation of the module meant that the relation to the market-place was made ambiguous. Indeed, and as I shall explain in chapter four, many students interpreted the module's aims in terms of preparing them for professional science communication, that is,the reproduction of the *techne* and the *eidos* of traditional forms of science communication.

I will now discuss the implications of this pedagogic process, in relation to the process analysed in chapter two. I will link the dynamics within Communicating Science, to those in the broader SCC curriculum.

Here the first insight is that an analogy can be drawn between the dynamic of classification and framing on the SCC degree as a whole, and the dynamic within the Communicating Science module. In both cases, those of us teaching on the course attempted to frame categories in ways which interrupted the modalities of classification and framing-- the codes-- governing the pedagogic device, and thereby, pedagogic discourse. In both cases, there was an attempt to move from what I now would describe as a collection code, to an integrated code. But in both levels, a collection code continued to prevail. Indeed, in both levels, there was a process of 'internalisation' of the forms of classification promoted by the dominant pedagogic devices: in both SCC in general, and in Communicating Science in particular, categories which were previously entirely separate were brought together, but on the basis of a relation which preserved the same fundamental relations: pedagogic relations, social relations, and relations of

subjectivity.

The second aspect that I wish to consider with respect to the inter-relation is that the analysis I have conducted in this chapter reveals the extent to which my own teaching, as much as the overall logic of SCC curriculum, contributed to the marginalisation of critical media and cultural studies discourses within the SCC course. In chapter two, I explained that these discourses were neutralised by the following factors: the reduced space given to them in the curriculum as a whole; the degree of insulation between and indeed within the various strands; and finally the logic of 'oppositioning', which reduced the critical discourse of media and cultural studies to the status of the 'subjective', 'non-scientific' discourse which confirmed the 'objective', 'scientific' status of the science teaching. I believe this chapter has explained in detail how my teaching may have contributed particularly to this last dynamic of symbolic, subjective oppositioning.

The last aspect which I wish to consider concerns the instructor's role in this process. It is a matter of considerable interest that there was a certain continuity between the positivist orientation of scientists, and the realist orientation of the instructors, in the sense that both were intent on teaching students very visible categories for a depoliticised manipulation of forms (natural or symbolic). That is to say, there was a certain congruity between the orientation of science lecturers, on the one hand, and instructors, on the other. From this perspective, it is unsurprising that many staff members in the Faculty of Science inverted the hierarchy established within the School of Media Studies, and viewed the acquisition of visible categories of media production as the primary aim of the module. The effect of this was to further isolate the ideologically critical orientation of media and cultural studies within the SCC degree.

Notes

[1] In the University technicians with teaching functions were called "instructors". I will use this term from here onwards when referring to staff who are described as "technicians" in many other institutions.
[2] Though used mostly by the School of Media Studies, the Audio-Visual Services constituted an autonomous unit within the Faculty of Humanities. It was accountable directly to the Humanities dean.
[3] For critiques of this kind of discourse, see Williams (1983), and Ang (1990).
[4] See for example, Gardner & Young (1981); and Silverstone (1985, 1986).
[5] For an example of this type of approach, see Shortland & Gregory (1991).
[6] As I explained in the introduction of this thesis, the category of media studies, unless otherwise stated, is used in a very general sense and includes Film Studies, Television Studies, Image Studies, Media and Cultural Studies, and Communication Studies. It also includes courses which have a more traditional disciplinary approach: for example, the sociology of the media. The category of media production includes television, film, radio, the written press, and more recently, information technologies and multimedia. Clearly, the different titles mark what are at times important differences in instructional and regulative discourses. I would nevertheless argue that the *pedagogic modality* can be treated as a general one insofar as the different courses share the following, fundamental modality of classification: media production is classified as 'practice', and media studies is classified as 'theory'.
[7] A variety of 'primers' attempt to systematise these rules of good style. It is significant that not many of these primers are actually written by full-time practising producers; many are written by ex-producers devoted to education. For an example, see Millerson (1990).
[8] For a discussion of the inter-relationship of craft and industrialised discourses, see Bordwell *et al.* (1985).
[9] For reasons of space, I cannot engage in detailed discussion of this dynamic, or indeed of the transformation in this dynamic which has been brought about by the advent of what Mattelart & Mattelart (1990) have described as a post-fordist, *cybernetic* rationality.
[10] See for example, Arthurs (1989).
[11] I do not wish to propose that this continuum is a comprehensive,and exhaustive one; other, less common orientations exist which do not fit within this scheme, or which actually attempt to subvert it thanks to an awareness of its ideological nature. Moreover, I will suggest in this chapter that an instructor can use a different theory of instruction for structuring different aspects of teaching, i.e. a realist theory for editing, and an idealist theory for the overall production project.
[12] An investigation could be written about the tendency in Media and Cultural Studies to conflate interdisciplinarity, with a weak framing of academic discourse.
[13] It is worth noting that the social semiotic approach used in the course was quite different one from the one developed in this thesis; the approach was the one developed within the field of media and cultural studies by Hodge & Kress (1988).
[14] See for example, the work by Berger (1982).

[15] See R. Silverstone (1985; 1986). The work of G. Myers (1990) can be thought of as another exception, but its analysis draws more on the field of linguistics and the sociology of knowledge than it does from media studies.

[16] For a description of this form, see Burch's (1973; 1990) characterisation of what he calls the "Institutional Mode of Representation".

[17] See G. Bettetini (1984) for a fascinating analysis of the problem of the subject of enunciation in film and television.

[18] I propose that the above categories, and the overall theoretical approach that I am using, may be used to provide an account for the development of something like a general 'student genre' which may have many shared features across a variety of institutions, and courses.

[19] For example, the concept of text and the concept of discourse are in a dialectic relationship: one is the product of the other, but each reproduces the other. Moreover, and as with most non-positivist social theory, the shift from analysing empirically verifiable phenomena to phenomena of meaning (or 'meaningful phenomena') necessarily entails a loss of the bounded nature of knowledge which is regarded as a requirement for the positive sciences. Indeed, at this point, I would like to put forward the following hypothesis: pedagogic discourses which recontextualize technical (cf. Appendix I) instructional and regulative discourses are more likely to be realised by visible pedagogies; whereas pedagogic discourses which recontextualize critical-hermeneutic (or 'practical and emancipatory- cf. Appendix I) instructional and regulative discourses are more likely to be realised by relatively invisible pedagogies. If proven to be correct, the reasons for this might include the following: technical forms of reasoning tend to exhibit relatively strong and explicit forms of classification and framing. Hypothetico-deductive forms of reasoning operate by isolating variables, in order to attempt to establish causal relations between them. The success of the enterprise depends to a great extent on the capacity of the researcher to insulate categories from one another in a manner which leaves no doubt, or *seems* to leave no doubt, about what counts as x, as y, and as z. To be more precise, the research is based on a rhetoric that attempts to reduce and even conceal the interpretive nature of the production of knowledge. It is not gratuitous that the results of such research are frequently referred to in terms of "bodies of knowledge": the metaphor of body is a metaphor of boundary which works inasmuch as the epistemology employs categories which produce distinctly bounded knowledge. In contrast, interpretive or hermeneutic epistemological approaches (cf. Appendix I) weaken the overall strength of the classification and framing. This by signalling the interpretive nature of social research; and secondly by proposing categories which are either not so insulated from one another, or are insulated according to less empirical criteria.

Chapter 4

Student Receptions of Pedagogic Discourse

Introduction

In this chapter, I will complete the analytical phase of my research process. I will do so by turning from the level of "relations within" the pedagogic text-- what I have thus far described as the *construction* of pedagogic discourse-- to the level of "relations to"-- the *reception* of the pedagogic text.

I explained in chapter one that the analysis of "relations to" the pedagogic text is an important aspect of the analysis of pedagogic communication. As Bernstein (1990) notes, a particular pedagogic discourse may or may not be realised by a course, but also, what is taught is not necessarily what is learned. Any effort to explain pedagogic communication must thus also analyse the students' "relations to" the pedagogic text, and this is the task that I propose to engage in the present chapter.

Before I begin to do so, I wish to clarify some aspects of my methodology. The first aspect involves the identification of this methodology. Methodologies of reception research are commonly referred to as being "ethnographic". This, however, would not be an accurate description for my own research[1]. A full ethnographic investigation into students' reception would require the linking of learning practice to what Bernstein (1990) refers to as "local practice": peer relations, family relations, the shift from the family context to the educational context, and so forth, each of these studied over a period of time. Though relevant, such an investigation is beyond the scope of the present research. To be sure, Bernstein himself does not develop a methodology for an ethnographic account of the learning place. Investigations described in Bernstein (1990) and Bernstein (1996) show that Bernstein tends to structure research about the acquisition of pedagogic discourse in almost experimental ways. For example, in one case, Bernstein investigated the acquisition of codes by asking middle- and working class students to classify food items (cf. Bernstein 1981).

The research which I have carried out for this chapter is similar, though not identical to Bernstein's method of investigating "relations to". Having analysed the construction of pedagogic discourse on two different

levels, I now will investigate the extent to which students acquired the different modalities of classification and framing realised by pedagogic discourses on the level of the SCC course as a whole, and the Communicating Science module in particular. In keeping with the focus of the overall thesis, I will examine in greater detail the responses of the students who took the Communicating Science module in 1994/95.

The following are the dynamics of reception which I will be investigating: first, the manner in which students responded to the supposed presence, but actual absence, of an explicit integrating idea, and integrated code in the SCC curriculum. I explained in chapter two that various course documents suggested 'interdisciplinarity' as the integrating principle for an (integrated) curriculum. I have shown that there was no such integration; on the contrary, there was an unrecognised collection code in operation. How, then, if at all, did students respond to this code?

Second, I am also interested in investigating the extent to which students reproduced the modality of classification and framing science which is characteristic of the "Two Cultures" pedagogic device. I explained in chapter two that the pedagogic discourse on the level of the SCC course internalised this modality, and thereby privileged scientific discourses in several ways and levels. Did students acquire the same orientation to the relation between science and humanities categories?

Third, the manner in which students responded to ambiguities on the level of the course orientation to the marketplace. In chapter two, I explained that the course was ambiguous, if not contradictory where its orientation to the market was concerned. How, then, if at all, did students respond to this ambiguity?

Last but certainly not least, I am also interested in investigating the relation between the above dynamics, and responses to the Communicating Science module. I explained that collection code continued to structure the Communicating Science module, insulating media studies from media production, and producing ambiguity where the orientation to work in science communication was concerned. How, if at all, did the students respond to this code, and this orientation?

In all of the above questions, it is important to note that I have not assumed that there was a single modality of response to each of, or indeed all of the above questions. Moreover, although this is perhaps obvious, it is important to note that when I pose the question about students' relation to pedagogic discourse, this does not mean that I expected students to consciously appropriate something which they themselves recognised as

'pedagogic discourse'. The question is a theoretical one, and indeed a practical research problem which I had to resolve was to find a way of answering these questions by means of empirical research.

I have solved this problem as follows: I have used course evaluation forms, and student assessments as an *indirect* way of answering the above questions. Put somewhat more technically, I have decided to treat responses to course evaluations, and completed assignments as texts by means of which students, regarded as *empirical* pedagogic subjects, demonstrated indirectly whether or not they had acquired the modalities of classification and framing that were carried by the pedagogic discourse.

I have used the following texts for this purpose: first, student responses to an SCC course evaluation which course staff members and I carried out with first, second, and third year students. Second, student views during a staff-student meeting which took place during the the Fall of the 1995/96 year, and during which second year students (the first year students of the 1994/95 year) expressed a number of complaints about the SCC course. Third, student responses to a Communicating Science module evaluation which I carried out towards the end of the 1994/95 academic year. Finally, two different assessments which I required first-year students to complete for the Communicating Science module: a textual analysis, and the final video production.

In this chapter, I will analyse each of these texts. In section one, I will begin by describing SCC student recruitment practices. This will provide some general contextual information for the following analyses. In section two, I will analyse responses to the SCC evaluation forms. In section three, I will analyse student views during the staff-student 'crisis' meeting. In section four, I will investigate the responses to the Communicating Science evaluation form. Finally, in section five, I will analyse the two assessments.

1. SCC students: recruitment practice and some demographic markers

In 1994/95, admissions in SCC were handled almost exclusively by the Science Faculty[2]. A member of the science faculty decided what students took the course, in consultation with the Award leader, and with the central University administration. Decisions regarding student numbers were taken in relation to the University's internal recruitment targets which were in turn linked to State funding. In the U.K., the state penalised institutions with any significant deviation from published targets. This

explains why, although the course was originally designed to have a yearly intake of approximately 30 students, in the 1993/94 academic year this figure rose to 50. The sharp increase in the SCC course was used to help to compensate for shortfalls in recruitment in other degrees offered by the University, and thereby avoid the penalties[3].

That a degree as new and as different as SCC *did* recruit so many students can be attributed almost entirely to the popularity of media studies. Indeed, between 10 and 15% of SCC students initially attempted to gain entrance to the BA (Hons) in Media Studies offered by the School of Media Studies. Moreover, during each of the 1993-94, and 1994-95 academic years, between three and five SCC students (or approximately 10% of the student body) attempted to transfer into the Media Studies degree offered by the School of Media Studies. Many other students attempted to gain entrance in less demanding degrees in media, communication, and art and design degrees.

I explained in the introduction to this thesis that during the early 1990's, combined courses in media studies experienced a process of phenomenal growth. In this context, it is a matter of considerable interest that both the course leaflet (Appendix VII), and the university prospectus (Appendix V) represented the SCC degree in ways that began by describing employment prospects for degree holders in terms of media or science communication-related jobs. In effect, it would appear that the university used the media aspect of the SCC course to recruit students. To the extent that only a relatively small proportion of the degree was actually devoted to the study of the media, and that the degree had an ambiguous orientation to the science communication market, this constituted a highly problematic strategy. I will describe some effects of this strategy later in this chapter.

I will now describe the actual entry requirements for the course. These requirements were set by the original course designers, in consultation with the university requirements. The table below specifies the entry requirements for SCC, but also for two other courses for the sake of comparison: the BA (Hons) in Media Studies, and the BSc (Hons) in Applied Biological Sciences.

Degree	GCSE	A-level	Subjects	BTEC diploma	Access Courses	GNVQ Advncd	Scottish Highers
SCC	Maths, English (R)	12 pts	None Specified	4M	Yes	M	BCC
BSc Applied Biological Sciences	English, Maths (R), Biology, Physics,	8-12 pts	Biology (R) Chem. (R)	3M in Science Diploma	Yes	Pass-M in Science subject	CCC-BCC
Media Studies	English (R)	BBC	Media Studies (P) & Arts/Soc	3D & 3M	Yes kite-marked course	M in Media/ Comm C or above	ABBB

Table 1 Entrance requirements for three courses in the University

The comparison reveals firstly, the considerable differences in the strength of the framing of the entry requirements. Whereas the other two degrees specified at least some *field* requirements, SCC specified none. Second, the entry requirements from the perspective of A-level marks show that although requirements for SCC were higher than those for the Science degree, they were closer to those of the BSc than those of the BA(Hons) in Media Studies. A requirement of 12 points means that in principle at least, a student with three D's could gain admittance to the SCC degree. So here too, there was a weakening in framing, vis-a-vis the Media Studies degree.

To be sure, approximately half of the 1994/95 first-year students failed to be accepted in the college of their choice, and were thus classified by the UCAS (University and College Admissions Services) system as being "clearing" students, i.e. students whom are placed wherever there were available spaces. This was in stark contrast to the requirements for entry to the Media Studies course.

What about the student body itself? Table 2 provides a break down by year, sex, and age of the students taking the SCC course during the 1994/95 academic year.

Year	Total	17-18	19-20	21-22	23-24	25-30	31+
1	25 Female	3	15	4	1	1	1
	20 Male	2	13	3	0	0	2
2	25 Female	0	15	7	1	1	1
	23 Male	0	13	3	1	2	4
3	21 Female	0	7	10	2	0	2
	12 Male	0	5	7	0	0	0
Total	126	5	68	34	5	4	10

Table 2 Gender and age of students taking SCC, 1994/95

It might be expected that each year, despite a small number of so-called 'mature students', the average age of students would rise. Instead, there was a surprisingly small difference between the median age of year one, and year two students. This is explained by the fact that a substantial number of first year students took a year longer than usual to enter college, and this happened mostly because these students failed to achieve the entry requirements for the college of their choice. They thus decided either to take their A level exams again, or reapplied for courses the following year.

Earlier, I mentioned the category of 'mature' students. Each year approximately ten percent of students were accepted by the university, which were classified as 'mature' students: students entering college at the age of 21 or older. As can be seen in table 2, several of these students were 31 or older. The framing of entry requirements for these students was in some respects weaker than it was for other students: mature students could enter the degree simply by taking a designated access course in a local college of further education[4].

Where gender is concerned, it is significant that in all three years, there were more female than male students. In many science courses, there is the opposite tendency. The course did contradict this tendency, and thereby, at least one of the cruder discursive features of the pedagogic device: the tendency of this device to exclude female students, and thereby to reproduce what feminist scholars have described as the patriarchal ideology[5] of science, and of science institutions. (I will argue later in this chapter that the course nonetheless failed to address more fundamental issues of gender and ideology.)

Where social class, 'race' and ethnicity are concerned, the

information that I could obtain is less reliable than the above because it comes from a course-wide evaluation form that students were asked to answer just before the new academic year began in October, 1995. The questions were of the 'self-reported' type, and thus were not likely to be highly accurate, especially from the point of view of social class identification. (Appendix XIV has a description of the way in which these surveys were administered, as well as the results.) The results of the evaluation forms indicate that about two thirds of all SCC students were middle class, with about a third from working class backgrounds. The results also suggest that only about one percent of all of SCC students were from ethnic minorities. To the extent that the city in which the University is located is a multi-cultural metropolis, the extremely low percentage of Black, Asian and other ethnic groups suggests the reproduction in the course of a white, middle-class "bias". It is likely that the configuration of students also reflected another social division: what would appear to be a growing class distinction between so-called old, and new universities, with the so-called 'new' universities taking far more working class students than the 'old' universities, and with a greater proportion of upper-middle class, and high class students going to the 'old' universities.

2. The SCC course evaluation forms

I will begin my analysis of the "relations to" the pedagogic text by analysing the SCC course evaluation forms. I begin with these because the number of questions and topics which they explore provide the most general set of responses to various aspects of the SCC course. Before reading the analysis, the reader may wish to turn to Appendix XIV, which contains copies of the evaluation forms, and which describes the context in which the evaluation forms were developed as well as some problems which occurred in their administration.

The forms asked students to evaluate the *previous* year's experiences. In this sense, they can be regarded as evaluations of the first, second, and third years, even though students completing the forms were about to begin their second year, third year, or post-graduation careers, respectively. For this reason, I will refer throughout this chapter to students who were about to begin their second year as first-year students (Y1); students who were about to begin the third year, as second-year students (Y2); and to students who were about to begin their careers (or

lives after the university) as third-year students (Y3). Moreover, when referring to the different evaluation forms and their questions, I will use the following system of abbreviation: Y1, Y2 or Y3 will identify the year involved (following the same principle as above); and Q(X) will identify the question involved. For example, Y1:Q7 signifies form evaluating year one (students beginning their second year), question number seven. Since I am particularly concerned with analysing pedagogic communication in the context of the first-year Communicating Science module, my analysis will centre on first-year (Y1) responses. However, towards the end of this section I will comment on similarities and differences with second-year students. As I explain in Appendix XIV, I will not refer to the Y3 evaluation forms because the sample was too small, and was not anonymous.

Before beginning the actual analysis, I wish to make three important observations. The first is that any evaluation form necessarily shapes the responses of its respondents. In this sense, and contrary to the logic of positivism, the problem is not to avoid framing responses, but rather, to try to understand how a question frames responses. But even here, the textual nature of the process and thereby its interpretive nature mean that the researcher can never be completely aware of how her/his questions may have framed responses[6]. This is point is valid not just for these general course evaluations, but to all other evaluations which I will be referring to in this chapter.

The second observation concerns the qualitative nature of my analysis. I will not attempt to engage in a statistical analysis of the correlation between various answers, or indeed attempt to generate a model which is capable of predicting responses. Instead, the emphasis will be on using the students' responses to answer the research questions which I posed earlier in this chapter.

The last observation concerns the scope of my analysis of responses to the evaluation forms. Each evaluation form contained approximately one hundred questions, some of which contained several categories of response. Although the surveys contain a wealth of information, I will not be able to cover all, or even most of the categories which they explore. To be sure, it is important to remind the reader that the evaluation forms were not designed for the purposes of this thesis. They were designed to provide the SCC teaching team with answers to the many questions which this team desired to investigate in relation to the student body.

I will begin with an analysis of responses to closed questions. Responses to the first of the *general* questionnaire questions (cf. Y1,

Appendix XIV), which asked students how satisfied they were with the overall course, suggested that most students were quite satisfied with the course, found it quite enjoyable, quite interesting, and quite useful (Y1:Q1-6). The results to these first questions suggest student satisfaction with the course. Of course, the term 'satisfaction', like any other in a closed question, is open to interpretation: what does it mean for the respondent and for the analyst that a student is 'quite satisfied'? Indeed, an analysis of responses to other closed questions in the surveys, which can be taken as indirect evidence of students' satisfaction with the course, reveals a significant contradiction: approximately 60% of first-year students said that they either wouldn't choose the SCC course again, or were unsure whether they would choose it again (Y1: Q7). This more negative orientation was echoed by other responses: there was a high level of self-reported absenteeism in year one, and one of the most common justifications given by students for missing class was boredom with the course (Y1: Q33). Moreover, approximately 80% of year one students spent 10 hours or less studying for the course, above and beyond class contact time. Of these, 40% reported spending five hours or less (Y1: Q30). (Year one students nonetheless suggested in follow-up questions that they should have devoted more time to the course [Y1: Q32]). I propose that when taken together, the above results either contradict the apparently positive orientation of most students, or force the analyst to produce a more complex interpretation of the first answers.

General questions both shape, and assume the possibility of, a totalizing response to the course. However, the surveys included more specific closed questions, which asked students to evaluate different modules, and different aspects of the course. An analysis of the differentiated questions reveals the following trend. Responses to questions asking students to rate how enjoyable, difficult, and interesting they found the individual modules and subjects taught within the modules suggest a negative orientation towards most science modules/subjects (cf. Y1:Q8-10; Q14-16, but especially towards the 'singular' sciences (as opposed to the regionalized sciences); and a positive orientation towards the humanities modules/subjects, but especially to media production subjects. Indeed, it was the maths aspect, as taught in the CNGM module (Computing, Numerical, and Graphical Methods), that was deemed by most students to be the least enjoyable, the most difficult, and the least interesting (cf. Y1:Q8-10; and Q14-16). And it was the "Issues" module, which was also taught by science lecturers, but which was taught as a regionalized

discourse, which received the most positive evaluation amongst the science modules. (The Issues module was taught as an *applied* science, bringing together two or more disciplines, to analyse concrete, and for the most part recognisable and in this sense *visible* issues: exposure to sun and skin cancer, environmental issues, and so forth.)

In contrast to the responses to the singular sciences, a majority of first-year students assigned a very high, and very positive value to the media production aspect of the course. This was expressed in several ways. The subject heading 'media production' received the highest positive ratings for any subject in the course (cf. Y1:Q14-16). Moreover, a majority of responses to questions asking students what subjects should be given more or less time suggested that students wanted more media courses, and less science (cf. Y1:Q19 & 20). The 'hypervaluation' of the media may have been linked to the fact that the overwhelming majority of students who had given some thought to what they wanted to do once they graduated from the course suggested that they would like to work in some media-related job (cf. Y1:Q101).

I will now analyse the responses to the last four questions (Y1:102-105), which were constructed on the basis of a more open format. I will begin with Y1:Q102, which asked students to describe the aims and objectives of SCC. The answers to this question can be classified into the following groups:

14 students described the aims and objectives as learning how to communicate science. The following are some examples of these answers:

> "To equip people to communicate science clearly, with experience how to communicate practically."
>
> "To provide us with the ability to communicate science in a competant [sic] manner using various mediums of communication"
>
> "It gives students the ability to understand the basics of some elements in science so that they could be capable of reporting + explaining these elements to the general public"
>
> "To make SCC students science literate and to give them the ability to communicate this science to people who may not be science literate."

Seven students described the aims and objectives in ways which alluded either to the "Two Cultures" ideal of integrating science and the humanities, or to the liberal ideal of getting a 'well rounded' education:

"Giving people a broad education and, therefore, an understanding of a wide range of issues relating to science in one way or another"

"Covering all science + media issues"

"I would argue that the aims of SCC would be to incorporate the knowledge of science into society, thus making it a less daunting subject."

"To develop an understanding in all departments of science, past and present and to establish links and mergers with these into cultural and social subjects within society, and their applications.

Five students left the space blank, and two assumed that the question was asking them not to describe, but to rate the aims and objectives. One student said that the aims and objectives didn't seem to be clear: "They don't seem to be that clear. -- the link between St. Andrews [the humanities campus] + Central [the Science campus] is not at all clear".

Where the questions about the most positive, and most negative aspects of the SCC course were concerned (Y1:103 & 104), the students responded as follows: 12 students mentioned the media production, the science communication, or the media analysis as being the most positive. The following are some examples of these responses:

"The media and literature studies are more positive aspects than the science studies."

"The media presentation."

"The media side"

"Video production"

"Links between science + the media -- even if it is a BA!"

"The way in which the course makes the students more aware of the role of the media."

"Media + production at St. Andrews [the Humanities campus]"

Six students responded by suggesting that the most positive aspect of the course was its "variety", or the "broad subject range". This was a response that also emerged during oral evaluations of the course, and in the written evaluations of the Communicating Science module (cf. section 4, below).

Conversely, the aspects which were most frequently described as the

most negative aspects of the course were the singular science aspects--maths, physics, and the CNGM module in particular. 13 students described these as being the most negative aspects. The following are some examples of these responses:

> "The mathematical/physics side -- only because they are not my speciality."
>
> "Too much complex maths, science-- not explained fully enough."
>
> "Occasionally, we seem to go just slightly to [sic] scientific and away from the social implications in some modules (MPLP) in particular."
>
> "Physics + CNGM to [sic] advanced for people with no science back ground [sic]"
>
> "The large amounts of sciences"
>
> "The things like advanced maths and physics because the majority of people on the course were not expecting such involvement with these subjects i.e.. I gave up physics when I was 13."
>
> "Its [sic] a BA degree and media + science should be given equal amount [sic] of time."

Nine students responded in ways which can be linked directly or indirectly to the process which I described in chapter two as the absence of a clear integrating principle, and the lack of communication generated by the collection code:

> [the most negative aspect is] "The fact that the course seems a little bit disorganised at times, but being new course [sic], it has to be understood and accepted."
>
> "Difficulties in communication between the science & humanities lecturers. [and below this line] It's hard to describe to others what the course is!"
>
> "Huge variety of subjects can be confusing"
>
> "Sometimes people perceive a lack of overall direction"

Three students left the question blank, and two said that there were no very negative aspects in the course.

Students responded to the most weakly framed (the most open) question (Y1:105), which asked students to provide "any additional

feedback which you feel is important", as follows: 19 students left this question blank. Those who did respond, responded almost exclusively with negative responses. A variety of aspects were mentioned; however, six of the responses could be directly or indirectly linked to disillusionment with the course's failure to develop a strong media strand: there was too much science and too little media; and the course was sold as a media course, which was in fact not the case. Along with this response, there were some comments about pacing in general ("I feel the lecturers sped through topics", "Sometimes I've felt that we're trying to do too many modules with not enough detail"), the lack of a clear integrating idea ("make sure people work towards a common aim"), and about problems in the criteria of assignments ("Sometimes I don't fully understand what is needed in an assignment re what we are requested to do."). Only one comment was explicitly positive: when asked to give any additional feedback, one student said

> Nothing I haven't already mentioned springs to mind, at the half way point of the 1st yr I would have said the science, culture and communication didn't seem to interconnect, but this changed and the links formed as the year progressed. This I would point out to any 1st year student perhaps feeling slightly confused or demoralised about S.C.C.

Given the loss of key pages in several of the evaluation forms, it is not possible to examine the evaluations forms in a way that attempts to link answers systematically to class, and educational background. It is, however, possible to analyse the responses in relation to gender. Here my analysis reveals the following trend: in general, female students tended to be more critical of the course, and especially of the singular science aspects, than were male students. *Proportionally*, far more men found the overall SCC course to be enjoyable than did women (Y1:Q3); far more women found the course to be very difficult than did men (Y1:Q4); far more men found the course to be very interesting than did women (Y1:Q5); and again far more men would pick the course again if given the chance (Y1:Q7). A similar pattern could be found with respect to evaluation of the science track of DSCC, and of the rest of science modules, barring the 'Issues' module. Men tended to express a 'superlative' positive orientation towards the science aspects of the course that was out of proportion to the male:female ratio, and vice-versa: women tended to express a 'superlative' *negative* orientation towards science that was also out of proportion to the female:male ratio (cf. Y1:Q8-10, and Q14 & Q16). Finally, in the last open questions, after considering the overall proportion of women to men in the

course, far more women expressed discontent with the science aspects than did men (cf. Y1:104), and far more women were willing to provide negative feedback in the question asking for any other feedback (cf. Y1:105).

Before making some concluding comments for this section, I will compare and contrast these responses to the responses of second-year (Y2) students. How do these compare to first-year student responses? There are some similarities, as well as some differences. Like first-year students, most second-year students answered that they found that the SCC course was quite enjoyable, quite interesting, and quite useful (Y2:Q1-6). But like year one students, a majority of second-year students either wouldn't pick SCC again, or were unsure about this point (Y2: Q7). Year two students did not spend much more time studying than Year one students, with 66% spending 10 hours or less a week on their course work (Y2: Q30). There was also a high level of absenteeism amongst year two students, and again, one of the most common justifications given by students for missing class was boredom with the course (Y2: Q33). Second year student responses also mirrored first year student responses in that the most common suggestion regarding what modules/subjects should be dropped and which ones should be increased was that there should be less science, and more media production (Y2:Q20-22). Along a similar vein, a significant, though somewhat reduced proportion of second year students also aspired to work in the media after graduating (Y2: Q101). Perhaps most importantly, a substantial number of students suggested that the most negative aspect of the course was its "disorganisation" and/or and the lack of integration or communication between the two faculties (ten students) (Y2:104). Indeed, the tone of these responses was sharper among second year students than it was in first year students.

So much for the similarities in the responses. What, then, were the differences? In module by module, and subject by subject descriptions (Y2:11-13 & 17-19) second-year students did not express as negative an orientation towards singular science subjects as did first-year students. Indeed, the very negative evaluation which most year one students expressed towards the CNGM module was expressed by most year two students towards the Reception of Science module (which I taught, along with Communicating Science). As one student put it, the Reception of Science module made "a mountain out of a molehill". Many students were also critical of the Science Journalism module, which they felt needed to be reorganised[7] . Finally, the gender difference noted with respect to year one

responses was less evident in second year student responses.

When comparing the two sets of responses, it is nonetheless important to note that the curricular structure of the second year was more 'balanced': the presence of a second media/cultural module (Science Journalism) significantly altered the Science/Humanities balance by increasing the curricular space devoted to humanities modules, and (concomitantly) *decreasing* the space devoted not just to science modules, but particularly, to non-regionalized science modules.

What, then, can we can conclude from the results of the SCC evaluation, where first-year students are concerned? The first conclusion is that most students experienced a strong ambiguity with respect to the course; even as many answered the general questions in a relatively positive manner, many suggested in more specific questions that they had doubts about the course, and that their day to day participation in the course was relatively low. The second conclusion is that most students tended to have a strongly negative orientation towards the modules that required them to engage with the most abstract, 'singular' disciplines or interdisciplines. This was in marked contrast to their highly positive orientation towards regionalized modules/subjects organised along the lines of relatively *visible* criterial rules (e.g. 'Issues' and media production).

This polarity constitutes a modality of framing in its own right. It was a modality reemerged even more strongly amongst first-year students the following year (cf. section three, below). A key aspect of the modality of framing was not just an oppositional, but also a *vocationalising* evaluation of singular science modules/subjects, and media production subjects. As part of this process, it is significant that many students 'left out' the historical component of the course. Indeed, many assumed that the science communication, *and not the DSCC strand,* was at the heart of the degree. This constituted a direct contradiction of the discourse contained in the para-curricular markers, which suggested that DSCC was the 'core' or 'spine' of the degree. Finally, from the perspective of the differentiation of responses, the most important finding of the evaluation form was the gendering of responses especially where the singular science subjects were concerned. This suggests that, whatever gains the course made on the level of recruitment, it continued to be dogged by the presence of a patriarchal discourse, at least on the level of responses to the course.

3. The staff-student meeting

As I explained earlier in this thesis, I decided to focus my analysis on the construction and reception of pedagogic discourse in the Communicating Science module, during the 1994/95 year. However, an event occurred in the Autumn of 1995/96, which had direct relevance to my research. Second-year students (Y1 students during the period being researched) experienced what can be described as a crisis in confidence in the SCC course. Their feelings of dissatisfaction, frustration, and even anger were first expressed by student representatives during the Autumn Award Management Committee (AMC) meeting. During this meeting, student representatives suggested that several students were considering dropping out of the course, and that there was widespread dissatisfaction with several aspects of the course. The course leaders decided to organise a special staff-student meeting, in order to give students a chance to express the reasons for their dissatisfaction, and to give staff the opportunity to respond to any criticisms and/or problems. Appendix XVI contains a description of the context, some relevant primary documents which framed the session, as well as notes which I took during the meeting.

Before analysing the proceedings, I wish to make two observations with respect to this meeting. The first is that at the time when the 'crisis' occurred, I was on a half-year research sabbatical, and thus was not teaching any of the SCC modules. The second observation is that, although the meeting was extra-ordinary in the sense that it was not one of the regular administrative meetings (like the AMC meetings), this was not the first time that SCC students had a crisis in confidence, or indeed that a special meeting was organised to give students a chance to express their dissatisfaction. Since the course took in its first cohort of students in 1992, staff members were forced to organise similar 'crisis' meetings virtually every year (one exception was the 1994/95 year). Each time, the meetings were triggered by strong student complaints about the course as a whole, and about particular modules.

The first item in Appendix XVI is the 'provisional agenda' which the award leaders set up to structure the staff-student meetings. Students were asked to meet first in "focus groups" of six students "to discuss issues raised about the course". Staff met in a "parallel group of their own". After a break, students were asked to reassemble into the groups, but this time with one or more staff members present at each "to see how points raised in first session might be addressed." This was, lastly, to be followed by a

plenary session (all staff and students), in which all complaints would be shared and after which a plan of action would be drawn up by staff in response to student views.

This structuring of the meeting was clearly one which attempted to control student responses. That is to say, following this strongly mediated scheme, and not having students express their complaints more directly, may have led to the suppression of at least some complaints, and the realisation of others in ways which reduced their subversive potential. The initial talk given by the award leader, and the breaking down of students into small group which were mediated by lecturers are likely to have had a particularly strong framing effect. Despite this, it is clear that students were nevertheless given the opportunity to, and indeed *did* express strong complaints during the plenary session that followed.

The following is a summary of the views expressed during the plenary meeting which followed the small group meetings.

All of the groups suggested, either directly and indirectly, that there was too little media production in the course. In some cases, this was contrasted to the presence of too much science, and/or too much history. Indeed, one group suggested that the course was too 'backward looking'.

All groups criticised either the lack of communication between lecturers; the lack of a 'link' between the two faculties; the lack of a clearly perceived relevance of one or more courses; or the lack of a clear *identity* for the course, and thereby, amongst the students themselves.

Four out of the five groups (G1,G2,G4,G5) made statements which suggested, directly or indirectly, that students were concerned with the degree's relation to work: the students were worried about the degree's relevance to jobs; there should be more work experience as part of the course; the course should establish more contacts with potential employers; the course should teach more skills; the degree should invite more media producers; it was difficult to describe the degree to potential employers (this last point can be linked to the question of identity).

In this context, it is significant that the second-year modules in the Science Communication *strand* were the objects of particularly strong criticism, albeit each for different reasons. Four of the five groups criticised the second-year Science Journalism because it had dropped the DTP element which it had in 1993/94, and because it was too focused on 'traditional' broadsheet journalism. Three of the groups criticised the Reception of Science module because its objectives were not clear, and because they did not understand what the relevance of this module was.

How do these responses relate to the questions I posed at the beginning of this chapter?. The entire 'crisis', and indeed most of the different group's complaints, can be linked to the absence of a coherent and visible integrating principle in the degree, and along with this, to the degree's ambiguity with respect to the marketplace. Students were responding to the lack of integration and communication generated by the collection code. Moreover, they were responding on the basis of the expectation that the course was, or *ought to be*, not just vocational, but entirely market-oriented (though interestingly enough, not one student used these particular terms. This suggests that for most students, a market-led orientation was not an 'option' : it was the only possible orientation).

I now wish to engage in a more detailed analysis of one group's proposal, that the course should teach the science in the Central campus, and then teach students how to communicate it in the St. Andrews campus. As the student representative for this group put it, "We should learn science here at Central [at the Science campus], go down to St. Andrews [the humanities campus], and communicate it there." This proposal provoked widespread agreement amongst other students attending the session. I believe that it was highly significant for a number of reasons.

First, the statement was in effect an effort to propose an integrating idea that filled the void created by the collection code which I analysed in chapter two. Second, the proposal illustrated the vocationalising orientation which was the dominant orientation amongst SCC students. The proposal took for granted that students ought to be taught to teach science communication. Third, the proposal classified and framed the various discourses which make up the course in a manner merits a close analysis.

On one level, the proposal clearly constituted a transformation of the course's modality of classification. It excluded the history and literature elements of the humanities degree-- all there was, was science, and science communication. In this sense, the response echoed the modality of classification which I noted in section two, above. In addition, it attributed a certain parity to each of the classified elements (science and science communication) and thereby transformed, or appeared to transform, the degree's framing modality. In contrast to the curricular code, which framed the teaching of science in a manner which implicitly established the superiority of this discourse (cf. chapter two), and which failed to explicitly relate this aspect to the discourses of media and cultural studies, the student's statement suggested that the two categories were equally

important, and in close relation. From this perspective, the classification and framing in the statement transformed and simplified the three-strand classification at work on the level of the curriculum.

However, it would be a mistake to deduce from the above that this student, and others who agreed with this view, were *contradicting* the dominant modality of classification and framing. I propose that on a more fundamental level, the proposed integrating idea *did* reproduce the dominant coding orientation. This in spatial, temporal and logical terms. In spatial terms, the student's integrating idea clearly treated the different *campuses* as metaphors for the two 'sides' of a divide: the Central campus as representing science, and the St. Andrews campus as representing humanities. The same classification and framing was reproduced in temporal terms. This to the extent that the integrating idea suggested that science should be learned first, *and then* students should learn how to communicate it: this established not only a narrative of temporal progression, but also an implicit hierarchy: students should learn *first* about science, *and then* to communicate it.

To suggest that students should learn science first, and then to communicate it implies an instrumental, and linear model of science communication, and indeed, an instrumental and linear model of the pedagogy of science communication. Science communication as the delivery of information by means of a channel; teaching and learning about science communication as teaching and learning the information, and then the means with which to control the delivery of this information. The underlying assumption was that science constituted not only an unproblematic entity, but one which could and *ought* to be communicated. The normativeness of this 'ought' was the same normativeness of many if not most of the lecturers on the course, a normativeness which echoed Royal Society's (1985) regulative discourse, according to which science should be treated as a privileged form of knowledge which 'the public' could and *should* benefit from.

I now wish to analyse in more detail the students' criticisms of modules in the science communication *strand*. To begin with, it is interesting that the students' criticism of the science journalism module suggested that the they did not classify written journalism as constituting 'true' media production. In this context, to lose the unit on DTP, offered the previous year in the second half of the module, was to lose the last full, 'future facing' media production aspect in a course which most students felt had 'too little media' and 'too much science'.

A similar orientation applied to the evaluation of the Reception of Science module. Whatever the problems in the actual delivery of the module in that year[7], it was clear that once again, students were having difficulties understanding the place and role of a module devoted to audience research, and to the popular understandings of science communication. In this sense, their response to this module was not entirely dissimilar from their response to the first-year CNGM (computing, numerical, and graphical methods) module. What was the purpose of such a 'theoretical' module, if students were to become science communicators? Again, this response suggested a vocationalising tendency which contradicted the autonomous orientation which had led the founding practitioners to design and to include the Reception of Science module in the first place.

To conclude this section: the texts generated in the staff-student meeting can be regarded as a radicalisation of the framing trends noted in the responses to the SCC evaluation forms. Although in this case there was no explicit opposition to the science categories, there was strong opposition to the lack of a more explicit vocational, and market-led orientation in the degree. Moreover, there was a marked discontent as a result of the lack of a clear integrating principle for the degree. In the absence of such a principle, at least some of the students were, in effect, proposing *their own* integrating principle. This principle reproduced the fundamental modality of framing in the SCC degree, even as it transformed it by omitting the historical discourses of the degree.

4. The Communicating Science module evaluations

In this and in the following sections, I will analyse student responses in the context of the Communicating Science module. Whilst the same general questions will be guiding my enquiry, I will be looking more specifically for clues to students' receptions of pedagogic discourse in the Communicating Science module, as distinct from, but at the same time as related to, pedagogic discourse on the level of the SCC curriculum.

The first text that I will analyse is a module evaluation form which students were asked to complete in the Communicating Science module during the last week of classes of the 1994/95 academic year (cf. Appendix XV). The evaluation form asked students to explain what were the "most valuable" and "least satisfying" aspects of the Communicating Science module; what were the "most valuable" and "least satisfying" aspects of

the SCC course as a whole; and finally to evaluate numerically both levels on a scale of 0-10, where 0 was 'very bad' and 10 was 'very good'[8]. Appendix XV contains copies of each student's response to the evaluation, as well as a description of the circumstances in which the module evaluation forms were completed.

I will begin by describing the responses to the question which asked students to evaluate the module and the course on a scale of zero to ten. Overall, both levels were evaluated quite positively by most students. Only two students on the level of Communicating Science, and two students on the level of the SCC course, rated each category with a four or less. The mode for Communicating Science was eight (nine students), and the mode for the SCC course was nine (six students). Scores for Communicating Science were bunched around the scores of seven and eight, while scores for SCC were more or less evenly grouped around the scores of six, seven, eight, and nine. The sum of each evaluation shows that students evaluated the SCC course slightly more positively than the Communicating Science module (155 vs. 150). This suggests a more positive evaluation of the SCC course as a whole than might be expected given the following year's "crisis".

I will now turn to the open questions. The responses to the question about the 'most valuable' aspect of the module can be grouped as follows: eleven students said that the most valuable aspect was learning a 'new language' or 'approach' to the media. Some of the students phrased this in ways which suggested they valued becoming more critical with respect to science communication. Ten students responded that the most positive aspect was the media production (six students suggested that *both* of these aspects were the most valuable; seven students suggested that the media studies-related aspect only was the most valuable; and four suggested that the media production aspect only was the most valuable.) Other responses included the well structured and organised nature of the module (2); the aspects involving group work (2); gaining a better understanding of the 'public perception of science' (1); and the lectures and seminars (presumably in opposition to the media production workshops (1)).

The responses to the 'least satisfying' aspects of the module can be grouped as follows: five students referred to the 'jargon' or the the language used in the course (especially in the lectures); four students referred to the lectures; and three students referred to the workshop exercises. Other responses included the lack of a 'theory-practice' relationship (2); too little media production (2); and too little contact time (2).

The responses to the 'most valuable' aspects of the SCC course as a

whole, can be grouped as follows: six students suggested that the most valuable aspect of the SCC course as a whole was its 'variety' or the diversity of its subjects. Five students suggested that the most valuable aspect was gaining a new understanding, or insight to science; and three students suggested that the most valuable aspect was the media, or science communication aspect of the course. Other responses included the wide choice of careers made possible by the degree (1); the Humanities aspect (1); and the "broad education" provided (1).

The responses to the 'least satisfying' aspects of the SCC course can be grouped as follows: the majority of responses--15-- pointed to the 'singular' sciences (especially physics and maths). This response occurred directly (e.g. mentioning maths) or indirectly, by singling out the modules associated with the teaching of these: CNGM, and MPLP. Six students referred to the lack of integration, or lack of communication between lecturers in different subjects. Four students mentioned problems to do with the pacing of assignments. Other responses included the lack of theory-practice relations (1); too many lecturers on the DSCC module, making it 'bitty' (1); and too little media production (1).

Having classified the different responses, I now will attempt to relate them to the questions I posed at the beginning of this chapter.

To begin with, it is worth noting that, at first glance, a substantial number of the respondents evaluated in a positive way aspects of the module which could be related to the acquisition of the discourse of media studies. Eleven out of 21 respondents suggested that the acquisition of the 'new language' [of Media Studies] was the 'most valuable' aspect of the course. As one student put it,

> I watch [TV] and all the way through it I sit and critique-- it stops you accepting all the implicit messages.

However, this interpretation must be contextualised in a number of ways. First, not one student actually identified the approach -- Media Studies, or Media and Cultural Studies-- by its name. Second, the total number of respondents constituted slightly less than half of the students actually taking the course. To the extent that these students were probably the most 'motivated' students, then the possibility exists, indeed it is likely that a larger sample would have revealed a smaller proportion of students giving high marks to the Media Studies aspect of the course.

In addition, some of the students who evaluated positively the 'new language' or new approach, also suggested a strongly empiricist frame

when they criticised that very language as a superfluous 'jargon':

> I feel some of the jargon hasn't been explain [sic] in a way that would help one understand what it mean [sic]. I would have though [sic] a sentence and a few examples would do but instead we get pages + pages of no straight answer.

Indeed, although many students appreciated having their "eyes opened" (as one student put it) by the course, the status of the academic discourse was framed from the perspective of a positivist conception of social science. As one student put it in the evaluation form,

> ... the lectures are often about opinions as well as facts and this can cause trouble as we all have different opinions.

Responses like these, and indeed others which I will analyse in section five (below) suggest that at least some of the students who appeared to have acquired the rules of recognition and realisation of media studies, had in fact *not* done so. They *had* begun to treat media texts as representations, but this from a *positivist* perspective: as instances of 'bias' which, given a greater professionalism or a different approach, would produce a true replica of reality. In this fundamental sense, they had not acquired the category of representation.

In chapter three, I suggested that my teaching tended to be structured around concept-driven, or media analysis modalities. In both oral and written evaluations, a number of students criticised lecturers based on the first modality for being "too full of jargon" or for being "long winded". It would appear in this sense that the concept-driven modality, aside from being relatively monotonously delivered, triggered particularly strong empiricist discourses amongst many students who considered the 'jargon' to be unnecessary.

Some responses in the evaluation forms seem to confirm a dynamic which my earlier analysis of the construction of pedagogic discourse referred to: I explained in chapter three that traditional or 'visible' pedagogies tend to be structured by a narrative of progression that implicitly promises that, eventually, the nature of the fundamental mysteries will be revealed. I noted that my own teaching inverted this narrative order by *beginning* with the moment of 'revelation', as constituted by an explanation of the Foucaultian concept of discourse. The following responses suggest that as a result, at least some students 'lost' the thread of the narrative:

> It can be overwhelming trying to understand and see the relevance of the concepts that are being introduced for the first time.

and

> I wish I could start again with the module at day one-- having been here for a year, I now feel I would understand and appreciate what's being taught a lot more.

Although I only found this response in two evaluation forms, during the oral evaluation sessions that followed the completion of the written evaluation, many students suggested this experience of the temporal organisation of the course: they (felt they) had only begun to grasp the significance of the concepts towards the end of the course, long after the concepts had been introduced.

The last aspect of the responses which I wish to analyse concerns students' appropriation of the theory-practice relation in the module. Most students failed to perceive any problems in the relation between the media studies and the media production discourses. They did not consciously perceive the problem of the lack of a coherent relation between the teaching of media studies and media production. If there was any problem on the level of Communicating Science, it was that there was too much 'jargon' in the teaching of media studies, and too little time for the teaching of media production.

Although the majority of students failed to perceive the absence of a coherent relation between media studies and media production, a small group of students did perceive that there was little or no relation between the lectures, and the media production work. These students framed the problem as follows:

> ... it was difficult relating the information given [in the lectures] to the workshops. This made the module feel as though it was split into two sections as opposed to the information given in lectures complimenting the practical work done in the workshops.

Another student said

> I found it irritating that there appeared to be two separate divisions of teaching [the student initially had written 'authority' instead of teaching]. This did affect group work where at times students had no direction. I dare say: P.S. Nils-- too much theory. C. -- [the senior instructor] too much cunning know-how."

Or as another student put it, the least satisfying aspect of the module was "Not being sure how the theory fits into the practice".

Why was it that so few students were aware of, concerned with, or able to articulate the discontinuity, and indeed the contradiction between media studies, and media production? It would appear that for many of the students, there was no problem in the relation quite simply because the theory-practice relation was not an issue for them, *at least where the relation between media studies and media production was concerned.* This qualification is important because many of these students did feel that there should be a coherent theory-practice relation between science, and science communication, albeit along the lines of a linear conception of science communication (cf. section 3, above). In this sense, it would appear that the problem was perceived *not* on the level of Communicating Science, but instead, on the level of the SCC course as a whole, where many students expressed a desire for a more vocational orientation to science communication. Implicitly, the call for "learning science and then how to communicate it" excluded *both* the historical dimension of the course, *and the media studies* discourse.

This suggests that, even by the end of the first year, most students assumed that teaching and learning about science communication entailed teaching and learning a market-oriented *eidos* for science communication: that is, they assumed that they would be taught how to communicate science as professional science communicators did. As I explained in chapter three, in general, the epistemology of this conception is non-reflexive, and non-self-reflexive. Given this frame, it seems likely that most students did not perceive a 'gap' between the teaching of media studies and media production because questioning the dominant *eidos* was, quite simply, the unthinkable. If this interpretation is valid, then it suggests that those students who were not concerned with the theory-practice problem were bracketing off media studies along the lines of a collection coding orientation. Media studies (or the 'new language') was something to be learned, but not something to be related to the media production process.

5. Student assessments

Thus far, my analysis has centred on a variety of texts which were generated in contexts which explicitly asked students to evaluate the course, or aspects of the course. I now wish to analyse texts which also provide insights to students' reception of pedagogic discourse, but which are very different from the ones examined previously. These texts are the assessments which students produced for the Communicating Science

module. I will begin with the textual analysis assessment. This assessment will enable me to investigate students' appropriation of media studies. Thereafter, I will analyse the students' final production. This assessment will enable me to investigate the extent and nature of students' appropriation of media production discourses, in relation to the 'critical' disposition which I expected students to develop as a result of learning in a combined module (media studies + media production). I will not analyse the first assessment (the treatment) because it was structured in a manner which did not actually require students to demonstrate the acquisition of a particular discourse.

5.1 Textual analyses

I will begin with an analysis of the textual analyses completed by students for the Communicating Science module. The Communicating Science syllabus (Appendix XI) provides a detailed description of this assessment. I asked students to work in groups of two to three (of their own choosing), and gave them a range of texts to choose from for the purpose of textual analysis. Students also had the option to propose a text themselves. Most of the texts for analysis involved a discourse about 'the natural' (cf. Appendix XIII). The following is a breakdown of the texts which students chose for analysis (those with asterisks are texts which the groups proposed themselves):

1. Nuclear Electric broadsheet advert (4 groups)
2. British Telecom broadsheet advert (3 groups)
3. "Why a woman can't be more like a man" article in Good Housekeeping magazine (2 groups)
4. Laboratoire Garnier Synergie Wrinkle Cream magazine advert* (2 groups)
5. Anti-smoking advertising campaign on television* (1 group)
6. British Gas Water Heating, Ballygowan Sparkling Water and Comfort Pure Silk magazine adverts* (1 group)
7. AIDS Awareness Campaign adverts* (1 group)
8. MOBY (popular musician) promotion leaflet, "Everything is Wrong"
9. Natural History TV Documentary (1 group) (total=15 groups, with 22 female and 18 male students[10].

Most of the different texts which students analysed are reproduced in Appendix XVII. Appendix XVIII contains copies of the 15 papers which were handed in.

Given the limits of space and focus of this investigation, I will not engage in a detailed social semiotic analysis of each of the student texts.

Although a detailed semiotic analysis could certainly yield interesting findings (cf. section three, chapter five), it would have to be the object of a separate investigation. Instead, I will engage in an analysis which examines students' acquisition of some categories of social semiotics and media studies. My analysis will also explain how some of the different concepts and theories were 're-recontextualized' by students in their papers: if the lecturer recontextualizes texts, then students *re-* recontextualize the recontextualized texts, transforming them in ways that reveal the traces of an appropriating discourse.

Appendix XIX contains a breakdown of the categories of analysis. These include categories which map the extent to which students organised their papers as required; the extent to which they introduced and defined their research approach; their use of categories like discourse, recontextualization, ideology and others; the extent to which they recognised the possibility of polysemy and ambiguity (or conversely, the extent to which students conflated their own reading with those of the 'target audience'); the extent to which they engaged in an analysis of ideological relations; the bibliographies used by individuals and/or groups; and the individual and group marks which I gave the papers.

I will now summarise the results of my findings of each of these groupings, in turn.

Organisation of papers. As I explained earlier, I will not engage in a detailed semiotic analysis of the papers. Such an analysis would perhaps reveal interesting stylistic-discursive features in the papers. It is nonetheless worth noting that even if most of the groups reproduced the headings which I recommended for the analysis (cf. section on Textual Analysis in Communicating Science Syllabus, Appendix XI), there was considerable variation in how these categories were employed. For example, some groups had relatively close analyses in more than one section (see groups eight and ten. I shall refer to these and other groups as G8 and G10 from here onwards). Some groups had a distinct section devoted to the question of the implied audience (see for example G7 and G13), whilst others had comments on implied audience dispersed throughout several sections (see for example G11 & G12).

Theoretical Framework and Definition of Terms. Only two groups defined their theoretical approach as a semiotic (or "semiological") approach. However, in doing so, they did not explain what exactly this meant (G2 & G4). One other group said it was using a "content analysis" to study the content, and a semiotic analysis to study the form (G9). The rest

of the groups either failed to identify an approach but did define some of the working concepts (G1,G3,G10,G11), or did neither (the remaining groups). Those groups which did identify an approach, and/or did identify terms, appeared to do so to satisfy my framing requirements, only: there was little or no evidence that the group was using the proposed modality of classification throughout the paper. Indeed, in some cases the operational meaning of the term varied across the different sections of some of the papers which began by defining their terms (see for example G10 & G11).

Use of critical concepts. I required students to define and operationalize concepts such as discourse, ideology, recontextualization, and others. Appendix XIX reveals that virtually all of the papers contained sections which did not make any use of one or more of the critical concepts. An analysis of the use of the concepts that the groups *did* employ suggests that in almost all cases there was either a very weak classification and framing of the terms; or an entirely different classification and framing of the terms, from the one I proposed in the course. The following is a list of some of the transformations which arose in this process of "re-recontextualization":

- the concept of **text** was almost universally used to refer to written or verbal texts, and not to refer to a semiotic unity
- although many of the papers contained sections which suggested a certain understanding of the category of **discourse**, some sections re-recontextualized this category as an implicit idea (G11) or as an argument (see for example G9,G10,G11). In many cases, students classified and framed terms in more than one way, *within* a single *section.* Most significantly, nearly all papers re-recontextualized the category of discourse in ways that failed to link it to the interests and values of particular institutions. That is to say, the concept was 'dematerialized'.
- the concept of **ideology** was interpreted by several groups as 'world view', and not as a relation of domination (see for example, G1, G4, G11, G12, G13, G15). Indeed there tended to be little differentiation between this concept, and the concept of discourse. As part of this process, almost all of the groups failed to specify in detail how a text might be promoting a relation of domination.

Polysemy, ambiguity and implied audiences. One of my objectives in requiring group, as distinct from individual analyses, was that students

would be able to witness the extent to which the meaning of their chosen text was the result of a dialectic between the construction of the text and its reception in particular contexts. I recommended that if students had disagreements over the meaning, that this should be mentioned and analysed in the textual analysis as a form of polysemy. However, only five groups (G2, G6, G7, G8 and G14) had sections which considered the possibility of polysemy, or at least the possibility that texts could be interpreted differently by different groups. The majority of the groups either did not recognise the possibility of multiple readings (and/or reified meaning); or if they did recognise it, they did so in ways which reduced the problem of polysemy to an individualised reading process. For example, one of the groups suggested that "It is apparent from our differing interpretations of this that no matter how well you put across your message people are always going to make their own interpretation of it" (G14).

Almost all groups had one or more sections which conflated their own reading of the text, with that of a 'public' or 'audience' which was either not specified, or was specified vaguely. For example, one student said, "the genre of the advert has fulfilled its role [sic]. It's hard hitting and powerful and succeeds in drawing the particular audience wanted" (G1). However, no evidence was provided to back up this statement. In this sense, it is a matter of some interest that only three out of the 15 groups (G1, G2, and G14) actually investigated what the 'target' audience of the text was. This was a requirement for the textual analysis. The rest assumed that the audience was either like themselves; or some stereotypical category which was neither defined, nor justified. For example, one student said "This advertisement was published in this year's May issue of the 'GOOD HOUSEKEEPING' magazine - a magazine which targets middle-aged, middle-class women in Britain"(G9). Another said "The readership of The Guardian is typically, middle class"(G12). None of these statements was backed up with references to the producers of the text, or indeed, a critical understanding of what it meant to be a 'middle-class' reader. On one level, this was to be expected: neither the SCC course, nor my own module taught students about the concept of class, nor about the difficulties and vicissitudes of classifying social groups as part of class cultures. However, I would nonetheless argue that the way in which most students handled this issue suggests that the importance of the *reception* dimension *in general* was neither understood, nor incorporated into the analysis. This is likely to be at least partly the result of the SCC classification and framing whereby

the whole reception aspect was relegated to a single module (The Reception of Science).

Close Analysis. The lack of an awareness of the methodological orientation and boundaries is reflected in the nature of the analyses themselves. Some of the papers contained little or no close analysis of one or more aspects of the texts being analysed (see for example G6). Three of the groups did analyses which suggested a capacity to engage in what were at times extraordinarily coherent analyses (see for example G11). However, without exception, all of the papers engaged in forms of analysis which suggested no appropriation of the social semiotic approach. That is, their analysis was a 'common sense' analysis, which showed little or no understanding of the methodological displacements introduced in the course.

Bibliography. The above point is echoed by the absence in most papers of detailed, and 'working' referencing systems. Those groups that did provide references frequently relied on my lecture notes and course readings for their analytical approach. However, the use of these was frequently tactical, in that students were citing readings to satisfy course requirements, only (see for example, the introduction in G8). Moreover, some of the groups which *did* show evidence of reading appeared either to have drawn on A-level reading. This may mean that at least some of those students had acquired a critical disposition, prior to taking the Communicating Science module.

Before interpreting the general significance of these results, I wish to consider the question of differential acquisition, in relation to the category of gender. Is there any evidence that there were systematic differences in the acquisition (or non-acquisition) of categories of social semiotics and media studies, that can be linked to the category of gender? Although it is necessary to be cautious about the validity of these findings[11], my analysis suggests the following: first, I marked the papers in ways which led to the following difference in the marks: although the same number of female and male students obtained the highest individual marks (4 first class marks each), a disproportionate number of male students obtained upper second class marks (eleven males vs. nine females, out of a total of 22 females and 19 males). Moreover, nine females and no male student received a lower second class mark; and four males and two females received third class marks. Second, the concept of recontextualization was employed, correctly or incorrectly, almost exclusively by male students: seven sections authored by males employed the concept, whereas only one section

authored by a female did so. Third, sections authored by females were far more likely to refer to readings in media studies, than were male sections (eight vs. two sections). To be sure, far more sections authored by females than by males made footnoted reference to any readings whatsoever. Fourth, although more sections authored by female students failed to use the category of discourse (twelve vs. nine sections), more sections authored by male students used discourse in ways that suggested a different classification and framing of the term (seven vs. three sections). Finally, and perhaps most significantly, there appears to be a clear gendering of the choice of sections authored by students. In mixed groups, the tendency was for males to author the introductory and concluding sections. In mixed groups, the tendency was also for females to author the section which provided an overview of the structure.

I now wish to consider what the results of this analysis may mean, from the perspective of pedagogic communication. Although I have just explained that there were some mixed gender differences in the process of acquisition, the results suggest that in general, all students, regardless of the gender, did not actually acquire the skills of social semiotic textual analysis, or for that matter, a critical (in the ideological sense of the term) disposition with respect to the reading of popular science texts. It would appear that they acquired neither the instructional, nor the regulative discourse of social semiotics. Although some groups did produce relatively detailed and subtle analyses, the results suggest that students did not acquire even the rudiments of the system of classification and framing which I attempted to teach.

Given the results of my analysis of my teaching in chapter three, this is unsurprising. Faced with the relatively weak framing of the interdisciplinary framework, and the relatively invisible criterial rules, virtually all of the students responded with an even more weakly framed discourse, which was based on poor commonsense discourses, and/or on the discourses acquired in other learning contexts.

It is likely that the absence of more strongly framed modalities of examination (e.g. unseen tests, testing for the knowledge of specific categories) and the possibility of doing textual analysis in groups (and thereby relying on the knowledge of those who 'did know') contributed to this dynamic. In this sense, the structuring of the assessment itself may well have been an important factor in relation to the extent and nature of the acquisition (or non-acquisition) of media studies categories.

5.2 The final video productions

In this section I will analyse the students' final video productions. Whereas my analysis of the textual analyses allowed me to investigate students' appropriation of media studies categories, an analysis of students' final production will enable me to investigate the nature of the appropriation of media production categories, and indeed their appropriation of media production categories in relation to media.

Appendix XI, which contains the Communicating Science syllabus for 1994/95, offers a detailed description of this assessment. I will nevertheless begin by briefly describing the assessment. I required students to produce a four-minute long video documentary in groups of between four and six. The groups were the same groups as those which had worked since the beginning of the year in workshop exercises. The idea and topic for each documentary was chosen by each group, from amongst the treatments which all students handed in individually as part of their first assessment. Once each group chose a treatment, I asked them to write a rough draft of a script which we discussed in seminars. Those groups which completed this rough draft on time had time to hand in at least two more revised drafts before the final deadline for the final version of the script, which was due the last week of the second term. Each group was then given the four weeks immediately after the Spring holiday to shoot, and edit the production. I recommended that students should plan on having at least two two-hour sessions for the shooting, and two two-hour sessions for the editing. Each group was given the opportunity to request more time in advance if necessary. In the end, most groups spent between four and six hours shooting, and a similar amount of time editing. I have not included a copy of these videos with this thesis to protect the identity of the University. However, Appendix XX contains scripts of each of the final productions.

Once the students completed the videos, I arranged to have a plenary session in which the students and I viewed the videos, and evaluated them. One week afterwards, each student was required to hand in a brief report which explained in a reflexive and self-reflexive manner, the extent to which s/he had fulfilled her/his role in an adequate manner; the extent to which the group had worked effectively; and the extent to which the video text itself had fulfilled the objectives which students set for it (detailed instructions for this piece are also described in the syllabus in Appendix XI. The reports themselves are contained in Appendix XXI.)

From the perspective of the marking of the assessment, a key

aspect was the extent to which students were able to designate, investigate, and actually structure the video in relation to a particular audience group. Another was the extent to which students were able to communicate on the basis of an critical understanding of whatever topic they chose to communicate about. Finally, I also attached considerable important to the way in which students produced the video.

It is not necessary to engage in a detailed analysis of the videos to realise that the groups did not acquire the rules of recognition and realisation for the discourses of media production, let alone a critical orientation to media production and modes of address. However, a detailed analysis reveals the precise regulative orientations which the groups videos did reproduce.

Table 3 below contains a description of the topics selected by each group, the number of students per group, and a breakdown of production roles on the basis of gender. I will begin my analysis with reference to the topics chosen by the different groups. I told the groups that they could choose topics that they had covered in their Issues module, or any subject covered in the Communicating Science module itself. Six of the eight groups (Groups B, C, E, F, G, H) chose topics which were clearly locatable in the Issues module, and which recontextualized instructional *and* regulative discourses which were either taught in that module, or were close to the pedagogic discourse of that module: cancer research, electricity/transport, passive smoking, and the rise in asthma rates. Indeed all of these topics were treated in ways which privileged scientific discourses or the agents of such discourses. In most of these cases, the dominant feature of the text was a long interview with a scientist (a "talking head" interview) who played the role of the 'expert'. It might be thought, in this sense, that there was a relatively strong framing of what constituted scientific, and non-scientific expertise. This was true in one sense, but not in another: only natural scientists were used to talk about natural science, but natural scientists were also used to talk about social phenomena which were clearly not within the domains of their expertise.

For example, a cancer specialist was invited to give his opinion about the effects of the media on social perceptions of skin cancer in one video (Group C), and on the efficacy of an anti-smoking campaigns in another (Group D). A similar weakening of framing did not occur in the opposite direction: no social science expert was invited to comment on aspects of the natural sciences. It might be thought that there was a weakening of the frame in the *vox populi* interviews that several groups conducted. However

G	Topic	N	F	M	Pro	Edit	Pres	Cam	Scri	Res	Audience
A	Screen Violence	5	2	3	F	M	F/M	M	F	F	Teenage
B	Asthma-Pollution	6	3	3	F	F	F	M	F	F	Young parents
C	Skin Cancer	5	3	2	F	M	none	F	F	F	?
D	Anti-Smok Camp.	4	2	2	F	F	M	M	F/M	F	?
E	Prostate Cancer	6	4	2	F	M	F	F	M	M/F	General/Male
F	Electric Cars	4	3	1	F	M	F	F	F	F/M	Young adults
G	Passive Smoking	5	3	2	F	F	F	M	M	M	?
H	Prostate Cancer	5	3	2	M	F	F	M	F/M	F	?

Table 3 Groups, Topics, and Gender in Student Productions. *Key: G=Group; Topic; N=Number of Students; F=Total Females; M=Total Males; Pro=Producer; Edit=Editor; Pres=Presenter; Cam=Camera; Scri=Script-writer; Res=Researcher; Audience=Designated Audience Group.*

these interviews were always represented in such a way that the discourse of the interviewees was made subordinate to that of the interviewers, or indeed to the representation of the scientific discourse itself.

Despite this orientation, many of these videos suggested that students had not acquired the rules of realisation for utterances which conformed to a 'proper' positivist logic in science, or in journalism. The group which communicated about asthma did not fully articulate-- or for that matter *understand* -- the difference between a *causal* link between asthma and car pollution, and a simple *correlation*. The group which communicated about the anti-smoking campaign suggested a relation of causality between smoking and some forms of disease which was not justified by actual evidence. The video which compared coverage of prostate and breast cancer took for granted that there *was* greater coverage of breast cancer by the media, than there was of prostate cancer (to be sure, the group also assumed that such coverage determined, in and of itself, local knowledge of these diseases). These examples suggest that even if there was a positivist orientation on the level of the regulative, students had acquired neither the rules of recognition nor the rules of realisation of the instructional discourses of science by the end of their first year.

I mentioned that two groups did not choose topics which could be easily located within the discursive domain of natural science. These were groups A (screen violence) and D (the anti-smoking campaign with John Cleese). However, it is worth noting that the first group (A) framed the

interview with a social science expert in a manner that reproduced the very discourse which the social science expert was attempting to *contradict* (the media effects discourse). The second group (D) used a natural scientist to comment on the efficacy of the anti-smoking campaign. Moreover, most of this group's video was dedicated to recontextualizing the health statistics of ASH, an anti-smoking pressure group. The manner in which this was done (superimposing character generated statistics over newspaper clippings) suggested a positivist regulative discourse inasmuch as students were employing a positivist rhetoric of statistics, i.e. the facts speak for themselves.

A similar dynamic occurred in the production on skin cancer (Group C). This group interviewed a lecturer in media studies about media representations of fashion (this in relation to sun tanning). However, this same group treated a natural scientist as an expert in the media. Moreover, this group produced the video with the most manifestly sexist discourse: the video began by showing entire sequences of women in bikinis as an illustration of the sun tanning craze. At a later point in the video, this same group employed footage of women taken from the *Baywatch* series. The choice of images, and their representation within the video sequence was clearly organised by a 'male' gaze that did not encourage the reader to take critical distance from the representation as such.

To be sure, this was not the only text which suggested a patriarchal symbolic ruler of consciousness amongst students. The video which compared media coverage of prostate and breast cancer framed the funding of research into the two areas in terms of a relation of antagonism, with the men's disease being 'unfairly' 'neglected'. The video about electric cars made use of video inserts which were based on gendered ways of representing the vehicles as 'technological marvels'. Perhaps most significantly, almost all of the presenters were young women who conformed to the dominant conceptions of female beauty (I will comment on the gendering of production roles, below).

All of the videos attempted to represent their subjects using realist, non-reflexive forms of narration, or what Burch (1991) calls the institutional mode of representation. This I expected, as this is what the instructors taught the students. However, all groups, without exception, had not truly acquired the rules of realisation necessary to reproduce this style. First, all groups experienced at least some difficulty with basic realist conventions on the level of framing, shot movements, and montage. Second, all videos had problems of coherence on the level of the narrative. In

virtually all cases, the videos lacked a clear temporal organisation of the narrated (e.g. they lacked a clearly structured beginning, development, and ending), and a clear voice where the process of narration is concerned ('point of view', or style of narration). To the extent that this was not as evident in students' earlier video exercises, it seems clear that there was a gap, or relation of discontinuity between the training in exercises, and the making of the final productions. Put differently, the short exercises which students performed throughout the year were too short to actually bring to the forefront the problem of narrative organisation. This meant that in a fundamental sense, the exercises were not preparing them for the final production.

Moreover, despite the fact that all groups claimed to be communicating with a particular audience group, not one video projected a clearly locatable implied viewer, that was different from the production group itself, and that conformed to the group's stated audience designation. To be sure, some groups designated such hazy categories that they could be made to include virtually any viewer (cf. table 3, above).

I will now describe the production dynamics. The first thing I wish to describe is students' use of scripts. Writing initial drafts of scripts was a vital mechanism of control and interaction both within groups, and between groups and myself in the final productions. As in the video exercises, the scripts were designed to enable me to control the learning process in the final productions. Here, it is worth noting that all groups handed in one rough draft, but none returned a revised draft for further discussion. Instead, all groups waited to hand in the revised version as the final version, that is on the deadline for the handing in of final versions of scripts. These final scripts showed some changes on the level of the representation of certain aspects, but not on the level of the fundamental orientation, or indeed, in the structuring of the narrative. Several groups did not actually employ the final scripts to produce their final production. After the event, it became clear that students exploited the 'gap' between my own teaching, and that of the instructors to 'redesign' their final productions.

During the production process itself, most groups engaged in the production process on the basis of a relation which weakened the framing of at least some of the production roles. This was particularly true of the roles of researcher, producer, and scriptwriter, where many groups had several different people sharing organisational tasks. In some cases (e.g. groups A, and F) the production was clearly organised by one or two students, with the rest adopting a cooperative, if not always enthusiastic disposition

towards the production. In other cases, either the producer did not have the skills to manage or lead, or the group was made up of students with strong personalities who competed to dominate production dynamics (this was especially true in group C). It was in these last cases where production groups experienced the most disrupted, or most conflictive production dynamics.

In several cases, groups faced the difficulties created by students who either did not perform their assigned tasks, or did not show up at all during productions. This last phenomenon meant that on occasion a different student had to perform as cameraperson, or that the production had to be modified in order to cope with the absence of a presenter.

But the most interesting, and problematic dynamic which becomes evident by means of analysis is the gendering of the adoption of roles within groups. In general, the rule was the following: females performed tasks which involved semiotic decisions 'on paper' (in planning stages), and presentational work; and males performed tasks which involved the technical realisation of semiotic decisions, off screen. Although this distribution may not seem problematic, in practice it meant that male producers had ultimate control over productions.

The above relation can be quantified as follows: all but one of the producers were female. In seven groups with on-screen presenters, only one had a single male presenter (the other production with a male presenter also had a female presenter). The rest used young women. Despite the fact that there were approximately 12% more females than males in the module (cf. table 2, above), in roles requiring the use of equipment there was either parity in the number of men and women (editing) or there were substantially more men than women: in the case of camera, there was a five to three relation of male camera operators to female camera operators. As part of this same process, it is significant that with only one exception, it was always males who did not fulfil their duties, 'dropped out' or even 'resigned' from researcher roles. In each case, it was females who replaced them.

This arrangement reproduced patriarchal relations to the extent that the use of technology was preserved as a predominantly male domain; and that male camera persons and editors created spaces for themselves in which they were either virtually autonomous (camera), or used technology to over-ride plans, and gain control over the overarching narrative (editing). For example, one male cameraperson said "in the end to ease tension I did the shot breakdown which allowed me great freedom with the camera as I

could plan the shots" (camera group B). A female member of Group H described another male cameraperson in ways that suggested a similar control over the filming process: "at the beginning he was really only learning how to use the camera, but as time progressed, he started to experiment. He came up with the idea of using tracing shots to give the video a documentary type effect". The male camera in Group G suggested that he had played an important role in the editing, which was 'officially' performed by a female. In conversations prior to the production, the editor of Group C suggested to me that he was editing because this allowed him to act as co-producer, and to control the 'look' of the production. Although at the time it seemed as a manipulative way of acting, in the context of my research findings it seems to fit within a more general patriarchal pattern.

To conclude this section, I wish to briefly analyse the results of the individual reports that students were asked to hand in after the production, and after the collective analysis (the report is described in the course syllabus; and the reports themselves are contained in Appendix XXI). This report was a mechanism of control, inasmuch as it was meant to help me to ascertain how much work students had done in the production; and also, to encourage students to attempt to link the different strands of the course by providing them with a space in which to be reflective, and self-reflective about their own work. This device was recommended to me by other members of the School of Media Studies, who had used it for other student final productions in the past. In retrospect, I believe that the report invited students to engage in a confessional relationship, especially where production dynamics were concerned. Inasmuch as the confessional relationship is itself a key aspect of patriarchal institutions, then this form of assessment can itself be regarded as a form of patriarchal relation between lecturer and students.

Once again, and with only a handful of exceptions, the results of this exercise showed first, that students did not develop a reflexive, and especially a *self-reflexive* disposition. Thanks largely to the collective evaluation of videos, during which I pointed out the discourses which structured the different productions, many students were able to refer to this dimension of their productions in their reports. However, in most cases students pointed to 'external' causes in order to justify their modes of representation. Speaking about the use of women in bikinis in the production on skin cancer (Group C), the producer said

> whilst as a group we saw nothing wrong with in showing scantily clad women we did not show any scantily clad men. This censorship was a representation of a very sexist discourse and although partially our fault we also felt that it reinforced the message that the media decides what is and isn't favourable - we could not find any footage on scantily clad men.

Comments which suggested a similar understanding of the problem were made by the female producer of the group that showed female, and not male reproductive organs in the programme on prostate and breast cancer:

> It has been questioned why we showed a woman's breast, but failed to include footage of a man's penis. However, this was due to the fact that in the short time designated to research we could not find any adequate footage on men's issues. Although, this may be perceived as a negative point, this reinforces our argument that there is rare footage of prostate cancer.

In these and many other comments, there is a defensive tone to such remarks (to be sure, the questioning subject [I myself] is eliminated by the grammar!). In general students were reticent to 'confess' their 'peccadilloes'. This merits some analysis in its own right. I have already recognised the problematic structure of this aspect of assessment. In addition, I would argue the following: first, the final individual reports were responding at least in part to critiques offered during the plenary viewing session which occurred at the end of the year. Here it is worth noting that in some ways the collective meeting constituted the opposite of the private Catholic 'confessional' mode: it was in one sense closer to a public 'Protestant' form of 'denunciation' (the term is used metaphorically, as of course I at no point actually 'denounced' the presence of sexism in the documentaries). Students thus approached the moment of confession, having experienced the 'denunciation' in collective analysis.

Second, whilst the report aspect of the final project in effect asked students to 'confess their sins' in order to obtain a good mark, the criteria for the video itself warned that students would be marked on the basis of the extent to which their videos were 'critical'. This created a dilemma for students, a dilemma which most resolved as follows: better not to 'confess' at all; or better to 'confess' in way which would not jeopardise the mark of the final production as a whole. This dynamic undoubtedly mediated the extent to which students were able to be reflexive and self-reflexive in their final reports.

Even so, it would be a mistake to attribute the lack of reflexivity and especially self-reflexivity to this factor, only. Once again, students' use of

key terms in their final reports (as shown in the quotes above), and their justifications for the sexism, or scientism in their videos showed clearly that they had not acquired the rules of recognition necessary to realise that their own justifications confirmed the very dynamic that was being critiqued.

6. Conclusions

I will conclude this chapter by summarising its main findings. These are as follows:

- *Receptions of the (unrecognised) collection code.* Especially the staff-student meeting (section 3, above) suggested that a majority of the students *did* perceive the absence of an explicit integrating principle for the course, although this was expressed in different ways by different groups of students. Some students responded by suggesting the need for an explicit, vocationalising orientation (as in the case of the male student quoted in section 3, who suggested that students should be taught the science in one campus, and should then communicate it in another). Others responded by expressing dissatisfaction with the lack of 'organisation' of the course, or by expressing bewilderment as to the relations between the various categories being taught. Still others did so by combining these two modalities of response. However, it is also worth noting that even as many students criticised the lack of 'organisation' and 'links' between the two faculties, a substantial number praised the 'variety' of subjects and issues taught by the course. I propose that this form of response constituted a 'tactical' response, where the term 'tactical' is used in the specialised manner proposed by Michel de Certeau (1984) in his text *The Practice of Everyday Life.* For Certeau, a tactic is "a calculus which cannot count on a 'proper' (a spatial or institutional localisation), nor thus on a borderline distinguishing the other as a visible totality"(Certeau 1984: xix). A tactic is opposed in this sense to a strategy, or "the calculus of force-relationships which becomes possible when a subject of will and power (....) can be isolated from an 'environment'" (Certeau 1984: xix). It would appear that many students not only did not understand, but were not even aware of the integrating principle ("interdisciplinarity") that was being ostensibly developed by the degree, let alone its contradictory nature. (To be sure, not one single student mentioned 'interdisciplinarity' in any of the texts I have analysed in this chapter.) For these students, an aspect of value

was the capacity of the course to provide varied entertainment. This suggests a frame not unlike that used to evaluate a magazine or similar form of popular communication.

- *Receptions of pedagogic discourse.* As part of the above process, it is interesting that many students appropriated the pedagogic discourse of the course in a way that simultaneously transformed, and reproduced the discourses recontextualized by the course. The transformation occurred to the extent that many students 'hyper-evaluated' media production, and effectively 'deleted' at least two key discourses-- the historical discourses, and the discourses of media studies-- when they described SCC in terms of a vocational science communication course. However, the reproduction of the fundamental relations of framing nonetheless occurred to the extent that virtually all students appropriated the category of science, and indeed the process of science communication, along the lines of the regulative discourses of "Two Cultures", PUS, and most fundamentally, positivism. That is, they assumed that science, regarded as a "factual" process, *ought* to be communicated to "the public" in ways that encouraged a positive evaluation of scientific research.

- *Receptions of ambiguities of the relation to the market place.* The dominant modality of reception resolved the question of the course's ambiguity towards the marketplace by suggesting that the course was, or ought to be, a vocational science communication course, along the lines of the PUS discourse. Only a tiny minority of students appropriated the course in terms of the subjectivity which the course was ostensibly promoting, by suggesting that the course provided them with a 'well rounded' or 'broad' education. This suggests the 'humanist', liberal framing that is at the heart of the autonomous modality of pedagogic practice. If any group of students came close to the expected modality of response to the degree, it was this small group. However, it should be noted that not even these students mentioned 'interdisciplinarity' as the *raison d'etre* of the degree. In this sense, even this appropriation constituted a transformation of the SCC discourse.

- *Reception of pedagogic discourse in Communicating Science.* I have already noted that many students effectively 'deleted' the categories of media studies when describing the SCC course. This orientation is unsurprising in the light of my analysis, which suggests that students

failed to acquire the critical regulative discourse of media studies. Despite a certain positive evaluation of the critical dimension of the module in the module evaluation forms, both the textual analyses and the final productions indicate that for the most part, students did not acquire the critical regulative discourse promoted by media studies in general, and social semiotics in particular. In addition, most students did not perceive the need for a coherent relation-- and thus did not perceive the discontinuity-- between the regulative orientation of media studies, and the regulative orientation of the media production instructions.

- *Instructional discourses*. Where the acquisition of recognition and realisation for the *instructional* discourses is concerned, the two assessments which I analysed suggest that students acquired neither rules of recognition, *nor rules of realisation* for the different *instructional* discourses of the combined modality. This was made evident by the unmethodical nature of the textual analyses; and by the failure of most groups to acquire the rules of realisation for basic continuity editing in the final productions. Although I have had to limit the scope of my investigation of students receptions to the texts included in this chapter, both these texts, and other texts which I had the opportunity to read as part of my academic duties (e.g. third year dissertations) suggest that a similar dynamic appeared to take place in relation to the discourses of historiography, and scientific methods: some students may have acquired the rules of *recognition*, but not the rules of *realisation* for the instrumental order of the various discourses being recontextualized by the SCC course.

- *Gendered acquisition, and the reproduction of patriarchal relations*. Last but certainly not least, my analysis also reveals that many students learned and communicated in ways which sustained patriarchal relations, and thereby, differential modalities of acquisition. Here I refer to the results of SCC module evaluation forms, but also to the gendering of the textual analyses and to the final productions. The findings on both levels--SCC and Communicating Science-- suggest that the SCC course as a whole, and my own teaching were far from transforming the forms of relation which Merchant (1980) and Haraway (1989) have critiqued in scientific institutions, and which Arthurs (1989) has critiqued in media production institutions.

Notes

[1] In media and cultural studies contexts, any investigation involving audience or reception research is frequently described as being "ethnographic". I prefer to reserve the use of this term for research which a) provides a "thick description" (Geertz 1973) of the values, codes and discourses of a cultural group; b) does so not on the basis of a single text, but of a range of texts (literal, or by analogy) produced by the cultural group, *over time*. The diachronic dimension of ethnographic research is a crucial, yet much neglected one.

[2] The university prospectus (cf. Appendix V) suggests that there were two tutors handling admissions, one of which was a member of the School of Media Studies. In fact, just one lecturer in the Science Faculty handled admissions.

[3] Similar procedures in other degrees in the University, and indeed in other universities across the U.K. were widely reported to be causing havoc with short and long-term planning.

[4] This weaker framing however did not mean that access students were weaker students. On the contrary, most access students actually arrived with a greater preparation, and/or a stronger motivation than did the younger students.

[5] See for example, C. Merchant (1980).

[6] I will not, for reasons of space and scope, engaged in a detailed critique of positivist conceptions of survey methods. It suffices to say that in a fundamental sense, any and all survey/evaluation questions are 'leading' questions in the sense that they attempt to provoke certain types of answers, and not others. The debate is thus not about what counts as a 'leading' question, but rather, whether the researcher is entirely in control of the framing process, or not. Clearly, no researcher can ever be in complete control of this process, which is a textual one, in the sense that it is always more or less open to a process of interpretation by readers.

[7] Significantly, both modules-- the Reception of Science, and Science Journalism-- were strongly criticised the following year, by the next cohort of second-year students. This despite the fact that a different lecturer taught the Reception of Science, and that the Science Journalism module was partly reorganised (see section three for more details). This suggests a more 'structural' curricular dynamic than might otherwise be assumed from such criticisms.

[8] I normally taught this module. However, since I was on sabbatical, during the 1995/96 year one of the course's external examiners taught the module.

[9] This form was based on the one used by the Media Studies staff. Until the 1995/1996 year, SCC staff did not employ one shared module evaluation form. This is further evidence of the collection code, which I described in chapter two.

[10] One female and one male student did not hand in a paper. The slightly lower total number of students (42) vis-a-vis the total mentioned in Table 2 is the result of the fact that two females and one male student had dropped out of the course by the time the textual analyses were handed in.

[11] As I explain in Appendix XIX, any effort to engage in such an analysis is risky because in at least in some cases, one student did the work of other students. There is thus the risk that a student of one gender could have written a section which was apparently authored by a student of another gender.

Chapter 5

Towards a Praxis in Science Communication

Introduction

In this last chapter, I will revisit the research questions which I posed earlier in this thesis. I will also propose a model for what I call 'researched production': given the results of my research, is it possible to conceive a practical alternative, which is conducive to a more critical practice in science communication? Finally, I will consider what further research could be carried out on the basis of my findings.

1. The integration of 'media theory and practice', revisited

My research has been motivated by a practical educational problem: it appeared that my teaching was not achieving the desired aim: students in the Communicating Science module were not developing a critical disposition towards science communication. In the words that are commonly used in the educational field, they didn't seem to be 'integrating media theory and practice'. Was this the case, and if so, why was it the case?

My research confirms that students were not 'integrating media theory and practice'. But more fundamentally, it reveals the extent to which I formulated the entire phenomenon in misleading terms: the problem was not that students were not integrating 'media theory and practice', but rather, that students were not engaging in the practice of media production on the basis of the regulative discourse of media studies.

To represent the problem in this manner is to transform its meaning. For the problem is not simply to 'integrate theory and practice', but to replace one form of discursive order, identity, and relation, with another. In effect, to *interrupt* an entire process of cultural reproduction, and to replace it with a new discursive order. It is only when it is viewed in this way that the magnitude and complexity of the task becomes evident. My research reveals that students were not acquiring a new, more critical regulative orientation after taking the Communicating Science module. In addition, they were not acquiring the rules of realisation for an instructional

discourse based on the new regulative orientation. It is thus unsurprising that they were not engaging in more critical forms of science communication.

Why was this the case? Part of the problem appears to lie in fundamental mismatch between the aims and objectives of the SCC course, and the students that were recruited for the course. I suggest that the course projected an implied student that was in agreement with an autonomous modality of pedagogic practice, that was in agreement in the case of the Communicating Science module with questioning existing forms of science communication, and replacing them with more critical forms. The students that the University recruited not only did not match this model of learning, but learned on the basis of the opposite model: I have shown that most students wished to acquire the cultural capital necessary to enter the marketplace, and reproduce existing modalities of science communication.

Although this "gap" between the aims of the teaching process and the expectations of the students is clearly an important one, my research has revealed what are perhaps even more fundamental problems in the structuring of the teaching process, per se. My research confirms my initial hypotheses that the problem lay not only in 'ideologised learning', but in 'ideologised teaching': on the level of Communicating Science, the structuring of pedagogic discourse conflated media research practice with media production practice, even as its curricular genres internalised the empiricist forms of classifying and framing 'theory' and 'practice' which normally separate media studies and media production modules. In turn, the SCC course as a whole was driven by a similarly syncretic conception, and by an analogous process of internalisation. There was a syncretic effort to bring together the categories of science and culture, and the effect of this was that the SCC course internalised the "Two Cultures" modalities of classification and framing.

This was not, however, a simple or mechanical process. Bernstein explains that the dominant principles in society, and indeed the pedagogic device itself specify basic principles of order, relation, and identity (1990:196). But they may do so in ways that create an arena of challenge, conflict, and dilemma. This was very much what happened in the SCC course, and indeed in the Communicating Science module itself. Despite the ultimate reproduction of the "Two Cultures" symbolic ruler of consciousness, the SCC course *did* produce a certain dis-ordering of the traditional pedagogic device. The SCC degree did create a space where lecturers from fields which where strongly insulated could teach on a single

course. It did develop a curriculum which at first glance, seemed to contest some of the most fundamental forms of classification and framing with respect to science and humanities. Moreover, it did recruit students from both science and humanities backgrounds, thereby contesting the dominant forms of classification of education, in relation to work. For its part, the Communicating Science module *did* create a space in which both media studies and media production discourses were taught, and did invite students to engage in a questioning of the forms of pedagogic relation which exist in TV programmes about science and nature.

As a result of these transformations, there were times when there were conflicts between lecturers and students, between the staff members in both faculties, and between lecturers and instructors. These were directly or indirectly generated by the "disordering" of boundaries, and they attest to the fact that the SCC course *did* create a certain "arena" in which there was conflict, challenge, and contestation.

It would, however, be a mistake to push this last point too far. My research has revealed that, whatever the dis-ordering, whatever the transformations, the pedagogic relation between the aspects of construction and reception of pedagogic discourse continued to reproduce, *within* one single course, all of the boundaries and contradictions which had hitherto maintained the study of 'science' and 'culture', 'media theory' and 'media practice' as separate domains in higher education. So even if, in Bernstein's terms, a 'discursive gap' *was opened*, this discursive gap came to be structured in ways which ultimately reproduced the dominant symbolic ruler of consciousness. By "discursive gap", I refer to spaces which, according to Bernstein, "may become the site of alternative realisations, the site where it becomes possible to think the unthinkable, to think the 'impossible'" (Bernstein 1990: 182). It is clear that in the case of the SCC course, such gap momentarily emerged but was eventually recolonised by the "Two Cultures" symbolic ruler of consciousness. The course ultimately promoted, and its students reiterated, an understanding of the relation between science, communication, and culture in which science was perceived as being factual and 'value-free'; and in which science communication was conceived as a 'technical' process of unproblematic delivery of information about science.

As part of this process, it is a matter of considerable interest that the Science faculty maintained the preeminent position in the new relation with Humanities. It is nonetheless important to recognise that, despite the unequal distribution of economic and symbolic capital between the two

faculties, the new degree contributed vital resources to the Humanities Faculty. Indeed, key figures in *both* faculties shared the view that the science categories *should* be privileged. Many, if not most science and humanities practitioners assumed that the degree was 'about science', and about *science* communication. In this sense, it was unthinkable for many, perhaps even most practitioners in *both* faculties to consider the opposite premise: that to the extent that science was to be treated as a cultural *discourse*; and that to the extent that the main factor in student recruitment was the allure of media production, that the humanities faculty should be the privileged and privileging partner.

Any simplistic, "one-way" conception of the relation is also disproved by the fact that the structuring of the teaching of media studies in relation to media production itself contributed to the dynamic in question. It is true that, contrary to what was suggested by some of the para-curricular markers, the space provided for the teaching of media and cultural studies was in a relation of minority to other discourses. It is also true that the space for the teaching of media studies was embedded in the oppositional logic of a positivist regulative discourse which preceded the structuring of the Communicating Science module. However, I explained that my own teaching lacked a clear (and critical) integrating principle. This, along with the classification of the curricular genres within Communicating Science, led to an empiricist regulative orientation where the boundaries between media studies and media production are concerned. This orientation had the effect of confirming the overall, positivist logic of recontextualization of pedagogic discourse in the SCC course.

2. A model for researched production

I explained in the introduction of this thesis that I would use the results of my research to propose a new modality of pedagogic practice. In the terms introduced in this thesis, I would like to use the results of the research to propose a new **theory of instruction** for teaching and learning a critical media production praxis. This for the SCC degree, but also for courses whose practitioners have the aspiration of teaching students critical forms of mass communication, in factual genres.

But how to develop a theory of instruction? In the introduction of this thesis, and in Appendix I, I explained the reasons why existing theories of instruction, particularly 'grand theories of instruction', are not suitable. Although some of these theories make some interesting proposals, and may indeed provide valuable insights for some levels of pedagogic practice, using them in a manner that disregards the fundamental dynamics of classification and framing in the pedagogic context being considered is the equivalent of using normative grammars in the domain of media production. As part of this problem, such theories do not take into account the intimate link between the content and the form of the educational process, between specific modalities of classification and framing.

For these reasons, I proposed in the introduction that it was necessary to engage in a form of action research, albeit, not the form of action research proposed by Carr and Kemmis, two of the most cogent scholars of the educational action research movement. In Appendix I, I critiqued Carr and Kemmis's proposals. I suggested that one of the problems in their approach was the radical opposition of so-called "theoretical" and "practical" educational research (cf. Appendix I, and Carr and Kemmis 1986). I argued that it *is* possible to make use of so-called "theoretical research" in order to transform one's educational practice. But in doing so, I recognised that approaches like Bernstein's do not actually propose alternative forms of pedagogic practice, *in and of themselves*. Indeed, as Bernstein himself has said, his essays "are not concerned with grand narratives, commentaries, critiques, or recommendations. There are no immediate policy implications, no indicators of effective economic performance, no diagnostics, and certainly no pedagogic utopias" (1990:9).

This, however, is not a reason for not attempting to derive some policy implications from the results of the research. I propose that it is legitimate to engage in this task provided that it is clear that the resulting theory of instruction, as the term itself suggests, is distinct from the theory

used to explain the pedagogic practice. The theory of instruction constitutes an instance of the recontextualization of the results of the research, with all of the transformations that this entails. I further propose that although this process entails a number of risks-- the risks entailed in engaging in *any* form of practice, which can never be the result of an entirely rational process-- it is indispensable to take such risks if the research is to promote more critical forms of pedagogic practice. To be sure, in some of his later work, Bernstein himself has applauded efforts to derive more critical forms of practice from research driven by his theory[1].

This, then, is how I intend to proceed. I will use my research to identify pedagogic problems and to propose some ways of addressing them which are themselves informed by the findings of the research. My primary concern will be to address the problems which I identified in the Communicating Science module, and in the SCC course. However, discussions with a number of colleagues lead me to believe that many of the problems may be present in other courses of the combined modality, especially (but not exclusively) those that combine the teaching of 'media theory and practice', with the teaching of non-media studies categories. In this sense, it is possible that the proposals which I will make could be used in other courses as well. For this reason, I shall divide my proposals into two parts. In the first part, I will represent the new modality of classification and framing in a relatively abstract manner. This should facilitate the use of the theory of instruction in other courses. In the second part, I will illustrate how the general principles could be used to develop a specific curriculum for the SCC course.

2.1 Researched production: the general model

In this section, I will present a general model for what I shall describe as **researched production**. I will do so by suggesting some ways of addressing the different aspects of pedagogic practice which I analysed in the previous chapters.

The question of the orientation to the marketplace. I will start with a consideration of a dilemma which is faced by many practitioners developing combined courses. It is the dilemma created by the opposition between the autonomous, and market-led orientations. The first orientation overlooks the whole question of employment; and the second entails the loss of critical

autonomy vis-a-vis market discourses. I propose that it is necessary to move beyond this opposition. This by developing an orientation which provides students with rules of realisation of 'visible' categories, but in a way which is both methodologically and ideologically critical. A methodologically critical orientation can be achieved by teaching and learning about the process of mass communication from the perspective of a hermeneutic perspective: a perspective which reveals the structures, dynamics, and inter-relation of the production, construction, and reception of symbolic goods (Thompson 1990). In speaking about 'mass communication' I should perhaps clarify that I do not simply refer to communications involving large numbers of media users. I refer to what Thompson (1990) has described as institutionalised forms of communication, which involve a 'break' between production and reception, an extension in time and space of the availability of messages, and the public circulation of symbolic forms. The category thus includes broadcast television, but also leaflets produced by a small organisation to foster grass-roots activism. Mass communication is, from this perspective not simply a matter of 'massive' audiences[2]. (And of course, 'mass' audiences are not passive audiences, or 'vulgar' masses.) An *ideologically* critical orientation can be achieved by teaching and learning about the process of mass communication on the basis of a *critical* hermeneutic orientation: by teaching and learning about the ways in which mass communication has historically served to develop and/or maintain relations of domination between or within social groups (Thompson 1990). However, the acquisition of the above discourses would be regarded not as an end in itself (autonomous orientation), but instead, as a process which should ultimately inform what I will describe as the process of **researched production**.

The question of integration. In the paragraph above, the word 'informed' is chosen very deliberately. For I have explained in numerous parts of this thesis that the problem in developing critical forms of production is not simply to find the media 'theory' that 'guides' the 'practice'. Instead, the problem is to articulate the relationship between the different discourses, in ways that preserve the specificity of each form of practice, even as one is used to influence the other. This is the fundamental challenge: the challenge of developing a coherent, and critical principle of integration for the teaching of media studies, and media production. To fail to address this problem leads

either to an explicit or an implicit collection coding orientation, with the results that I have analysed throughout this thesis.

This problem is made more complex in combined courses which develop a specialism (e.g. science communication, environmental journalism, media and design, and so forth). In courses such as these, it is necessary to provide two separate, but inter-related integrating principles. The first is a principle that integrates the different research discourses. I will provide a model for this form of integration under the heading titled "Integrating research discourses". The second is a principle that integrates the research discourses, with the media production discourses. I will provide a model for this principle under the heading titled "Integrating research with media production".

Integrating research discourses. In SCC, and in all combined courses which recontextualize media studies with some other research or academic discipline, there is a need to develop an integrating principle for the different research discourses. The SCC course failed to do this, and this was a key factor in the reproduction of the "Two Cultures" symbolic ruler of consciousness.

Before proposing a way of relating the different categories, it may be useful to consider the following question: is it actually necessary to teach other research discourses, along with media studies? I believe that it is. My argument is based not so much on a liberal conception of education (the 'well-rounded' education), but on the suggestion that it is necessary to teach about the discourses which the mass media communicate *about*. In order to communicate in a critical manner (methodologically and ideologically) one must be critical with respect to one's own discourse of communication, but also with respect to the discourses one communicates about. If students do not have the chance to engage in a detailed study of the discourses and fields that the media communicate about, then they are more likely to be uncritical with respect to these. On these grounds, it *is* important, indeed crucial to develop the space in combined degrees for the critical examination of discourses and fields which the media communicate *about*.

One way of doing this is by specialising all or aspects of the degree. This may seem problematic to those who rightly question some of the existing specialisations on ideological grounds. I would nevertheless suggest that the nature of the specialisation can actually be quite radical. In addition to the existing 'mainstream' media specialisations (e.g. journalism,

or specialised forms of journalism), it is possible to conceive specialisations which are based on radical modalities of classification and framing[3]. Although a question mark would remain in regard to employment prospects for students with more radical specialisations, specialisation does not necessarily entail the reproduction of existing professional specialisms in the mass media.

The question is thus, how to recontextualize the different research discourses in this type of course, in a manner that avoids the vicissitudes of the collection code? One way of doing this would be to classify, and frame the process of mass communication as the production, construction, and reception of symbolic forms or goods, across different *fields*. The field(s) of science, the field(s) of art, of the popular reception of mass media texts, and so forth. Here I would employ Bourdieu's conception of **field** as a cultural network of positions[4]. A key aspect of teaching researched production would be to devote curricular space to the critical examination of whatever field or fields were being communicated *about*. This would entail engaging in a cultural analysis of the positions, the relations between positions, the circulation of the different forms of capital, and of course the discourses and discursive constraints faced by agents working within these fields[5]. Doing so in this way would provide a critical orientation to the analysis of the field, and not just the reproduction of the fields' values and discourses, as occurred in SCC.

Of course, such an analysis would need to be accompanied by a critical analysis of the communication process, itself. Here it would be necessary to address two general problems: first, teaching in detailed ways about the forms of communication themselves; and second, linking this form of study to the study of fields which I have just proposed.

In response to these problems, I would propose two inter-related forms of practice. First, I propose that the texts analysed in this process would need to be considered in relation to the structures and dynamics of **genre**. The justification for this is twofold: first, all forms of communication, but especially the mass media forms, are embedded in genres. Second, if all mass media texts are genre-bound, it follows that the acquisition of the rules of realisation for any mass media text is thus linked to the acquisition of the rules of realisation of genre.

Here it is important to clarify that I am working with a very specific notion of genre. I draw on the work of Latin American communication and culture studies, where genre is conceived not in terms of a normative grammar, or even in terms of conventional textual properties, but as

"strategies of communicability" or forms of inter-relation (Martín-Barbero 1993) that act to synchronise the horizons of expectation of producers and audiences, by means of textual forms which institutions develop and change over time[6]. A key aspect of teaching and learning researched production would thus be to examine a small number of genres exhaustively from the perspective of this genre theory: genre histories, genre modes of production, genre texts, and the different modalities of reception of genres. Each of these aspects would have to be articulated in relation to the rest of the aspects, and indeed to the dimension of field mentioned earlier. In some cases, it would be possible to treat some of the contexts of production, and reception as fields in their own right[7].

But if the study of genres is to be linked to the study of the fields whose discourses are recontextualized, then it is necessary to establish a clear and explicit principle of integration for the analysis of field, and the analysis of genre communication. This is the 'junction' or 'gap' between media studies, and other academic discourses. One way in which this integration could be developed would be by means of the concept of recontextualization. Thus far, I have used this concept to describe the pedagogic process in the university, only. I nevertheless believe that, suitably modified, this concept could provide the basis for an integrating principle which would link the teaching about field, with the teaching about genre communication (see Appendix XXII for an example of such a modification). This may seem like a form of discursive imperialism. But Bernstein makes the point in several of his essays that his theory has wider application than formal education[8]. I thus propose that the two categories-- fields and genre media texts-- could be linked by means of an analysis of the discursive transformations entailed by the recontextualization of field discourses in the discourses of media genres. To be sure, this same concept could be used to link media texts, to audiences.

Integrating research with media production. The study of fields and genres would serve to inform a methodologically and ideologically critical practice-- that is, a **praxis**-- in media production. This leads me on to the central problem for my thesis, a problem which can now be reformulated as follows: how to relate the study of field and genre, the study of the process of recontextualization, to the production of more critical forms of mass media texts in production modules?

Before producing media texts about a particular field and discourse, students would need to be taught about that field, and about the genre they

were to communicate in. They would need to approach at least the final course productions on the basis of a 'researched' understanding of these two. This research would occur in the non-media production modules. This suggests the need not just for the development of a strong integrated code with strong horizontal communication between lecturers, but also a carefully considered, and very explicit set of *sequencing* rules. I shall discuss this problem under another heading, below. For now, I am more concerned with recognising that, despite the importance of this knowledge, *it would not be enough for students to approach media productions with an understanding of the process of recontextualization, alone.* To propose this would be to fall, once again, for the 'media theory and practice' syncretism which I have critiqued in this thesis.

Instead, I propose that the recontextualization of media studies and other academic research disciplines would provide a critical horizon for the formulation of a **theory of production** (that is a theory for production) within production modules or workshops. Contrary to what usually occurs in the traditional vocational modalities of classification and framing in combined courses, I am proposing that modules devoted to media production should themselves be places of and for theorisation.

In suggesting the above, I do not mean to curtail the space for 'actual' production in production courses. Clearly, students would need to acquire the rules of realisation of the instructional discourses for particular technologies, and the semiotics associated with those technologies (where technology is itself regarded as a cultural form). Put somewhat crudely, I fully recognise the importance of *doing* media production, in the sense of giving students the space to engage in, and repeat again and again, media production exercises.

But as I suggested earlier, doing media production is always doing media production in particular genres (or in relation to particular genres), and in relation to particular topics or discourses generated in fields. I thus propose that teaching and learning media production would need to be structured in ways *which enable students to critically address issues arising in relation to the study, elsewhere in the course, of field and genre.*

In making this proposal, I am mindful of my earlier critique of both 'realist', and 'idealist' theories of instruction. If the teaching is to move beyond the idealist-realist opposition, then it would have to avoid two pitfalls: reproducing existing genre forms, uncritically (realism); or disregarding the politics of genre entirely, by allowing students to "play" with conventions (idealism). In order to avoid these two orientations, I will

now propose a new theory of instruction for workshops, which involves developing a **theory of production**-- that is a theory for production-- on the basis of what I will call **producerly analysis**.

What is 'producerly analysis'? Producerly analysis involves the theorisation of examples of ideologically critical practice within *or in response to* the genres and fields analysed elsewhere in the course. This may seem to replicate within the production space, the other aspects of the course, particularly those of genre analysis. But whereas the teaching about genres in non-production modules would emphasise the *critique* of ideologised genre texts, producerly analysis in the production modules would emphasise a relation of *solidarity* -- of critical solidarity, but nevertheless of solidarity-- with respect to the (alternative) form of practice. In this sense, producerly analysis is the media production equivalent of what I've described as a **theory of instruction** in the context of pedagogic practice. Engaging in producerly analysis would lead to the formulation of **theories of media production**, with categories for media production which would be proposed and taught to, indeed at times developed jointly with, students.

How would lecturers and students engage in producerly analysis? The process would begin with lecturers selecting media texts which the teaching team felt were examples of more critical forms of communication, in *or in relation to* existing genres. I do not discount the possibility that in some contexts, texts adhering to mainstream genre conventions can provide symbolic spaces for the contestation of relations of domination. But I recognise that existing genres tend to be structured in ways that produce or reproduce these relations of domination[9]. Hence, my suggestion that the selected texts could also be critical *responses* to existing genres. By this I mean texts which either parody genre rules, or transform them to form new genres. Whatever the case, it would be crucial for the whole teaching team to analyse and to consider the merits of the different texts, in the context of the overall teaching process.

The first teaching and learning stage would entail explaining to students why a particular text was chosen, and how it was produced. This aspect of the explanation would include a discussion of technique, but technique in relation to the producer's initial 'concept' and 'intention', and crucially, in relation to the regulative discourses which were contested or reproduced by the producer. At this stage, it would be very useful to either ask the producer(s) to visit the course and talk to students about the production process; or to provide students with a text, verbal or audio-visual, which describes the "making of" the text in question. Here I have in

mind studies like Silverstone's (1985) *Framing Science*, (and preferably others with a more feminist approach) which illustrate in a highly accessible manner, the *social* complexity of the production process.

Important as this first stage of 'producerly' analysis is, it would need to be followed up by an account of how the intentions of the producer, as empirical subject, are transformed into a particular text, and therein, a **subject of enunciation** (Bettetini 1984). Bettetini defines the subject of enunciation as a symbolic apparatus that is the organising principle of all of the semiotic processes of a text, including the ways in which the text attempts to position the reader. It is, according to Bettetini, an 'absent' apparatus, producer and product of the text, which leaves traces of its organising procedures in its signifying materials (Bettetini 1984:13). Producerly analysis would involve studying these 'traces' in detail, and in a manner that would reveal how the traces serve to position audiences.

This analysis might well reveal aspects of the text which escaped the control, and intentionality of the producer. Indeed, the object of engaging in this task would be to simultaneously help students to simultaneously achieve a greater control over the subject of enunciation in their own productions, and to enable them to become critical of the tendency to conflate the meanings of the text, with one's intentions as empirical producer. This pragmatic[9] approach would be fruitful inasmuch as it would enable students to understand that they must in effect transform themselves into a symbolic other, an other which is simultaneously much more, and much less, than they themselves as empirical, 'intentional' subjects. In this sense, acquiring rules of realisation in media production entails grasping not just the 'mechanical' skills of media production, but the semiotic-pragmatic skills whereby the signifier becomes charged with oneself, even as it remains an other. An other semiotic material; and of course, a sign which may be interpreted quite differently by others.

Ideally, producerly analysis would include a stage which enables students to consider how empirical subjects, that is 'actual' audiences, appropriated the analysed text. A key aspect of this process would involve examining the ways in which any ambiguous, or polysemic aspects of the text were appropriated in discursively specific ways by audiences situated in particular fields. Given the relative scarcity of qualitative audience research of this type, I realise that this could be impractical in some cases. In those cases where it is impractical, perhaps an informal process of audience research could be carried out with respect to the students' own interpretations.

At the end of the analytical phase, the lecturer would derive some **categories of production**-- actual modes of production-- from the analysis, and would ask students to attempt to emulate one or more of these categories, in their own practice. Here I suggest that the teaching and learning would have to be structured along the lines of principles which are not entirely dissimilar from those of craft pedagogies. Not entirely dissimilar, but not identical: students would still need to be critical with respect to the proposed model for the following reasons: first, they would have to produce their own text for particular audiences, which might not be the same as the analysed texts'; and second, the new social context would necessarily be quite different (I have discussed the transformations implied by the process of production in the secondary context, as distinct from the primary context). Students would thus need to be asked to modify the model according to pragmatic considerations (in the technical sense of the term "pragmatic"), which they would be asked to consider during preproduction planning sessions. This process should be regarded not as a negative necessity, but as the opportunity for the acquisition of more reflexive and self-reflexive rules of realisation.

From the above process, it should be clear that students would be required to communicate with audiences. For this process to be effective, students would be required to work with empirical audiences, that is, audiences whom they could and would interview prior to the design of the media text. This could be done as part of the process of study of field, and genre, in other modules.

It would also be useful for the students to show the finished production to the same audience, in order to obtain their feedback. Doing so would illustrate the process I mentioned earlier, with respect to the subject of enunciation[10]. Finally, it would be equally important for the lecturer to analyse the results with students, but this in a context which was not framed by the assessment procedures which I analysed in chapter four.

The question of the visibility of pedagogic practice. I will now discuss issues relating to the visibility of pedagogic practice. Once again, I see the need to move beyond a problematic opposition: the opposition between forms of teaching that are so 'visible' that they become empiricist or positivist discourses in their own right; and forms of pedagogy that are so 'invisible' that they entirely neglect the question of the acquisition of visible skills, and so-called 'bodies of knowledge'.

Here I would like to propose the following general principle: that the

course and each of its modules should *begin with a relatively visible pedagogy, and gradually move over the three years towards more invisible forms of pedagogy.* The general justification for this is that a relatively visible pedagogy makes it possible for more students to recognise boundaries between categories, thereby making it easier for a wider range of students to acquire the forms of classification, but equally, and most importantly, to eventually *contest* them. Here I am mindful of Bernstein's research, which suggests that even if both visible and invisible pedagogies are "biased" towards the middle class, invisible pedagogies make it particularly difficult for working class students to acquire the rules of recognition and realisation of discourses. But I am also mindful of Bernstein's suggestion that the most conservative courses produce the most radical students. Without wishing to take this last suggestion too far (!), the following are some ways of concretizing it:

- *Pedagogic practice should be based, initially at least, on images, analogies, models and examples which are relevant to students from the very beginning of the course or module* (though these images, analogies or models may later need to be replaced by other more critical ones). This principle can be exemplified with reference to my use of 'concept-oriented' lectures. Many of my lectures tended to begin from the theory. That is, I began with abstract concepts which I then 'illustrated'. I am proposing that instead, the teaching should begin from everyday life, everyday texts or discourses, and render them opaque by means of critical discourse.

- *As part of the above principle, pedagogic practice should include a detailed description of the everyday subjectivities of the agents involved in the production of discourse.* If, for example, a particular scientific field is analysed, then it is necessary to describe it with reference to the subjectivities of agents within that field. The same principle would apply to the subjectivities of media producers. In my experience, it is all too easy to neglect this aspect. Doing so has a doubly negative effect: first, it makes for a problematically self-referential form of analysis, which takes for granted that students understand the field's subjectivities, and thereby its subjects. And second, it makes it virtually impossible for students to use the critical process to actually 'return' to the dominant symbolic ruler of consciousness in a manner that is capable of mediating it.

- *Pedagogic discourse should aim to achieve the acquisition of visible rules of realisation for all of the critical discourses being recontextualized by the course.* If I have used the title 'researched production', it is not just because I assume that students should simply learn to *recognise* the complexity of the process of mass communication, and *recognise* relations of ideology therein. I assume that students should also acquire the skills necessary to *research* social relations, and then the skills to produce media texts which are informed by the results of research. In this sense, I reject the subjective oppositioning, according to which one either learns to become an 'academic' researcher, or a media producer. Where the acquisition of research skills are concerned, I would thus emphasise the need to teach not just theory and metatheory, but also strong, and practical *principles of description.* It is one thing to teach about reception research, and another to explain how a student her/himself can engage in reception research. The model for researched production calls for both forms of learning. Where the acquisition of production skills are concerned, I would emphasise the need to provide the pedagogic space required to control whatever technology is being used, but this in the context of particular genres, and particular regulative orientations (see discussion on producerly analysis).

- *Pedagogic practice should be based on, at least to begin with, relatively visible forms of assessment.* This proposal leads on from the previous one. I propose that after recognising the problems of assessment-driven education, it is necessary to develop forms of assessment that are based on visible criterial rules. One way of doing this is by formulating, and teaching around assessments that require students to demonstrate the acquisition of explicit categories. It is all too easy, for example, to teach about textual analysis in a general manner, and to then require students to 'do a textual analysis' without actually providing concrete criteria, and a concrete methodology for this process. I believe that my research has shown the extent to which this weakened framing not only encourages a 'common sense' interpretation of the role of media and cultural studies, but actually disempowers students by not providing them with the means, or indeed the incentive to learn rules of recognition and realisation for

particular research skills.

- *Pedagogic practice should develop visible sequencing rules both within curricular units and strands, and across curricular units and strands.* This is what is commonly referred to as 'progression' in discussions about curricula. This principle suggests the need to articulate the *temporal* order of teaching according to explicit principles which students can recognise at the outset of the learning process. In this sense, it is possible to describe the importance of this principle by analogy to plots. The student as reader of the curriculum or module must be able to discern a 'plot' which links the various 'events' in a module, and across a curriculum. The outline of this plot must be provided in syllabi, in para-curricular markers like the Essential Papers, but perhaps more importantly, in periodic meetings or discussions with students, which remind them of the place and significance of a teaching-learning event, as part of a broader narrative or 'celestial' logic. Clearly, the principle of relevance which I proposed earlier applies to this level of pedagogy as well: the plot must be understood, and seem relevant to students.

- *Pedagogic practice should be based on pacing rules that make it possible for students to acquire rules of realisation.* As Bernstein notes, sequencing rules imply pacing rules. To establish a sequence of teaching events entails deciding how much time to devote to each event. Teaching media and cultural studies entails the following dilemma: the field is based on some extraordinarily complex modalities of classification and framing; in order to explain these in depth, it is necessary to cover a lot of ground, and if there is little time to do so, then one runs the risk of covering too much ground, too quickly. This is likely to be a particularly exclusive feature of pedagogy, with respect to less able students. But even with the faster students, fast pacing is likely to be conducive to a dynamic whereby students acquire recognition, but not realisation rules. The pacing rule must thus be developed in a manner that enables most students to acquire rules of realisation for whatever discourse is being taught. This principle applies within a module; over a single curricular level or year; and of course, over the three (or four) years as well. And it applies to the teaching of research discourses, as much as it does to the teaching of media production discourses.

The last principles which I've proposed are not particularly innovative. In some respects, they are the stuff of educational primers. I have nevertheless included them in this thesis for two reasons: first, because they are, to use a semiotic analogy, the crucial signifier without which it is impossible to acquire the signified of the pedagogic text. And second, to contest forms of pedagogy which exchange so-called "conservative" pedagogies for "liberal" pedagogies-- visible pedagogies for invisible pedagogies-- on the basis of naive understanding of the relation between classification, framing, and the subversion of a cultural order.

Having made this point, I would nonetheless reiterate a point made at the outset of this section: that the pedagogy should move from relative visibility, to relative invisibility over the three (or four) years of the undergraduate course. Doing so, gradually, would preserve the space for all students to engage in more transgressive forms of classification and framing towards the end of their undergraduate degree.

2.2 Researched production: the SCC course

So much for general framework. I will now illustrate one possible realisation of this model by using it to propose a restructuring of the SCC course.

I will begin by proposing a rationale for the new curriculum. The fundamental aim of the course would be to teach students a praxis in *science* communication. The integrating principle for the course would be science communication as the recontextualization (cf. Appendix XXII) of scientific discourses, by the mass media. Scientific discourses generated in a science field are de- and re-contextualized in a mass media field and text, which is then appropriated in a new field, or fields: the field(s) of the popular reception of popular science texts.

This principle would be embodied in a course which would teach students about

- the structure and discourse of specific fields of scientific research;
- the structure and discourse of specific fields of science communication;
- the structure and discourse of specific fields in which these mass-mediated discourses are appropriated;
- discursive transformations entailed by each subsequent

recontextualization (including those produced by audiences).

As part of this process, the course would teach students

- ways of researching genre texts, and their reception by particular audiences;
- ways of representing science in particular media and genres which are informed by a knowledge of the above aspects.

How to structure a field and genre approach, in a manner that is meaningful to students? Assuming that the modalities of reception which I studied in 1994/95 can be generalised, I propose that one way of doing so would be to structure the course around the figure of the 'investigative science communicator', relying initially on commonsense understandings of this category, and building towards more critical understandings. I further propose that the teaching would specialise in the communication of particular social 'issues': I propose health issues for the first year of the course, and environmental issues for the second year. Students would then revisit either in more depth in their third year. I suggest these two issues because both are charged with tangible social implications, and both are likely to seem immediately relevant to most students. Indeed, in the SCC evaluations discussed in chapter four, students expressed a positive orientation towards the modality of teaching and learning in the 'Issues' sub-strand. Although I noted in chapter two that the structuring of this sub-strand reproduced the forms of classification associated with the "Two Cultures" discourse, this does not disqualify the figure of 'issue' in general. As long as the issue is conceived as a *social* issue, and one that involves communication across two or more *fields*, as mediated by one or more *genres*, then the educational process can be 'issue-based'. This would make possible a more visible pedagogy to the extent that it would enable the educator to formulate more visible questions, and eventually, more visible criterial rules: how do scientists currently understand this issue, and why do they understand it in that way? How do different social groups understand this issue, and why do *they* understand it in those manners? How do the media communicate about this issue, and again, why do they do so in this manner? Is this a valid way of communicating, and if so, for whom is it valid? If not, what constitutes a more valid way of communicating about it?

In keeping with the approach to 'researched production', the course would need to specialise in particular genres of mass communication. There

are a number of ways in which this could be done: the entire course could specialise in a particular genre; each year could specialise in a particular genre; or each year could have 'units' which specialise in genres. Each of these proposals has its advantages and disadvantages; greater specialisation makes possible a slower pacing and more in-depth treatment, but this in turn closes off the opportunity to explore genre *differences*. Excessive specialisation could also be a disadvantage from the perspective of prospective job opportunities for students. However, the opposite extreme could also be problematic: the study of dynamics within too many fields and too many genres could provide students with too shallow an understanding of each. For this reason, I would propose for the following compromise: for a three year course, I would devote each of the first two *years* to the study and production of one genre of communication; and I would devote the last year to more in-depth work with one of the two genres presented in the first two years.

I would propose working with the following genres: during the first year, leaflets about health issues (e.g. safe sex, breast cancer, or nutrition), and during the second year, video documentaries about environmental issues. Beginning with leaflets would have the advantage of providing an 'object based' medium and genre, which would be easier to analyse in a detailed manner, but which would nevertheless exhibit a number of multimodal features: verbal text and image text, layout, and so forth. From the point of view of future employment, analysing and making leaflets would also constitute a useful skill to acquire, since numerous organisations produce them. Last but not least, leaflets are also a common way of communicating about health issues.

Moving on to video documentaries in the second year would provide a sense of progression to more complex and 'glamorous' media, and would be particularly suitable from the perspective of the politics of video representations of environmentalist issues. Students could, for example, analyse and produce alternative representations of road protests, or other forms of direct action. A knowledge of video production would also eventually provide students with a 'transferable skill' for multimedia productions. Last but certainly not least, the analysis of video would provide students with the space for the development of critical television reading skills.

How to organise the above into a coherent curriculum? Figure 1 represents an outline of a curricular structure which could be employed to teach such an approach. I will begin by providing a bird's eye description of

the curriculum, and then will provide a more detailed explanation of the structure of its Science Communication, and Media Production modules.

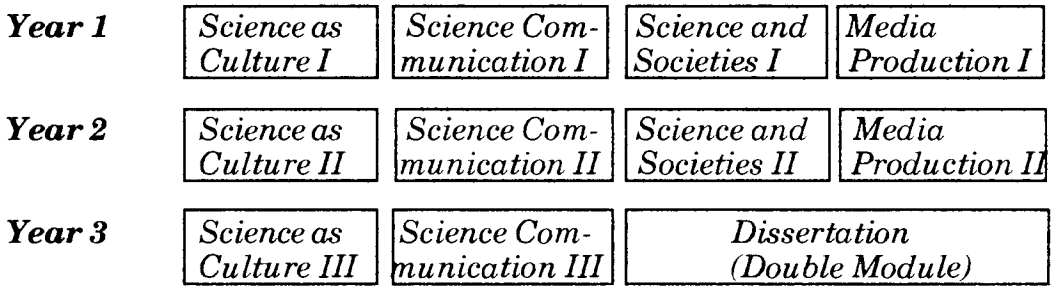

Figure 1 New Curriculum for SCC

The curriculum would teach four 30-credit subjects per annum. This credit scheme is the one that was used by the Faculty of Humanities at the time which I was writing this thesis. I propose using this scheme, and not the five-module scheme, because it would be more suitable for the integrating principle which I mentioned earlier. Moreover, it would reduce the potential for *disintegration* by reducing the number of modules which need to be integrated, from both the teaching and learning perspective.

The curriculum would be structured by four inter-related strands: Science as Culture; Science and Societies; Science Communication; and Media Production. The **Science as Culture** strand would teach about discourses of health (year one) and the environment (year two), generated in medical and environmental sciences research fields. This strand would recontextualize not just the finings of these fields themselves, but also and perhaps more importantly, the discourse of a growing number of scholars, who over the past ten or so years have begun to research scientific cultures (cf. Haraway 1989), the rhetoric of scientific discourse (cf. Locke 1990; Myers 1990), and indeed, scientific literacy itself (cf. Halliday & Martin 1993). A key aspect of these modules would entail a critical examination of patriarchal relations with respect to health and environmental issues: body politics, but also the gendering of nature and of scientific institutions in general. Each of the modules making up the strand would have as its final assessment, a socio-historical analysis (Thompson 1990) of the discursive representation of a specific health or environmental issue in the relevant scientific field. In year three, students would choose to take a more advanced module in whichever of the two fields (health or environmental studies) they chose to work with in their dissertation.

The **Science and Societies** strand would teach about the

recontextualization of research about these issues in State fields, and in everyday life. In order to do so, this strand could teach about the history of state educational campaings, and on recent ethnographic studies on social perceptions of risk with respect to health (year one) and environmental (year two) issues (cf. Douglas, Irwin & Wynne 1996). This module would have as its summative assessment, a cultural analysis of the way in which a state educational campaign engaged-- or failed to engage-- with popular understandings of a particular health or environmental issue.

The **Science Communication** strand would provide the space for a social semiotic analysis of the leaflet genre (as used to communicate about health issues) in year one, and the video documentary (as used to communicate environmental issues) in year two. In year three, students would have the option of taking a more advanced module on whichever of the two genres they chose to work with in their dissertation. The assessment for each of these modules would be a social semiotic analysis of the construction and reception of a particular leaflet (year one) or video documentary (year two).

The **Media Production** strand would teach students to communicate about the issues studied in the first two strands, in or in relation to the genres and media studied in the Science Communicationstrand. This on the basis of what I described earlier as 'producerly analysis'.

Finally, the **dissertation** would involve choosing one of the previous issues (health or environmental studies), and genres (leaflet or video documentary) and producing a more advanced text, on the basis of more sophisticated diagnostic of the relations within, or between the fields studied. In effect, the dissertation would provide students with the space to do research, and media production at a greater level of complexity than was possible in previous years. It would also provide each student with the chance to do their "own thing", even as they helped other students to realise their own projects. The completed text would then be shown to focus groups in the level III Science Communication module, in order to provide each student with detailed feedback about her/his production. Appendix XXIII contains an example of how the sequencing for the different strands could work for a given year in the course.

I will now describe in more detail the pedagogic practice that I envision for the Science Communication module, and for the Media Production module. I will concentrate on just these modules for reasons of space, and focus. I will begin with the **Science Communication** module.

Teaching and learning in this strand would centre on the analysis of the recontextualization of the discourses studied in other modules, in the mentioned genres of mass communication. The emphasis would be on linking the recontextualization of the health or environmental discourse, to the process of genre communication, where genre is conceived as a relation between production, construction, and reception. In effect, teaching in the new module would always be 'located' within a particular genre, whose features would be examined in some detail.

Each year, the teaching would be structured in a manner that would prepare students to do a textual analysis of a genre text (leaflet in year one, and video in year two) and then audience research. The textual analysis would be somewhat unorthodox in that it would require students to begin by analysing the context of production of the genre text. This would involve interviewing the producers in order to better understand the constraints they faced during the production process. Interviews like these would also enable students to ascertain what the producers' intentions were, and what audience(s) they were attempting to reach.

This preliminary stage would be followed up by a detailed textual analysis that would have the object of revealing the social construction of the text. However, the textual analysis would also relate this aspect to the results of the first stage of the research: were the producer's intentions realised? Where there aspects of the text which escaped the producers' intentions? What relations of ideology, if any, may have been promoted by the text?

This first assignment would be followed up by audience research about the reception of the analysed text. Indeed, the second half of the course would be devoted to teaching students focus group techniques, and discourse analysis. The first and the second assessments would be linked to the extent that the textual analysis would serve to generate hypotheses about the possible readings of the text. The hypotheses would then be tested by means of focus group research. Aside from teaching students about the complexity of the process of mass communication, this process would have the added benefit of preparing students for future work in communication consultancy roles.

In the Science Communicationmodule, as in all other modules, there would be an emphasis on teaching students visible principles of description for the different forms of research. Moreover, there would be a clear progression towards more complex and subtle forms of analysis. Hence, the value of having the same module repeated, with greater depth and

complexity, each year. For example, the first year might introduce basic social semiotic terms-- sign, representation, text, discourse -- and the rules for their use in the analysis of texts that could be readily analysed in lectures and seminars (this is part of the rationale for using leaflets in the first year). The second year would develop a more elaborate account of the process of recontextualization, and would teach theories of, and principles of description for more complexly multi-modal media (e.g. video).

The actual realisation of this process in lectures and seminars would be as follows: plenary lectures would be used to explain the different aspects of the process of mass communication, and to provide key examples of research practice, according to a very explicit, that is *visible* pedagogy where hierarchical, but especially where sequencing and criterial rules are concerned. They would be followed by seminars with smaller groups, which would be used to provide students with the opportunity to engage in the form of analysis exemplified in the lecture. Indeed most of the seminars would be devoted to student presentations, during which each group of students would present, and receive feedback on their plans for the textual analysis, and for the focus group research.

Whereas in the past my teaching previously oscillated between the concept-driven and 'textual analysis' modality, each of which had problems (cf. chapters three, and four), my teaching would now be based on a new modality which would integrate these two as follows: I would always begin by introducing either a 'textual' example, or an issue which could be recognised by students. Thereafter, I would pose a question of the example or issue in terms which students would also be able to relate to. Having done this, I would then proceed to introduce key concepts and procedures, but always with reference to the text or issue. This process would be repeated in seminars, with respect to students' own analyses.

Where assessment is concerned, each assessment would be strongly framed, in the sense that students would be required to engage in the textual analysis, and in the focus group research, according to very explicit criteria and methodologies which the course would teach them throughout the year.

I now wish to turn to the **Media Production** module. This module would play a key role in the curricular structure. However, it is important to note that the restructuring of the curriculum on the basis of a strong integrating idea and code means that the module would not have to provide all of the context for researched production. On the contrary, the teaching and learning of media production would be embedded in a context which

should enable students to communicate quite differently about a topic. This is a key difference with respect to the current SCC course, and indeed, with respect to the combined modality in general. These tend to operate on the basis of collection codes, and on the basis of a 'false' integrating principle (media studies as the 'theory' for media 'practice').

Nonetheless, and as I explained earlier, the new curriculum would be meaningless unless it were corresponded by a change in pedagogic practice *within* the production course, itself. If the course were taught on the basis of either an 'idealist' or a 'realist' theory of instruction, the entire curricular structure would be useless. Hence the importance of having the production course taught by a lecturer with an intimate understanding of the academic discourses being recontextualized in the course; and a capacity to teach students to develop forms of communication on the basis of her/his intimate 'producerly' knowledge of radical forms of production in the particular genre.

Indeed, each year, the Media Production module would centre on just one genre, one medium, and the issues analysed in the rest of the curriculum. The links between this module and the rest could only be developed if, as I suggested above, the lecturer was familiar with the various strands; and if the sequencing of the various strands was staggered. If, for example, the course was organised on the basis of three terms, then students could be asked to complete their research for other modules by the end of the second term, or the beginning of the third term, to then devote the rest of the third term to producing their final 'major' production.

This lecturer would need to structure the module around three different, but inter-related modalities of pedagogic practice. The first would be 'producerly analysis' of examples of critical forms of communication, and the generation of theories of production for the different genres being studied. The second form of practice would involve the design, production, and evaluation of actual texts, within the relevant genre, in response to the results of research produced in other modules *and following the model generated by producerly analysis*. The third modality of practice would involve teaching students to control specific technologies. By this I refer to exercises with the various types of equipment, which occur prior to the actual 'researched' production. The teaching of some of these tasks could be performed by technicians. However, the lecturer would need to structure this teaching in ways that avoided a regression to exercises which decontextualize production decisions from communication contexts. Doing so to some extent is inevitable; however, at least some elements of context

can always be incorporated in even the simplest of production exercises. For example, if students are being taught to use different fonts, then an exercise can be developed which asks students to choose a font which is suitable for a particular communicative context. This integrates both the instrumental aspect of the process (learning to select fonts from a menu) and the semiotic. Within each module, and within the strand as a whole, there would be a sequencing of exercises involving more and more complex forms of communication, and more and more complex contexts of communication.

Each year, there would ideally be at least two full productions, which would involve the following: for the first full production, attempting to 'improve' the design of the leaflet which each group analysed for the textual analysis of the Science Communication module. For the second, final production, producing a leaflet which redesigned the analysed leaflet entirely, on the basis of the findings of the textual analysis *and* the focus group research carried out in the Science Communication module.

Throughout this process, the lecturer would adopt the role of something akin to a 'Socratic', albeit a non-patriarchal, mediator: asking questions about the meaning and value of production decisions, regarded always as (social) semiotic decisions; and about how these relate to the designated audience and to the context in which that audience is expected to read the text. Of course, the lecturer would have to have the freedom to 'rove' throughout the various times and spaces of production.

It is not possible to exaggerate the importance of this 'Socratic', and 'mobile' aspect of the pedagogy. This role would not only guarantee the lecturer's, and thus the critical discourse's presence in all aspects of production, but would have the role of developing students' semiotic reflexivity and self-reflexivity. As part of this role, such a modality could help to interrupt the reproduction of patriarchal relations by discussing with students the ways in which gender-based ideologies are produced and reproduced by means of technology. Indeed a key aspect of the module at the end of each academic year would be to discuss in detail, the relations that developed between group members. But this in the context of an informal group discussion, and not as some form of collective denunciation or marked "self-analysis".

I will now comment on the transformations which this new curriculum entails, vis-a-vis the SCC curriculum which existed until the 1996/1997 year.

First, the question of the relation between the secondary and the

primary field, or education and work. The pedagogic practice would be structured neither by the autonomous, nor by the market-oriented modality. It would teach students very specific and visible 'skills' which *could* be exchanged for economic capital in a number of workplaces. However, the emphasis would be on developing modes of cultural practice that contest dominant symbolic rulers of consciousness. At the end of the three-year course, students *would* have so-called basic communication 'skills', but also, the capacity to critique relations of domination in the science and science communication fields, *and to propose and realise alternatives.* This is what I would describe as a 'critical vocational' approach.

Second, the boundaries and codes operating in the curriculum would be radically changed. The boundaries would no longer be based on the "Two Cultures" opposition between 'science' and 'humanities', or 'science' and 'culture'. Science would be taught *as culture*. There *would* be boundaries--there always must be-- but the criteria would change: the boundaries would occur between different *fields*, as conceived by Bourdieu. However, even here, there would be important changes. Whereas the 1994/95 curriculum operated with high external values of classification and framing of 'science' subjects and 'humanities' subjects, the new scheme would operate with much lower values: all teaching would be based on a single social theory, structured along the lines of a social semiotic conception of science communication. Moreover, the integrating idea would be specifically designed to *link* the different fields by showing the successive transformations of scientific discourses. Hence, although each strand would explore the specificity of its field (science, science communication, or other) it would constantly make reference to a central web of concepts, and to a single process. Indeed, the curriculum would be based on an integrated code, and would have teachers-based integration. As I explained above, the integrating idea would be the study of the process of recontextualization of scientific discourses across different fields.

Third, the course would be structured around a relatively *visible* modality of pedagogic practice, especially during the first year where sequencing and criterial rules are concerned. Students would be informed, in terms they could understand, about the structure and forms of progression of each aspect of the course, and about the course as a whole: for example, "during the first year you will be taught how to use leaflets to communicate about specific health issues".

I will now discuss several potential problems with the above

proposals.

The first of these is the one that behoves any curriculum with an integrating idea and code: the extent to which there is sufficient integration amongst staff members to teach such a curriculum. Clearly, unless the staff have a shared academic discourse, and share a theory of instruction, it would be difficult to teach my proposed curriculum. But after recognising the need for (and thus the potential problem of) integration on the basis of a particular discursive orientation, it is important to remember that the new SCC would continue to be an *undergraduate* degree. The first SCC curriculum projected a model pedagogic subject which was more appropriate for an MA-level course, than it was for a BA. I make this point because at least in the first and second years of the new degree, much of the teaching would cover "basic concepts" and issues in research which could be taught by many, if not most lecturers in media and cultural studies provided that they had some understanding of the different social-scientific issues, and could familiarise themselves with suitable issues and examples for analysis.

Another potential problem concerns the sequencing and inter-relation of the various strands. I have suggested that the sequencing of the different modules would have to be inter-related. This too, would require close integration on the part of the teaching staff. Here, I have recognised that it might only be possible to engage in full 'researched production' in just the final production of each year, and of course, in the dissertation module.

Another problem could be found in the relation between the different modules. It could be argued that this relation is still based on a linear conception of communication: 'learn the science, and then learn how to communicate it'. This, however, not the case. The Science as Culture modules would teach about science as discourse and as field, whereby there could be no return to the PUS model of science communication. Moreover, each of the strands would maintain a 'relative autonomy' from the rest to the extent that it would reveal the logics of its own field(s) of study, logics which cannot and should not be reduced to a lineal conception of the process of recontextualization.

I now wish to conclude this section by discussing what is, in my view, the fundamental problem. It is one thing to recognise problems in classification and framing, and another to transform the existing modalities of classification and framing, *across an institution*. If one can speak of 'lessons', then the fundamental lesson in both the SCC course as a whole, and the Communicating Science module in particular is that in both levels

the 'old' modes of classification and framing continued to emerge like the proverbial heads of the hydra. One of the reasons why this happened was that the modes of classification and framing were embedded in *all* levels of the pedagogic text, including the institutional organisation and hierarchy. Here Bernstein's, but more generally Foucault's notion of discourse is important in that it reminds us of the institutionally embedded nature of all forms of knowledge. Until this embedding is recognised, and with it, the power of institutional interests, dilemmas and contradictions, then the discursive process is likely to undermine even the most radical pedagogic re-conceptualizations.

What to do about this level of problems? I propose that the educator is faced with the problematic which Max Weber once articulated in terms of the tension between an ethics of conviction, which in its extreme form becomes an ideologised idealism; and an ethics of responsibility, which in its extreme form becomes a form of methodological violence, or methodological realism[12]. To disregard the relations of power, the contradictions, dilemmas and interests would be to engage in an ethics of conviction which would result in a situation not unlike the one faced in the SCC course, where a certain idealism on the part of the founding practitioners may have led them to disregard the whole question, indeed the whole problem of the institutionally embedded nature of knowledge. In this sense, it could be argued that the prudent course of action in such a context would be to design a curriculum which recognises the balance of power in the institutional context.

On the other the hand, the opposite case can also be argued. Although there may have been some idealism in the structuring of the first SCC course, in the end its prevailing ethic was an ethic of responsibility. After a first 'moment' of idealism, after a first discursive gap opened in which a fundamentally different course seemed possible, the structuring of the new course became driven by the need to devise a curriculum which respected the institutional forms of classification and framing. This by maintaining a strong insulation between the science and humanities categories in the curriculum as a whole; by maintaining an equally strong insulation between media 'theory' and 'practice' categories; and last but not least, by structuring the relations between the discourses in a manner that made sacred the very category which the course was attempting to secularise.

In such a context, to propose another 'realist' model would be to reproduce the very dynamics which this thesis has revealed. For this

reason, I would argue that it is necessary to produce a critically utopian discourse which might provide the space for thinking the unthinkable. If a 'discursive gap' is to opened again, then it is crucial to present alternatives which may at first glance seem unfeasible, but which may nevertheless offer new, more critical ideals which practitioners may work towards. This is the spirit with which I have developed the model for **researched production**.

3. For further research

To conclude this thesis and chapter, I would like finally to look back on my own research process and comment on its limitations, as well as on areas that would warrant further research in the future.

The first and main limitation of my research is, paradoxically, its *raison d'etre*. As I explained in Appendix I, my research was not structured on the basis of the neat distinction between researching subject and researched object which is normally a requirement for social research. I researched my own practice, and this meant that, from the start, my handling of the conceptual relation between subject and object did not conform to the orthodoxy of the social semiotics of pedagogic practice. I set out to research what, in the dominant sociological consciousness, is the un-researchable: that is, my own practice. Although this can be represented as a process of contestation in its own right, I am keenly aware of the limits of such a 'contestation': the philosophical maxim, *know thyself*, can never be fully achieved. For this reason, I engaged in this research in the knowledge that in many ways, I would lack the sort of *bonne distance* which social scientific research is normally premised on. I nevertheless am convinced that the lack of orthodoxy in my approach has not prevented me from making discoveries which are relevant to my own teaching, and perhaps to that of others as well.

Another limitation of this research is that I could not research the relation between students' reception of pedagogic practice, and students 'local practice'. That is, the relation between learning and particular structures of class, 'race', ethnicity, previous education, and especially, everyday life. I explained in chapter four why I could not engage in such research, and this undoubtedly constitutes an important limitation in my research. Even so, my research did reveal at least some significant gender-based differences in the evaluation of the SCC course, and in the

participation of students in the production process. I propose that future research on this subject would need to examine the structures and dynamics of differential acquisition far more rigorously, and above all, in relation to the structures of 'local practice'. Here the general question could be, does a particular structuring of pedagogic practice in the combined modality favour the acquisition of media studies and media production categories by particular social groups? As a working hypothesis, I would propose that courses with an invisible pedagogy, with an autonomous and critical orientation, but with a 'media theory and practice' split, would be particularly exclusive of male working-class students where the acquisition of media studies is concerned; and of female working class students where the acquisition of media production categories is concerned.

A third limitation is the relative absence of detailed empirical research into the construction and reception of SCC *modules* different from my own. I explained in chapter two that the SCC course was too large to be researched in detail by a single researcher with limited resources. I also faced the ethical problem of investigating my colleagues' practice, at a time when there was considerable sensitivity about pedagogic practices across the two faculties. A larger research team, constituted perhaps by other practitioners in the course and in both faculties, would undoubtedly uncover a number of features of pedagogic practice which I failed to detect in my own investigation. Interviews with other practitioners, and the analysis of 'public' documentation, though useful, have their limitations. Although I am satisfied that my research did uncover the fundamental relations in the degree as a whole, the ideal would be an investigation which compares and contrasts pedagogic practice by means of empirical research into all levels of pedagogic practice across the entire curriculum.

From the perspective of micro-pedagogic research, it is also true that my research did not engage in systematic, and highly detailed analysis of any single pedagogic *encounter*. By 'highly detailed', I mean for example an analysis of the social semiotic structure of the linguistic utterances of the various speakers, such as is made possible with the methodology of Halliday (1994) or of critical discourse analysts like Kress and Hodge (1993). This constitutes a limitation in both Bernstein's approach, and my own. Research into the intermediate or macro-structures does need to be accompanied by detailed research into the social semiotics of pedagogic encounters or specific aspects of the pedagogic text, that is, by a micro-pedagogic analysis. Here, research into specific seminar dynamics, and media production dynamics would be particularly useful. This as an area of

research which requires considerable semiotic expertise, but which is clearly important to the development of an educational praxis.

Last but certainly not least, my investigation was limited by the relative absence of research into the problem of the acquisition of rules of realisation for media production in higher education, and indeed in other contexts. I believe that a whole new field of research can be developed in relation to the question of the development of what I will refer to as media producer literacies. How is it that audio-visual producers learn the rules of realisation in particular genres? Media Studies and media education have begun to do research into the development of media *reading* skills, or what might with Bernstein be described as the acquisition of recognition rules for media communication processes. But it is one thing to investigate the acquisition of recognition rules for media reading processes, and another to investigate the acquisition of the rules of realisation for empirical production in particular media genres. Research into the latter domain would shed light on what remains the fundamental problem for lecturers in combined courses: how to help students to acquire the desired (critical) realisation rules in media production? I believe that my thesis has shown some of the reasons why this *didn't* happen in my own course. It has also proposed some ways in which this *could* happen in a new course. It would however be a matter of some interest to conduct more exhaustive research into the acquisition of realisation rules by producers in a variety of media and genres, and particularly in those cases where producers are able to interrupt processes of social reproduction.

I propose that processes like these could be fruitfully studied on the basis of Bernstein's theory of pedagogic communication. If it is recognised that "in house" media training involves a process of construction and reception of pedagogic discourse, then it becomes possible to conceive a research process that studies the ways in which producers, or prospective producers, acquire the rules of realisation for particular genres. In my view, this is a process which could be powerfully explained with a theory which is capable of linking the forms of classification and framing in an audio-visual text, to the forms of classification and framing in the institution as a whole. This was something which I began to do in this thesis when I suggested how the content and form of students' videos reproduced in part the forms of classification and framing which prevailed in the SCC course. A research project more specifically focused around this problem, which was informed by the history of the modalities of pedagogic practice associated with "in-house" training, could provide fascinating insights into a process which has

until now been scarcely researched.

Notes

[1] In his latest work Bernstein describes the efforts of researchers to use his theory to develop forms of pedagogy which are less exclusive towards particular social groups (cf. Bernstein 1996).

[2] For interesting examples of research about this process, see Janice Radway (1987). In the context of science communication, a much less developed, but still useful example is found in the work by Roger Silverstone (1985 & 1986) on the production, construction, and reception of a *Horizon* documentary.

[3] Here I have in mind the extraordinary work of the BA (Hons) in Communication and Culture offered by the Valle University in Cali, Colombia, where students were taught to engage with a variety of grass roots organisations in Cali and in the surrounding towns. In effect, the traditionally depoliticised conception of 'public relations' was turned on its head, in order to make way for a radically politicised conception of the role of a variety of forms of communication within any given community or 'public sphere'. Students were taught to analyse the forms of communication within specific fields, and to make proposals that were conducive to more democratic forms of interaction within those fields.

[4] Bourdieu defines the concept of field as "a network, or a configuration, of objective relations between positions. These positions are objectively defined, in their existence and in the determinations they impose upon their occupants, agents or institutions, by their present and potential situation (*situs*) in the structure of the distribution of species of power (or capital) whose possession commands access to the specific profits that are at stake in the field, as well as by their objective relation to other positions (domination,subordination, homology, etc.)" (Bourdieu 1992:94).

[5] To recontextualize the concept of field, and the concept of discourse in this manner is of course, a sacrilege. Bourdieu does not recognise the category of discourse, as formulated by Foucault, or by Bernstein. I however believe that the two categories are mutually complementary. One emphasises structure; the other, process.

[6] 'Act to synchronise', but don't always manage to. See Mattelart & Mattelart (1990) for a fascinating account of this problem in Brazilian *telenovelas*.

[7] The complexity of the process of mass communication becomes apparent when the inter-relation between the concepts of field, and genre are examined. Although many genres of mass communication are field-specific, in which case their rules act to articulate horizons of expectation according to the rules of a specific field, many span across two or more fields. In this case, the genre rules act to mediate the differing sets of rules across the different fields. Moreover, in the case of the mass media, the media genres are produced within a distinct field-- the field of mass communication-- which has its own rules, and its own rules for establishing mediations between rules.

[8] "The models that I develop here should be able to describe the organisational, discursive and transmission practices in all pedagogic agencies and show the process whereby selective acquisition takes place. I also want to make it very clear that my concept of pedagogic practice is somewhat wider than the relationships that go on in schools. Pedagogic practices would include the relationships between doctor and patient .... psychiatrist and the so-called mentally ill ... architects and planners" (1996:17). I propose that, provided that the extension of the concept was linked to a theory of mass communication, the concept of recontextualization could be extended to the relationship between media producers, and audiences.

[9] Here I am aware of two equally problematic dangers: the first, and most obvious, is an approach which fails to recognize the hegemonic nature of mainstream media genres. But the second danger involves assuming explicitly or implicitly the disposition of those who, like members of the Frankfurt School, condemn any form of communication which does not explicitly contest relations of domination. The risks of assuming a left-wing elitism as part of this second stance have been discussed in detail by numerous scholars, including Martín-Barbero (1993).

[10] Pragmatic as in the tripartite distinction suggested by continental semioticians,according to which analysis can emphasise the syntactical, semantic, or pragmatic dimensions of a text.

[11] Although the whole audience aspect is crucial, I wish to emphasise what, in my experience, is the somewhat forgotten importance of understanding, and developing links with, a critical community of producers. For such links to develop, it would be necessary to create the space for actual conversations or conferences with the producers. However, here the object would not be simply to weaken the framing of the degree, as is proposed by the advocates of realist theories of instruction. Rather, the object would be firstly, to explore the biography of the producer as a lived, and political experience within, or in relation to a particular genre; and secondly, to explore the very process whereby, in my earlier terms, an empirical subject becomes a (symbolic) subject of enunciation. The chance to meet and/or listen to producers "in flesh and blood" would be indispensable in making this process more concrete. I am aware that this last proposal may seem to be a return to an 'auteur' conception of media production. I would however note that my use of Bettetini's conception of the subject of enunciation is meant to counteract the dangers of the fallacy of intention (Thompson 1990).

[12] Here I paraphrase P. Ricoeur's (1974) reading of Weber's distinction.

Media Studies in Higher Education

Appendixes

Appendix I

A Critique of Carr and Kemmis' Methodology of Educational Action Research

Introduction

In the past ten to fifteen years, two research traditions have become well-established alternatives to both theoretical and applied research in education. These new forms of educational research are the result of dissatisfaction with two common approaches to educational research. On the one hand, a number of scholars have pointed out the problematic nature of so-called *grand theories* of education, or what with B. Bernstein, I would identify as grand "theories of instruction": normative theories which attempt to provide models for good teaching practice on the basis of an *a priori* set of educational goals or ends. Though 'practical', these theories pose a number of problems. First, they are based on the assumption that a model of 'good' teaching eliminates any further need for critical reflection about educational ends. Second, they tend to be based on a process of translation (or what in this thesis I shall describe as the "recontextualization" of preexisting theories of psychology or philosophical principles, and not on research into the specificities of educational types or contexts. Finally, with the possible exception of a handful of critical pedagogies[1], they tend not to be ideologically critical: that is, they are not based on a theory of the relationship between education and power.

Scholars who are advocates of the newer traditions of educational research have also pointed out the problems with both 'pure' (e.g. sociology) and applied educational research traditions (e.g. applied psychology). The first type of research is not based on the practitioners' own categories of understanding, or practical action. The second, especially in its more positivist forms of "policy science" (Fay 1977), is limited by the crudely instrumental nature of its reasoning: its promoters make a radical distinction between educational means and ends, and attempt to conduct ostensibly value-free research about the educational means. Advocates of the "reflective turn", like the critics of policy science in general, argue that the means-ends distinction is not only 'impractical', but a mystifying account of the educational process. This to the extent that it dissimulates the fact that educational ends and means are always inextricably intertwined.

In response to these problems, one group of educational researchers have taken what Schön (1983; 1991) calls "the reflective turn": they have

suggested that it is necessary to ground any proposals for educational practice on the observation, description and explication of educational practitioners' understandings of their own practice. In doing so, they argue that any practical proposals must be based on an explanations of the understandings which are already built into the teacher's actions in everyday practice (Schön 1991:5). In order to research these understandings, the advocates of the "reflective turn" have used a variety of approaches, which include psychoanalytic theory, narrative theory, and critical theory[2].

Another group of researchers, while agreeing with the need for a "reflective turn", has nevertheless proposed an even more radical methodological shift: that educational research should be carried out *by the practitioners themselves,* and in relation to their own practice. The advocates of this approach, known as "action research" or "teacher-as-researcher", agree that instrumental conceptions of educational means and ends, and educational theory and practice (cf. section two) are ultimately unsustainable. But they also argue that if teachers are to develop more critical forms of practice, then it is necessary to develop forms of enquiry in which educational research and professional development can be more easily integrated. They also argue that research conducted by researchers 'external' to the practice may be of some value, but it is bound to be severely limited by the researcher's externality to the practice. So although external researchers may participate in the educational research process as "facilitators", the research should be carried out by the practitioners themselves. After all, or so the advocates of this position argue, it is the practitioner who must transform his or her own practice.

I shall critically examine the issues that this stance gives rise to later in this appendix. For now, I simply wish to note that these methodological debates are welcome inasmuch as they redefine the boundaries between questions which have traditionally been the domain of the philosophy of education, and questions which have traditionally been the domain of empirical educational research. This redefinition of boundaries makes it possible to pose questions about the autonomy of the researcher, the validity of particular research epistemologies, and the relationship between educational theory practice, but this in ways which overcome the false certainties of more traditional, positivist forms of educational research.

Even so, it is worth noting that, despite the proliferation of 'reflective' and 'practical' proposals, few researchers have discussed in detail the epistemological and methodological issues faced by educators who wish to research their own practice. In this sense, it is easy for proposals like these to become slogans which are no more than the other side of the same positivist coin.

This to the extent that they are unable to transcend the opposition between objectivism and subjectivism, theoretical and practical research, or between coherence and relevance in educational research.

In this sense, perhaps the only sustained and coherent effort to develop an entirely new epistemology and methodology of this new type of research is found in the work of the S. Carr and W. Kemmis (1986). Their central text, Becoming Critical, attempts to address the epistemological and methodological challenges posed by *both* the emerging "reflective turn", and "teacher as researcher" traditions. Carr and Kemmis' work is also exceptional in that it constitutes a sustained effort to develop both a 'practical' and ideologically critical epistemology for what they call **educational action research**, which they define as

> a family of activities in curriculum development, professional development, school improvement programs, and systems planning and policy development. These activities have in common the identification of strategies of planned action which are *implemented,* and then systematically submitted to *observation, reflection and change.* Participants in the action being considered are integrally involved in all of these activities" (1986:164-65; emphasis in the original[3]).

Throughout the rest of this appendix, I shall offer a critical review of several important features of this approach. I shall consider first, Carr and Kemmis' call for a greater educational professionalism based on educational research; second, their critique of technical, and practical or "interpretive" approaches to educational theory and practice; third, their characterisation of a "post-empiricist" epistemology for educational research; and finally, their characterisation of educational action research as a form of Habermasian Critical Social Science. Although my review will explain why, in the end, I shall *not* use Carr and Kemmis' proposals, the review will enable me to make explicit a number of my own methodological assumptions.

1. E.A.R. as the basis for educational professionalism

Carr and Kemmis justify the need for Educational Action Research with an appeal to the need for a greater professionalism amongst educational practitioners. Their criteria for professionalism are the following: first, the methods and procedures employed by the professional should be based on a theoretical knowledge and research; second, there should be an "overriding commitment [on the part of the members of a profession] to the well-being of their clients"; and third, that "to ensure that they can always act in the interest of their

clients, members of a profession reserve the right to make autonomous judgments free from external non-professional controls and constraints" (1986:8).

According to Carr and Kemmis, a review of the educational practice reveals the limited extent to which these criteria are fulfilled. Theory and research play a less important role in teaching than in other professions; the student-teacher relationship hardly conforms to the 'client-service' model; and many if not most teachers have little professional autonomy in the organisational context when compared to other professionals of different fields. "What all of this suggests", the authors say, is that

> if teaching is to become a more genuinely professional activity, three sorts of development will be necessary. First, the attitudes and practices of teachers must become more firmly grounded in educational theory and research. Secondly, the professional autonomy of teachers must be extended to include the opportunity to participate in the decisions that are made about the broader educational context within which they operate; that is, professional autonomy must be regarded as collective, as well as an individual matter. Thirdly, the professional responsibilities of the teacher must be extended so as to include a professional obligation to interested parties in the community at large" (1986:9).

Especially the first criterion of professionalism-- that the methods and procedures employed by the professional should be based on a theoretical knowledge and research-- seems useful for the purpose of my own investigation. However, the rest of Carr and Kemmis's criteria are influenced by a highly questionable discourse. To begin with, their second criterion adopts a market metaphor to describe professionalism professionalism. Doing so transposes what are essentially Neo-liberal market metaphors to the context of education. These metaphors do not adequately describe the educational process, which operates on the basis of rules that are quite different from those which govern a client-server relationship. Furthermore, they arguably introduce 'imported' forms of practice to the educational organisation which actually *undermine* the social relations of the organisation.

Carr and Kemmis's third criterion can be critiqued on the basis of a critique of professional discourses as the symbolic basis of professional ideologies: that is, they are discursive means of developing or maintaining relations of domination in professional fields of interaction (cf. Thompson 1990; I will say more about ideology below). According to this view, professionalism can *itself* serve to constrain the autonomy of "professionals". This is not something which Carr and Kemmis acknowledge, and will lead me to propose a reinterpretation of their concept of professionalism later in this appendix.

2. The critique of technical and practical approaches to educational research

Professionalism in education requires educational research. But what is educational research? And how can such research be conducive to an educational praxis? These are the central questions which Carr and Kemmis attempt to answer in Becoming Critical. Their answers are greatly indebted to hermeneutic critiques of positivism in educational research, and critical hermeneutic critiques of hermeneutics in educational research. For this reason, in the present section I will review in turn, Carr and Kemmis's critiques of the positivist (or technical) and interpretive (or practical-hermeneutic) approaches to educational theory and practice.

In order to lay a foundation for their own epistemological framework, Carr and Kemmis begin by examining the strengths and weaknesses of the dominant paradigms in educational research. They begin with an analysis of positivist or "natural science" approaches. The "natural science" approach to teaching is based on the principle that doing educational research is a matter of applying social science concepts, theories, and methodologies in educational research. This approach has at least two variations: on the one hand, there are those who advocate the "engineering view" of educational research, according to which the task of educational research is to develop an "educational technology in which appropriate psychological knowledge is applied to the practical tasks of teaching and classroom organisation"(1986:56-57). The most notorious example of this approach is found in the work of B.F. Skinner (1968), who attempt to apply behaviourist principles in the development of a stimulus-response model of learning.

On the other hand, those advocating what Carr and Kemmis refer to as the "medicine model" interpret the concept of application (of science) in terms of the identification of general laws which govern educational situations, and which define the parameters within which teachers can operate. According to the approach, the task of the educational practitioner is not unlike that of the medical practitioner: in proposing a practice, s/he must take into account the relevant laws (psychological, sociological or other) which operate in the field. Carr and Kemmis suggest that this medical analogy is at the heart of efforts to apply functionalist forms of the sociology of education[4].

Carr and Kemmis note that embedded in both of these "variants" there is what Habermas (1972) has described as a technical knowledge-constitutive interest: an interest in acquiring knowledge about something in order to control and manipulate it. In keeping with this interest, the epistemology of such research is a positivist one. In general, positivists advocate the use of a

natural science model of explanation for the social sciences. The natural science model involved is based on what Kolakowski (1972) has called the rule of phenomenalism, and on the hypothetico-deductive method. The first denies the validity of any knowledge not derived from sensory experience; the second regards logical deduction, and hypothesis testing as the "proper" scientific methods. Positivist approaches are thus empiricist, and treat social research as a deductive process of hypothesis testing, whereby efforts are made to explain a dependent variable (Y) in terms of an independent variable or variables (X) in causal terms: X produces Y.

The results of this type of research are used to discover and explain causal laws that apply to all similar contexts (X produces Y in all Z contexts). Such explanations are meant to enable researchers to predict, and thereby begin to manipulate and control social events (e.g. by removing the causes of Y). As applied to educational practice, this epistemology is meant to produce knowledge which serves to predict and provide practical control over the educational process (Fay 1977)[5]. As Carr and Kemmis put it,

> ... it is the predictive value of scientific theories that give them their practical value for, by laying the foundations for the manipulation of educational situations, they provide the opportunity for bringing about desirable educational goals. Thus, educational theory guides practice by making predictions about what would happen if some aspects of an educational situation were modified. On the basis of these predictions it becomes possible, by manipulating a particular set of variables, to control events so that desirable goals are achieved and undesirable consequences eliminated (1986:67).

Though positivism recognises that the ends of social processes involve values, it suggests that the most effective *means* to achieve these ends can be researched, and implemented in value-free ways. This radical distinction between means and ends is what was earlier referred to as the instrumental reason. It is an "internal" requirement of a positivist approach to "policy science". This to the extent that the epistemology of positivism precludes research that is based on values. From the positivist perspective, valid research can be produced only if the research is "value-free". Hence, the need to research and implement those "aspects" of educational practice which can be objectified in "value-free" ways.

Positivist approaches in general have been critiqued for a number of reasons. Carr and Kemmis use the work of T. Kuhn (1970) to critique positivism's underlying assumption that the scientific process involves the continuous accumulation of factual knowledge about the world. They also critique

the instrumentality of the technical-positivist conception of theory and practice: "As far as education is concerned, any attempt to relate theory and practice to a simple division between facts and values always makes some appeal to the sort of value-laden considerations that it was designed to eliminate (1986:75-76)". They also critique the inherent conservatism of an approach based on the assumption that an educational context is governed by general, unchanging "laws": educational research governed by this approach "can only function by presuming that those aspects of educational situations that are governed by these 'laws' are beyond control and, consequently, that any research recommendations the research supports will have to accept that certain basic features of education are unalterable"(1986:78-79).

Despite the importance of these problems, Carr and Kemmis present the most fundamental critique of the technical approach to educational research when they describe the basic tenets of what they call the **interpretive** or hermeneutic approach. In the educational context, this approach arose as a response to the problematic nature of the positivist forms of sociology of education. However, the work of interpretive scholars like M.F.D. Young and others (1971) actually drew on a rich tradition known as hermeneutics. Hermeneutics was developed initially in the domain of theology (the exegesis of sacred texts) and philosophy (the philosophy of language and of history). Towards the end of the nineteenth century, hermeneutic problems began to concern social theorists like Max Weber (1964).

The critiques of positivism put forward by hermeneuticians can be represented as follows. Epistemologically speaking, the positivist approach is built around a dichotomous approach to the question of the researching subject, and the researched object. It assumes that the object of research in the human social world is like objects of research in the natural world. This overlooks the fact that in the human social world, researched objects are also interpreting subjects which can and do act on the basis of their understandings of the world. This social fact suggests that the research objects are also knowing *subjects* . This in turn suggests that the actions of these objects-subjects must be interpreted at least in part with reference to the motives, intentions, and "subjective meanings" which guide them.

To be sure, explaining these motives, intentions, and "subjective meanings" is not itself a matter which can be tackled in terms of what I described above as the rule of phenomenalism. The actions, like the motives, intentions or other meanings, are expressed by symbolic means or forms. Explaining these calls for an act of interpretation which is irreducible to the empiricist requirements of positivism (Geertz 1973). Moreover, the "logic" of these ac-

tions is also irreducible to the logic of causality: motives, intentions and meanings are as much at work in any social action, as are "causal factors". To be sure, the causal explanation of actions in the social world presupposes an initial understanding of the web of social meanings in which it is possible to begin objectifying "independent variables" in the first place (Ricoeur 1986). This last point begins to explain why it is also an error to explain the motives, intentions, and meanings of individual actions in "private", individually psychological terms: the actions of individuals, like their meanings, are never private in the sense that they are "contained" within the "mind" or even the individual history of the individual. To the extent that meaning is public, and that actions are always governed by meaningful "rules of interpretation", then it follows that the individual act should be treated as a *social* act[6].

This critique paves the way for an entirely different epistemology of social research. What Carr and Kemmis refer to as the interpretive approach seeks to "elucidate the intelligibility of human actions by clarifying the thinking by which they are informed and setting this in the context of social rules and forms of life in which they occur" (Carr & Kemmis 1986: 90). This in order to "explicate the basic conceptual schemes which structure the ways in which the actions, experiences and ways of life of those whom the social scientist observes are made intelligible" (1986:90). The aim in not ultimately to provide causal explanations or to discover general laws, but rather to "deepen and extend our knowledge of why social life is perceived and experienced in the way that it is" (1986:90).

This epistemology is accompanied by a different conception of the educational theory and practice problem, and thereby, of the role of educational research. As developed in educational research, the interpretive approach aims to make the meaning of actions "transparent" to the educational practitioners involved in these actions[7]. According to Carr and Kemmis, this enables a process of practical change in two ways: first, it serves to reduce problems of communication between the researcher and the researched by explaining the ways in which practitioners in particular situations make sense of what they are doing. Secondly, the accounts offered by the researcher may be conducive to a more reflexive, and self-reflexive approach on the part of the practitioners. The former is promoted to the extent that the concepts and explanations developed by the researcher are different from those of the practitioners themselves, and thereby promote an awareness of alternative ways of thinking. The latter occurs when the practitioner grows "more self-conscious about the basic pattern of thought in terms of which they usually make their own actions intelligible"(1986:91). To the extent that practices

are changed by changing the ways in which they are understood, then this constitutes a first, and fundamental step in the process of transformation of practice. Such an approach stands in stark contrast to the technical, for which the question of practitioners' beliefs is either not addressed, or is addressed in terms of an externalising logic of causality.

Despite the strengths of the interpretive approach, Carr and Kemmis suggest that this approach is itself problematic. Amongst other problems, they suggest first, that it is problematic to oppose too neatly the aims of "understanding" social actions (hermeneutic attitude) and "explaining" them (positivist attitude). "It is argued that the interpretive model neglects questions about the origins, causes, and results of actors adopting certain interpretations of their actions and social life, and neglects the crucial problems of social conflict and social change"(Carr and Kemmis 1968:95). This leads to a flawed conception to the extent that it neglects questions "about the relationships between individuals' interpretations and actions and external factors and circumstances" (1968:95). In particular, it neglects the explanation of the relationship between individual interpretations and social structures, which are not only produced by individuals, but also produce individuality. The problem is to avoid, as the French sociologist of culture Pierre Bourdieu (1990) might put it, a dichotomy of objectivism and subjectivism. The relationship between the "objective" and the "subjective" is dialectic, and any "interpretive" approach which neglects the study of the former is as problematic as a positivist approach which neglects the latter.

Another criticism concerns what is now widely referred to as the "intentional fallacy". Even if it is true that individuals have motivations, it is not necessarily true that the outcome, or all of the outcomes of their actions are intentional. Hence, such outcomes cannot be explained exclusively by reference to the intentions of the individuals concerned. Yet some of these consequences, however "unintended", may help to maintain certain aspects of a social system by reinforcing the views and actions of other social groups. "In investigating this possibility," Carr and Kemmis suggest, "social science will need to construct theoretical accounts which attempt to explain the continuing existence of some institutionalised social activity..." by "...demonstrating the contribution that the unintended results of such activities make to the continuity and stability of the social system that produced and preserves them" (1968:96).

Finally, there is the question of the inertia of tradition, in relation to theory and practice. Changes in the cultural beliefs and discourses amongst practitioners do not depend exclusively on purely rational considerations.

These beliefs and discourses are related to "ways of life", and with them habits, traditions, and relations of power which may be threatened by alternative accounts of the meaning of a certain practice. "Far from changing individual's conceptions of themselves or others, any new interpretations will be perceived as an emotional threat to the individual's self-concept and discarded as 'unrealistic', 'ridiculous' or 'irrelevant'" (1968:97). Although interpretive approaches have generated an awareness of the historicity of all understandings, they fail to explain the ideologised nature of some of these, and indeed, they fail to propose ways of overcoming the relations of domination sustained by traditions. Failure to deal with these questions almost certainly guarantees that interpretative theories will be unable to produce the practical effects which they lay claim to.

I would now like to critique this critique. While I accept the authors' critique of positivist approaches to educational research, I find that Carr and Kemmis' critique of interpretive approach is more problematic. This critique, like the proposals that the authors adopt to mediate the problems of interpretive research (cf. following sections), is much indebted to the German philosopher Jürgen Habermas. It is thus unsurprising that their critique adheres quite closely to the one offered by the Habermasian "Critical Hermeneutics"[8]. It is for this reason also unsurprising that Carr and Kemmis do not mention the more recent work of hermeneuticians like Paul Ricoeur (1981), who propose ways of overcoming the opposition between explanation and understanding, and who stand somewhere in between the position of Habermas and more traditional hermeneutic theorists.

To be sure, it cannot be argued that this effort to synthesise the attitudes of "understanding" and "explanation" is entirely recent. Although certain key hermeneuticians *have* radically opposed the method of the human and the natural sciences[9], Weber himself, the precursor of the so-called interpretive sociology, did not oppose explanation and understanding. Nor did he construe meaning in terms of empathy or intuition, or argue that the subjectively "intended" meaning was necessarily the meaning which *actually* determined the relevant action[10]. Furthermore, Weber was aware that the individual is not necessarily *conscious* of his/her effective motives of action[11].

It would appear, then, that Carr and Kemmis are either speaking more about problems in *educational* research along interpretive lines; or that they have simplified the complexity of the fields and works which they unify under the label of "interpretive" approaches; or both. It is tempting to speculate that this may be the result of a conscious strategy which tries to make an enormous amount of research history and complexity available to readers

with relatively little research expertise. Useful as this may be, it is an unfortunate process to the extent that it seems to close the door on what might otherwise be regarded as being potentially fruitful avenues for educational research.

3. Towards a "post-empiricist" epistemology of educational research

I have explained that Carr and Kemmis are critical with respect to the strengths and limitations of both positivist and interpretive forms of educational research. This review, however, does not itself explain what is properly "educational" research. This is a question which the authors answer in later chapters, and with reference to a series of distinctions which, as their own self-classification begins to suggest, are much indebted to empiricism.

A fundamental distinction-- perhaps *the* fundamental distinction-- which Carr and Kemmis employ to build their own epistemological framework is G. Langford's (1973) schema for the identification of so-called theoretical, and practical activities. Langford's schema distinguishes between theoretical activities, whose overall purpose is to discover truth (examples of this being physics and psychology); and practical activities, whose overall purpose is to bring about change (examples of this being gardening, farming, teaching). Education, Carr and Kemmis suggest, is a practical activity inasmuch as its end is the bringing about of change in education. Recognising that education is a practical activity precludes on the one hand, the *application* of theoretical approaches from other disciplines, especially those which are meant to guide theoretical activities. On the other hand, it makes necessary a research that is practically orientated. According to the authors, it follows that "the testing ground for educational research is not its theoretical sophistication or its ability to conform to criteria derived from the social sciences, but rather its capacity to resolve educational problems and improve educational practice" (1968:109). These educational problems arise from discrepancies between the way in which practitioners conceive their educational activities, and what actually occurs in these practices. So practitioners must *already* have some interpretation of what is happening, or of what is supposed to happen, in the classroom. They must already have some system of beliefs, if not some "theory" that guides their educational work. Clearly, these implicit beliefs, or the educators' "theories" are not necessarily adequate, or accurate conceptions of what is happening in the classroom. But to the extent that it is in relation to these theories or conceptions or beliefs that problems are diagnosed,

they cannot be simply disregarded by educational research. On the contrary, they must be the point of departure of any research. Indeed, educational research must show *what* concepts, beliefs, customs or "theories" guide educational practice. However, to the extent that these may be problematic, it must *also* be prepared to critique them, and propose ways of changing them. While positivist approaches omit the first step (interpreting existing beliefs), interpretive or hermeneutic approaches fail to develop proposals for the second (transforming beliefs when they are incorrect).

How can this type of research be developed? Carr and Kemmis propose what they call a "post-empiricist" epistemology of educational science. This epistemology repudiates the positivist quest for certainty and absolute truth, and seeks instead a critical assessment of commonsense knowledge. It no longer views the social scientist as a spectator who discovers (as in positivist accounts of science), but as a human who explains the social world *even as s/he participates in it.* It rejects the logic of proof, and the hypothetico-deductive method as the sole distinguishing feature of scientific discourse. It favours instead, the notion of a process of enquiry governed by inter-subjective agreement on critical norms and standards of rationality. It thereby acknowledges the social, and historic nature of science itself. However, it also recognises the dangers of both a relativism and of an uncritical reproduction of the status quo, and insists on the need for a *scientific* critique of theoretical preconceptions of practitioners. These preconceptions tend to be the product of uncritical and non-reflexive habit, tradition or precedent, and thus may have to be changed. Hence the need for the development of a scientific approach to educational problems that both makes explicit these beliefs, customs or concepts, and emancipates educational practitioners from them. The last "by providing them with the skills and resources that will enable them to reflect upon and examine critically the inadequacies of different conceptions of educational practice" (1986:123).

In keeping with these proposals, and with the intended redefinition of the relationship between theory and practice, the authors propose a further distinction which is meant to banish the ghost of positivist "applicationism": applying "external" theories to describe a practice, with no reference to the practitioner's beliefs or actual practices. They distinguish between "applied" and "grounded" theory. While the first operates deductively, the second operates inductively. The *application* of existing theories and science can be a resource, *but not a source* of an educational science. This because existing theories tend either to address "theoretical" activities (Langford), or to address teaching problems without consulting the teachers' own concepts, beliefs or

interpretations of those problems.

What is needed, then, is a theory that is grounded in the practitioners' experiences. For this, Carr and Kemmis turn to Glaser and Strauss's (1967) notion of a *substantive grounded theory*. This notion suggests that researchers can generate concepts and hypotheses which are specific to a particular practice by substituting the generation of theory by logical *deduction* from *a priori* assumptions, with the *inductive* generation of theory from data produced systematically through research. Accordingly, Carr and Kemmis suggest that the problem for educational practitioners-as-researchers is not to use collected data to test existing scientific theory, but to generate theories on the basis of data which they produce when investigating "educational problems".

Crucially, Carr and Kemmis's proposal suggests that the research must be conducted by those who perceive, and are directly involved in the practical educational problems. In other words, the teachers themselves must conduct their own research, and they must develop their own categories and concepts. They must do so because it is difficult, if not impossible for "external" researchers to perform this task. Only the practitioner him or herself has a firsthand knowledge of the practice. Thus, "teachers themselves must become educational researchers, and professional researchers who are not teachers will only have a subsidiary role of supporting or facilitating teacher enquiry" (1968:127). This requirement will later form the basis for an educational form of action research.

In the light of these considerations, Carr and Kemmis draw up the following formal requirements for a specifically educational theory: First, educational theory must reject positivism, particularly the idea that knowledge has a purely instrumental value in solving educational problems that are (accordingly) conceived as having a technical nature. Second, educational theory must employ the interpretive categories of the teachers. Third, it must however distinguish between ideologically distorted, and non-distorted interpretations of the teachers, and it must also provide a method for overcoming distorted self-understanding. Fourth, the new approach must be able to identify and expose structures and processes in the social order which impede the pursuit of "rational goals", and must provide teachers with theories as to how these obstacles can be eliminated and overcome. And finally, fifth, there is "the need to recognise that educational theory is practical, in the sense that *the question of its educational status will be determined by the ways in which it relates to practice.*" (1968:130; emphasis in the original).

Undoubtedly, Carr and Kemmis's proposals constitute a sustained,

and coherent effort to develop a new epistemology of "practical" educational research. Even so, their proposals can be critiqued from a number of different perspectives. The first of these concerns the absence of any requirement concerning research about the *students'* beliefs and practices. It is true that the authors' proposals do not exclude the possibility of what I describe in the main text as "reception research" in education. Even so, it is significant that, aside from a passing (and problematic) reference to the professional need to serve clients, there is no mention whatsoever of the importance of taking into account the structures and practices of *learning*. These are arguably as constitutive of pedagogic communication as are the structures and practices of *teaching* : indeed, education is teaching and learning (cf. chapters one and four).

The second critique of Carr and Kemmis's approach is closer to the authors' own discourse: as the authors' own classification suggests, their approach is still very much under the influence of empiricism. This makes for some highly questionable distinctions. Carr and Kemmis rightly question the extent to which the application of sociological, psychological and other social science approaches can, in and of themselves, yield new forms of practice. However, their use of Langford's distinction between "theoretical" and "practical" research would appear to be a return to a position according to which interpretation and reinterpretation are not *themselves* regarded as actions. To the extent that this is the case, their position remains indebted to the worst forms of empiricism.

Their distinction also seems to oppose the quest for truth, and the quest for "solutions" to practical teaching problems. With Hammersley (1992), I would argue that even so-called "theoretical" research can be relevant for the practitioner, albeit in an indirect way.

It is true that the dangers of such a neat opposition between "theoretical" and "practical" research are in the end partly averted by Carr and Kemmis' adherence to the Habermasian notion of a Critical Social Science. This approach calls for both reinterpretation and "the organisation of enlightenment" (I shall explain this concept below). Even so, the overall empiricism of Carr and Kemmis' approach is confirmed by the authors' suggestion of the need for an approach based on Glaser and Strauss's (1967) notion of a substantive grounded theory. Although the call for an *inductive* approach of this type may be welcome-- teachers *do* need to start from their own problems and conceptions-- this approach nevertheless contradicts the very point made by Carr and Kemmis: that no problems are posed, and no data is collected, in the a-cultural, "neutral" fashion proposed by Glaser and Strauss

(1967). Indeed, up until the 1990's teachers for state schools were still required to have some form of training. Even though the professionalism of this training was being eroded by the State, the training still highlighted certain educational problems and not others, and frequently did so from the perspective of relatively explicit theories of education. This, if nothing else, constitutes the beginnings of a "theoretical" background which is likely to mediate any research carried out by educational practitioners (inductive or other).

Finally, and again with Hammersley (1992), I would argue that it is naive to privilege the practitioner as necessarily having access to information and insights which an outsider would never gain access to. As Hammersley says, it is a combination of involvement and estrangement which increases the chances of the research being valid; no position, inside or outside the research process, *guarantees* valid knowledge; and there are no overwhelming advantages to either position. "Each position has advantages *and* disadvantages, though these will take on slightly different weights, depending on the particular circumstances and purposes of the research" (Hammersley 1992:145).

4. A model for Educational Action Research

Thus far, I have critiqued the more general epistemological principles which underpin educational action research, as proposed by Carr and Kemmis. But what about the concrete methodology for this type of research? In the last chapters of Becoming Critical, Carr and Kemmis propose a relatively detailed model for Educational Action Research (E.A.R.). This model is organised largely, though not exclusively, along the lines of the Habermasian "Critical Social Science". Habermas's Critical Social Science is structured by a particular interest: an emancipatory (or critical hermeneutic) knowledge constitutive interest. According to Habermas (1972), the different types of enterprises of knowledge are guided, indeed constituted by particular "interests". The "technical" or "instrumental" interest governs "empirical-analytic" sciences and is associated with positivist epistemologies. According to Carr and Kemmis, forms of educational research based on this interest attempt to exploit the capacity for prediction and manipulation generated by the hypothetico-deductive methods. The "practical" interest (in the Kantian sense of the word "practical") guides the "historico-hermeneutic" sciences, and what Carr and Kemmis describe as "interpretive" forms of educational research. These seek to illuminate the conditions of inter-subjective communication. In contrast

the "emancipatory" interest, which is associated with the Habermasian "Critical Social Science", constitutes a liberating disposition, which attempts to emancipate the researcher (and researching community) from relations of domination. This is achieved by means of a process of ideology critique, which, by analogy to the therapeutic process of psychoanalysis, reveals how distortion in communication is the result of a repressive act on the part of an authority. If it is not possible to reveal this repression by ordinary dialogical means, then the critical social sciences must provide scientific explanations which enable the researching subject to free him or herself from dominating powers.

Carr and Kemmis argue that Educational Action Research should be structured on the basis of this last knowledge-constitutive interest. Accordingly, educational research should involve a process of ideology critique which enables the practitioners to overcome the distorted communication engendered by ideologies both within, and beyond the educational institutions. Important as this process is, Carr and Kemmis agree with Habermas when he suggests that critique is no more than a first step in the development of a *critical praxis* which can overcome the obstacles which prevent social transformation. To this end, the research process must be able to inter-relate the "theoretical" activities with the "practical" exigencies and challenges found in the institutional context. This can be achieved by means of the process that Habermas calls the "organisation of enlightenment". This process has three functions: to develop "true statements", or critical theorems which adhere to consensual standards of scientific discourse (here the criterion is one of truth); to apply and test these theorems through the initiation of processes of reflection within specific groups, for which the processes are directed (here the criteria are those of communicability, and authenticity); and finally, to guide the selection and use of appropriate strategies that should solve tactical questions and provide guide-lines for the conduct of political struggle (here the criterion is that the decisions must be the "prudent"). In this sense, the organisation of enlightenment attempts to articulate not just the principles of research itself, but of the appropriation of research within a practical process of ideological emancipation.

Carr and Kemmis suggest that such an "organisation of enlightenment" can be developed by means of an ideologically critical form of **action research**. They define action research as "a form of self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of these practices, and the situations in which the practices are carried out" (1968:162).

Action research requires the practitioners to work according to a "self-reflective spiral". Carr and Kemmis borrow this idea from the work of "action research" investigators in the 1950's[12]. The self-reflective spiral

> links reconstruction of the past with construction of a concrete and immediate future through action. And it links the discourse of those involved in the action with their practice in the social context. Taken together, these elements of the process create the conditions under which those involved can establish a programme of critical reflection both for the organisation of their own enlightenment and for the organisation of their own collaborative action for educational reform" (1986:187).

This spiral is presented schematically in the graphic below:

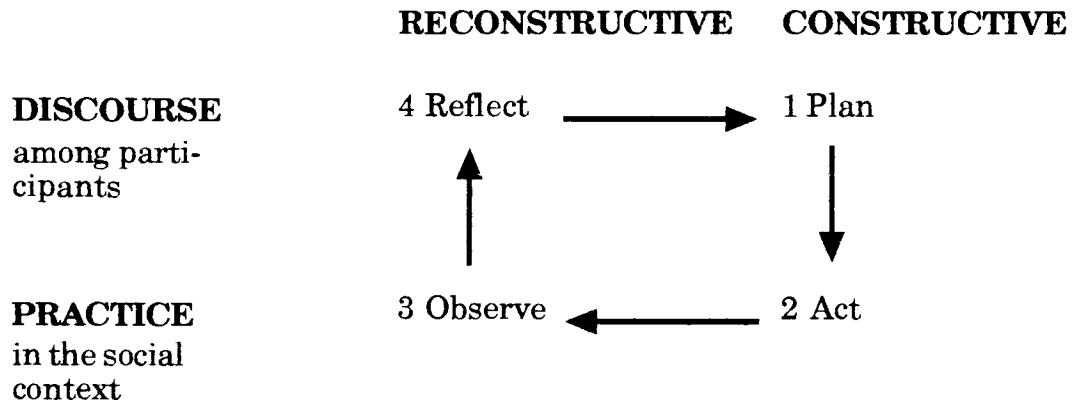

Figure 2. The Self-Reflective Spiral (In Carr & Kemmis 1986:186)

Carr and Kemmis' version of the self-reflective spiral is meant to guide the process of critical planning, development, and implementation of courses which build on the critical interpretation of previous experiences. According to this approach, educational planning

> is prospective to action, retrospectively constructed on the basis of reflection. Action is essentially risky, but is retrospectively guided by past reflection on which basis the plan was made and prospectively guided towards observation and the future reflection which will evaluate the problems and effects of the action. Observation is retrospective on the action being taken and prospective to reflection in which the action will be considered. Reflection is retrospective to the actions so far taken and prospective to new planning over previous actions" (1968:187).

Research operating within the self-reflective spiral must proceed according to what the authors refer to as a "dialectical conception of rationality". That is, their research must be governed by a "double dialectic" of theory

and practice, and individual and society. By this Carr and Kemmis mean firstly, that a dialectic tension needs to be maintained between between the practitioners' *theories and practices* in such a way that the two contribute to developing each other. This tension precludes the type of 'one way' exchange that positivism assumes (theory determines practice according to a priori assumptions, and according to unquestioned ends). But it also precludes the stagnant pragmatism assumed by those who simply don't "believe in theory". The second dialectic is based on the recognition that, while individual "subjective" beliefs are crucial to the construction of meaning, certain "objective" aspects of social situations do not depend on individual understandings. These understandings require both critique, and collaborative action over time and in relation to history in order to achieve a transformation of structural constraints.

The notion of "collaborative action" is itself central to the proposals of Carr and Kemmis. The self-reflective spiral must not be developed by individual scholars. Although it is crucial for practitioners to research their own practice, this research must be carried out in the context of a "*self-critical community* " of teachers which work jointly to develop the critical praxis. Such a community is crucial if the dangers of subjectivism, which are particularly great for a researcher acting in isolation, are to be averted. Carr and Kemmis authors admit that it may not be easy to develop such a collaboration, and such a community. "External" assistance might be required in order to get E.A.R. under way. However, these facilitators must constantly be aware that it is the practitioners themselves who must ultimately sustain and fulfil the different interests, amongst which the *emancipatory* is the ideal. Any efforts of educational reform that use forms of action research that are less than emancipatory (technical or practical) can be relevant, but should be expected to have effects that are limited by the kind of interest, knowledge, medium and science which guides them. For example, a technical interest in action research will lead to technical solutions which would leave untouched the practical and the emancipatory interests and problems. Even so, the authors (and indeed, Habermas himself) recognise that the other interests *can* be relevant and valid in certain instances, as a part of the process of attaining the ideal.

Carr and Kemmis suggest that self-critical communities should work to develop in a *systematic* manner the understandings of the teacher. To explain this point, a distinction is drawn between *practice*, *praxis*, and *personal knowledge*. While the first is habitual or customary action, the second is informed, committed action; and finally, *personal knowledge* is a rational com-

prehension of practice gained by way of systematic reflection of action by the self-reflective actor(s) involved. Self-critical communities should enable teachers to develop not just a praxis, but also, personal knowledge. The Habermasian criterion for judgment of whether or not this has been attained is one of authenticity: personal knowledge is authentic when it arises out of one's own rational reflection upon one's own considered action, and it is developed by discourse (also in the Habermasian sense of the term) in self-critical communities. Put succinctly, *action research aims to develop a praxis out of practice by increasing the personal knowledge of teacher-researchers.*

I shall now critique various aspects of these final proposals by Carr and Kemmis. I shall discuss first, the extent to which Carr and Kemmis contradict their call for substantive grounded theory by basing their proposals on the notion of the Habermasian Critical Social Science; second, the extent to which the authors have an overly optimistic faith in the capacity of practitioners to critically research their own practice; and third, the extent to which Carr and Kemmis base their approach on a problematic notion of ideology.

To begin with the first point: the authors' use of the Habermasian Critical Social Science contradicts their earlier call for research based on substantive grounded theory. The reader will recall that Carr and Kemmis use Glaser and Strauss's (1967) notion of substantive grounded theory to argue that educational action research should not be tied to the shackles of preexisting theories, concepts, or methods. But the authors appear to contradict this very principle by using the Habermasian epistemology of Critical Social Science for educational action research.

It might be argued that the proposal of an approach based on a substantive grounded theory is of a lower epistemological level and order than is the use of the model of the Habermasian Critical Social Science. Habermas's theory, it might be argued, is meant to provide an overarching epistemology. But even if this is the argument, the question remains: would such an overarching epistemology not ultimately guide, and even transform the nature of the observations made by the practitioner, thereby undoing the principle of a "substantive grounded theory"? If it does-- and I would argue that it does-- then the critique which I proposed earlier about the notion of "substantive grounded theory" is confirmed.

The next point is one which I began to discuss in section three, above, but which I wish to take up with reference to the problem of ideology. I am interested in the extent to which a teacher, working individually or as part of a collaborative community, can develop critical insights into her/his practice. As I've explained, Carr and Kemmis' approach calls for action research, as

distinct from research carried out by non-participant researchers. This approach is justified by the fact that the research is meant to yield "practical" results for the practitioners involved. But it is also justified by an appeal to what can be interpreted as the dehistoricizing tendency of any intervention on the part of researchers who do not belong to the historical practical process.

Taken singly, these justifications are clearly valid ones. However, they overlook a fundamental question: how and why would practitioners see the need for educational action research, let alone ideology-critique, in the first place? This question touches on a debate between those who insist on the importance of researching on the basis of a Levi-Straussian *bonne distance* ; and those who regard this *bonne distance* as a form of objectification which cannot produce valid interpretations of the researched process. Even after dismissing the positivist assumption that the researcher can or should remain in a completely "external" position to any social research process, the question remains: how can the practitioner produce the required interpretive break with the historicity of his/her own practices in order to engage in E.A.R.?

Carr and Kemmis make two suggestions: the first is that there may be the need, initially, for an "external facilitator". But if this is the case, is it not true that a degree of 'externality' is required to guarantee that the action research process is critical in the methodological and ideological sense of the term? Carr and Kemmis' second suggestion is that the research should be conducted by means of what they call a "self-critical community". This type of community, they argue, can develop a reflexive, and self-reflexive process of educational transformation if it engages in ideology critique, and the "organisation of enlightenment". In effect, Carr and Kemmis assume that a group of practitioners is more likely to be reflexive, and self-reflexive than is an individual practitioner. But the authors do not adequately explain what happens if the *entire group* is driven by ideologised forms of communication, or indeed, if different parts of the group oppose each other on grounds which are themselves ideologised.

My last critique of Carr and Kemmis' work concerns their conceptualisation of ideology. To begin with, it is worth noting that Carr and Kemmis actually work with two *different* theories of ideology. One is the Habermasian: ideology as "distorted" communication. The other is closer to what J.B. Thompson (1990) has described as a "social cement" or "neutral" conception of ideology: "a corpus of ideas or a pattern of thinking, [that] is the cognitive residue of the practices of social, cultural, and economic relationships which

sustain society (Carr & Kemmis 1986:193). These two conceptions are different, but the authors do not seem to be aware of the differences, or the practical implications of the differences.

For the most part, Carr and Kemmis adhere to the Habermasian notion of ideology as "distorted" communication. I will thus concentrate on critiquing this, and not the other approach[13]. The basis for this conception of ideology is the Habermasian regulative ideal of free communication as communication which is not constrained, or dominated by the violence of authority[14]. Habermas' argument is that such a regulative ideal is inherent to rationality; and that such an ideal, when developed critically, can be used to free "distorted" communication from the violence of authority.

This approach to ideology has been rightly questioned by numerous scholars. It is one thing to recognise that all theories of ideology must ultimately assume a utopian nowhere-- the nowhere where no ideology exists. This is the position from which the critique of ideology must, theoretically, be made (Ricoeur 1986). (Here it worth noting that any denial of the need for such a utopian nowhere is ultimately based on a conservative discourse.) But it is quite another thing to suggest that rationality is itself essentially democratic. Here, Habermas has been rightly critiqued for the extent to which his entire approach is based upon the Enlightenment project's irrational faith in the benign power of rationality[15].

Another equally important question with respect to the Habermasian concept of ideology is that it fails to consider ideology as a *relation* of domination. As long as ideology is reified as "distorted communication", it is impossible to theorise the ideological process as one which operates by means of a complex, and meaningful *interaction* between individuals and social groups. Indeed, terms like "distortion" and "bias" constitute an appeal to dichotomous, and ultimately positivist notions of truth. This is also a problem which a number of authors have critiqued[16]. Ideology, they argue, if first and foremost a semiotic process. This to the extent that it works by means of symbolic forms which are always interpretive and which in turn must always be interpreted. It is thus not possible to reduce their meaning to a simple, digital evaluation of truth or falsehood.

As an alternative, some authors have proposed that ideology should be conceptualised in terms of meaning, and domination. For example, Thompson (1990) conceptualises ideology as meaning which serves to develop or sustain relations of domination. Although this definition still posits the (utopian) existence of meaning which does *not* serve ideological purposes, it moves away from the vicissitudes of the dichotomous or "digital" category of distortion. It

also suggests that the key to ideology critique is not so much a "therapeutic" process of revealing repressed actions of (violent) authority, as it is a process of critical discourse analysis which reveals how and why meaning serves to maintain durably asymmetrical relations of power (Thompson 1990) between individuals, and social groups.

5. Towards a Social Semiotic form of Educational Action Research

In this last section, I shall explain how I plan to develop an alternative form of educational action research.

I shall begin with Carr and Kemmis' appeal to the need for professionalism as the primary justification for educational action research. I explained earlier in this appendix why the authors' definition of professionalism is problematic. While I accept Carr and Kemmis' first criterion-- that practice should be based on a reflexive disposition towards practice-- I explained above why I do not believe that their other criteria are valid. It is not valid to assume, as Carr and Kemmis implicitly do, that professionalism cannot itself be ideologised. In addition, the 'client-server' model constitutes a highly problematic extension of the market metaphor. For this reason, I shall argue that it is necessary to substitute the 'client-server' model of professionalism with one which recognises that professionalism requires an ideologically critical commitment to the educational process, and therein, to the **educands.**

This position entails two key shifts vis-a-vis the proposals of Carr and Kemmis: first, it highlights the need for *ideologically critical* forms of professionalism. This inasmuch as professional discourses may themselves serve to develop and maintain relations of domination. Second, to speak of educands, and not of clients, involves much more than a 'semantic' shift. As I explain in chapter one, pedagogic communication has its own rules of interaction, which cannot be reduced to an economic exchange. Moreover, to regard the student as a 'client' makes it discursively impossible to conceive that students may learn in ways that are themselves affected by educational ideologies, or by broader cultural ideologies. Put in the terms of the client-server model, the client is *not* always right.

Reinterpreted in this fashion, these criteria for professionalism seem relevant to the educational field I am concerned with: combined (theory and practice) courses in media studies, and therein, the BA (Hons) in Science, Culture, and Communication (SCC). Until recently, relatively little effort was

devoted to developing *educational* professionalism in higher education in the UK, in general. Teaching in higher education has tended to be based on the assumption that the relative biographical maturity of educands in higher education absolves universities from requiring specifically *educational* professionalism on the part of its educators. This assumption is a mistaken one. The greater age of students does not eliminate the need for educational professionalism; it simply changes the nature and level of the educational problems that educators must tackle.

A related, and equally mistaken assumption is that the lecturer's professionalism in *research* guaranties, or at least lessens the need for educational professionalism. But of course, a competent researcher is not necessarily a competent lecturer. Indeed, in my personal experience it is quite often the case that lecturers are competent in one, but not both, activities.

Now, it is true that in recent years there has been a greater interest in educational professionalism in the field of higher education. A number of different factors would appear to have given rise to this increased interest. The dramatic rise in student numbers; the very rapid, and nearly simultaneous adoption of modular schemes in the field of higher education; a drastic decrease in funding; and finally, the imperialist nature of the new managerial ideologies have prompted much debate over ways to maintain and even increase the "quality" and "cost effectiveness" of the educational process. Indeed, a review of journals of higher education over the last ten years reveals a crescendo of articles devoted to debates on the "quality" of education[17]. This new concern with quality would be welcome were it not for the fact that it is largely driven by the same discourse which I critiqued in Carr and Kemmis: the effort to transform universities on the basis of the market metaphor. To the extent that this discourse has developed the interests, values and meanings of the dominant institutions and social groups in Britain in the 1990's, and has excluded other interests, values, and meanings, it constitutes an ideologised form of professionalism.

An intimately related problem with the recent shift towards greater professionalism in higher education is that much of it has been influenced by instrumental forms of reasoning. Although a number of higher education teaching "primers" have been published which tell lecturers how to deal with large classes, with modularisation and other aspects of mass education[18], most are concerned with educational means, and say little or nothing about educational ends. Like the grand theories of education, most are not based on educational research, let alone ideologically critical research, into any particular context. For all of these reasons, I shall argue that the current trend to-

wards professionalism is an ideologised one, and one that fails to satisfy the criteria for professionalism which I have proposed in this appendix.

Now it may seem that combined courses in media studies are an exception to the scenario described above. It may seem that the general lack of educational professionalism, and of ideologically critical forms of education in higher education is more than offset by this field's commitment to critical practice; and by this field's critical research into questions involving the production, construction, and reception of social discourse in the mass media. In my experience, many lecturers in the media and cultural studies do tend to assume that this is the case[19].

This belief, however, is itself based on a highly questionable assumption: that the social theory at the heart of media and cultural studies makes lecturers in media and cultural studies 'naturally' reflexive and self-reflexive with respect to teaching practice. But I would argue that a lecturer who is reflexive with respect to media and cultural discourses is not necessarily reflexive, let alone self-reflexive, with respect to *pedagogic* discourse. I explain in chapter one that pedagogic discourse requires a highly specific form and level of theorisation. This form is absent from any of the current approaches in media and cultural studies.

It may seem, finally, that within media studies, the field of research known as media education *has* theorised pedagogic communication, and therein, pedagogic discourse. It is true that researchers working in media education have done much to promote debate about the nature and role of media education (and education in the media). Len Masterman's (1980) Teaching Television and M. Alvarado et al's (1987) Learning the Media, to name just two seminal texts, propose explicit educational aims and objectives for educational practitioners in media education. In addition, these and other authors articulate educational means with educational ends to the extent that they also describe specific contents and forms with which to help young people to develop ideologically critical reading skills. I shall nevertheless argue that, for my own purposes, this work is inadequate.

First, the majority of scholars in media education have centred on educational questions arising in primary, secondary, and to a lesser degree, further education contexts. As a result, much-- though certainly not all-- of what has been proposed in media education addresses questions that arise in those contexts, and not in *combined* courses in *higher* education. This distinction is of considerable significance because there are important differences between the primary, secondary, and further education contexts, on the one hand, and the higher educational context, on the other. I explained above that these dif-

ferences should not be considered in terms of an inverse relation between age and the need for educational mediations. Instead, they should be considered in terms of differing curricular aims, contents, and forms; differing educational institutions; and last but certainly not least, differing student responses and relations to the educational institutions.

Media education is also inadequate for my own purposes because researchers in this field have been concerned almost exclusively with questions involving the *reception* of media texts by young educands. This is true even of those authors who treated practical work in Further Education as a form of reception of the mass media. In keeping with this preoccupation with the reception dynamic, most of the practical educational proposals have been concerned with developing so-called critical media reading skills. Although this research is undoubtedly full of potential, I explained in the introduction of this thesis that the characteristic feature of combined courses is that they mix the teaching of media studies with the teaching of media production. Many, though certainly not all of them, do so with the aim of preparing educands for professional work in diverse media, or media-related industries. To be sure, many if not most of the educands attending combined courses expect to emerge from the combined degrees with the capacity to compete for jobs in the media, or media-related industry. This means that from the perspective of combined courses in higher education, the "specialisation" of media education in matters concerning the reception of the media leaves an explanatory gap. Media education fails to explain-- perhaps because given its scope, it does not *need* to explain-- questions and problems arising with respect to the development of a praxis in media production.

Last but certainly not least, proposals like Masterman's and Alvarado's are not actually based on research into the *educational* process. They constitute efforts to transform media studies into a *pedagogy* of media studies, on the basis of one or another "grand theory" of education: for example, Len Masterman uses Paulo Freire's (1972) pedagogy for the liberation of the oppressed. To the extent that the authors do not formulate their proposals on the basis of educational research into concrete educational contexts, then their work cannot be considered as being sufficiently critical to warrant classification as a proposal for a truly critical pedagogic praxis.

These three limitations-- the difference in level (university), the difference with respect to the production dimension, and the failure to base practical pedagogic proposals on *educational* research-- greatly limit the contribution that media education can make to the professionalism of lecturers in higher education courses. I shall thus argue that educational research is nee-

ded which addresses the specific properties of the educational field in question: combined degrees in media studies.

What form of research, then, *can* be used to develop a more critical educational praxis, which is conducive to the learning of media production praxis?

I accept Carr and Kemmis' critique of technical forms of educational research, and I accept their call for research which privileges the interpretive categories of the educators. I also agree with Carr and Kemmis that it is of fundamental importance to be critical with respect to practitioners' interpretations. This entails showing when and why practitioners' interpretations are not valid, and especially, when and why they are ideologised. However, I do not agree with Carr and Kemmis that the practitioner him or herself is necessarily the best person to conduct this research. S/he *may* be, but as Hammersely explains, this position entails both advantages and disadvantages. I do not believe either that it is possible or desirable to oppose as neatly as Langford (1973) does, so-called theoretical and practical research. Finally, I do not accept that the categories of research should necessarily be generated in the manner suggested by Glaser and Strauss (1967). I will suggest alternatives to each in the paragraphs that follow.

Where the privileging of the practitioner's insights is concerned, I agreed earlier with Hammersley (1992) that neither the "insider" nor the "outsider" position guarantee valid research results in any given context. To be sure, I wish to argue that in the current investigation, my relation to the SCC degree breaks down the dichotomy of "external" and "internal" researcher proposed by Carr and Kemmis. I am partly "external" to the SCC degree to the extent that I arrived to the University after the degree had been designed, and one year after it had begun to run. SCC was, and remains, in this sense, the project of other practitioners. I can also be classed as an 'outsider' thanks to the fact that I am a Colombian citizen with Swedish parents, and have lived and worked most of my life in non-English cultural and institutional contexts. This means that I bring to the educational institution the distance that results from a familiarity with very different cultural and educational traditions.

Having said this, it is nevertheless true that I *did* begin to teach in SCC, and thus became a part of the educational process which I am now researching. In this sense, it would be absurd to deny that I am and remain, very much an 'insider'. I am thus an insider in some respects, and an 'outsider' in others.

It is tempting to signal the absolute advantage of one or the other posi-

tion. Instead, and in keeping with what I argued earlier, I shall propose that each of these positions has its advantages and disadvantages. My relative externality to the SCC curriculum, and many of its underlying assumptions undoubtedly enables me to take a critical distance without which this investigation, in its current form, would not be possible. At the same time, the fact that I am not English means that much of the culture, and the educational culture remains strange to me. What from one perspective can be perceived as productive distanciation, can from another be perceived as cultural estrangement.

The same is true of my "insider" status as a lecturer on the degree. The fact that I am actually teaching within SCC, and that I will be researching the context in which I teach means that I cannot have the *bonne distance*, especially vis-a-vis my own teaching, that might be expected from an external researcher. As I explained in the introduction to this thesis, I fully expect that a number of aspects of my own teaching, and of course of my own subjectivity will remain 'transparent' to me, in the sense that I will remain unaware of them. However, being a lecturer in SCC also means that I have the kind of access to texts, documents, and dynamics which an external researcher would have great difficulties in obtaining, if s/he could obtain them at all.

I am thus arguing that my position within SCC cannot be classified simply as being that of an "insider" or of an "outsider". I am also arguing that it is not productive to endorse, without much qualification, either of these positions. Indeed, I propose that the practitioner's research of his or her own practice should be treated not as a methodological *sine qua non* for "practical research", but rather as an option which has both advantages and disadvantages.

I suggest, finally, that in my particular case the disadvantages associated with doing research about one's own practice (primarily, the lack of *bonne distance*) are partially ameliorated by the fact that I am conducting my research both to transform by own practice, *and* to obtain a Ph.D. Conducting educational action research as part of a Ph.D process means that I must engage in both face to face, and "textual" dialogue with at least three other readers: the Ph.D tutor, and of course the two Ph.D examiners. This, I would argue, forces me to engage in a relatively public process of research, which is quite different from one in which the practitioner simply researches for her/his own purposes, in 'private'.

I now wish to move on to the question of the opposition between so-called practical and theoretical research. I do not accept the opposition of theoretical and practical theory (Langford 1973). As I explained earlier, this

opposition is problematic because it opposes the criterion of validity with the criterion of relevance. Even research with practical implications should be concerned with producing truthful statements; moreover, I agree with Hammersley (1992) that even so-called "theoretical" research can have relevance, albeit indirect relevance, for practical educational processes. As I explain in the concluding chapter, "theoretical" research *can* be used to transform one's practice, provided it is made clear that the transformation entails a recontextualization (cf. chapter one) of the theories and findings used in the research.

A similar critique applies to the viability of "substantive grounded theory" (Glaser and Strauss 1967). I have argued above that this proposal is ultimately an untennable one on epistemological grounds. However, it is particularly problematic in those cases where the educational practitioner is already a researcher, as is my case and as frequently happens with educational practitioners in higher education. Even after recognising that media and cultural studies cannot themselves provide the theoretical framework for my research, I cannot pretend to dismiss the more general theoretical displacements that are embedded in the latest approaches to media and cultural studies. Here I have in mind the privileging of cultural values and symbolic forms in all social processes; and thereby, my recognition of the importance of a methodology of research which is capable of explaining the meanings of meanings. These and many other fundamental positions are not positions which I can, or wish to discard. Doing so would not only entail the risk of reinventing the wheel, but of assuming that it is in fact possible to achieve the impossible: something like a research "degree-zero".

I thus propose instead to build on an existing theory and methodology for educational research. This theory and methodology is a **social semiotic** theory of pedagogic discourse, proposed and developed by Basil Bernstein, an English sociologist of education. I describe this theory and justify its use in detail in chapter one. Here I simply wish to note that I was first drawn to Bernstein's theory when a colleague suggested that my own initial theorisation of pedagogic communication resembled Bernstein's work on pedagogic discourse. Reading through Bernstein's work, I discovered not only that there were important similarities, but that his work went far beyond my own, and explained precisely the phenomenon that I was trying to articulate. I would argue that this process of discovery of a suitable, preexisting theory is not one that is contemplated by Carr and Kemmis' approach. Yet I hope to show in the main text that it makes not just for critical action research, but for far more critical action research than would otherwise have been the case.

Notes

[1] See for example, Freire (1972).
[2] For examples of these different methodologies, see Schön (1991).
[3] This definition was agreed upon by participants in a seminar on Action Research held at Deakin University in 1981. The authors cite L. Brown *et al.* (1981) 'Action research: notes on the national seminar', School of Education, Deakin University (mimeo).
[4] As an example, the authors cite the work of O. Banks (1976).
[5] This is what Fay (1977) calls "policy science".
[6] See Geertz (1973) for an excellent representation of the Wittgensteinian critique of private meaning theories.
[7] Different authors use the metaphor of transparency in different ways. In this context, the metaphor can be interpreted as signifying a process whereby implicit values are made explicit to their social agents.
[8] For a more valid comparison and contrast of hermeneutics and critical hermeneutics, albeit one which still favours the position of Habermas, see J. B. Thompson (1981).
[9] See for example H.G. Gadamer (1975).
[10] Weber (1968) even recognises that there may be a case for using functional explanation as an important *point of departure* in sociological accounts.
[11] See for example, D. Käsler (1988).
[12] In particular, the work of K. Lewin (1952).
[13] For a critique of the 'social cement' theory of ideology, see Thompson (1990).
[14] See Ricoeur (1981) for a Gadamerian critique of Habermas's linking of authority and violent domination.
[15] I cannot for reasons of space, rehearse the critiques that have been levelled at Habermas's faith in the enlightenment project. It suffices to say that during the 1960's, J. Habermas and H.G. Gadamer engaged in a now famous debate about the epistemological assumptions embedded in each other's philosophical approaches. At issue was whether or not it is possible to break with the history, and historicity of a social understanding in order to overcome ideologised understanding. Habermas argued that it was possible; Gadamer, that it wasn't. A later polemic, carried out in the 1980's between Habermas and Lyotard, concerned the extent to which Habermas' project was based on questionable "metanarratives". Lyotard (1984) questioned any science that legitimated itself "with reference to a metadiscourse (...) making an explicit appeal to some grand narrative, such as the dialects of Spirit, the hermeneutics of meaning, the emancipation of the rational or working subject, or the creation of wealth"(1984:xxiii). From this perspective, Habermas' discourse rests on a Modern "metanarrative" in which a "hero of knowledge" works to attain "a good ethico-political end--universal peace", or something very like it.
[16] See for example, Ricoeur (1986) and Thompson (1990).
[17] See for example, the special issue on "Managing Quality in Higher Education" in Higher Education, Vol. 25, No. 3, April 1993; and the special issue on "Quality and the management of quality" in Higher Education Quarterly, Vol. 46, No. 1, Winter 1992.
[18] See for example Gibbs & Habeshaw (1989); Newble & Cannon (1991); Gibbs & Jenkins (1992); Cox (1994).

[19] A statement made recently by E. A. Kaplan (1987) is an indirect example of this discourse. According to Kaplan, media scholars who eventually became interested in questions about the reception of the media "were 'naturally' concerned with *reception*, because they were addressing educands who were often quite young in terms of their reactions to television" (1987:212). Kaplan's statement, which appears in the context of an introduction to feminist media criticism, would appear to suggest that educators in media studies were[are] indeed 'naturally' concerned with the reception of their courses. This is a questionable assumption: some lecturers are not at all concerned with the whole reception dimension; and even those that are, are not necessarily critical with respect to this dimension.

Appendix II

Original SCC Course Description (Extracts)

The following pages contain extracts from the original SCC course description. This document was the one submitted to the University for approval of the degree. I have included only some extracts from this document, as most of the original documentation's information concerning the official structure of the course is reproduced in the Essential Papers (Appendix III).

A. Philosophy, Rationale, and Demand for the Course

A.1. The philosophy of this modular degree is premised on the conviction that in a period of rapid technological, environmental and social change, Science is too important to be left strictly to the specialists. This premise is one shared by important members of the academic and political community as evidenced by the recent pronouncements of the Royal Society, the British Society for the Advancement of Science, UNESCO, the DES and industrial organisations.[1] For example, a recent report from the Council for Industry and Education expressed the view that:

> Higher education, as a national asset, must maintain humane values and be strong in all its disciplines, while ensuring that the language and perspectives of mathematics, science and technology, essential for modern working life, are properly familiar to all those it educates.[2]

A.2. There is increasing evidence that the above premise is also shared by a growing section of the general public. Surveys undertaken by The New Scientist , The Committee for the Public Understanding of Science, and environmental pressure groups such as Greenpeace, all point to a growing dissatisfaction with the conception of Science as the specialists' preserve.[3] In a recent sixteen page "Science Extra" section of The Daily Telegraph, Steven Hawking, author of the best selling A Brief History of Time spoke of the importance to a democratic society of harnessing the evident public interest in Science by re-vitalising Science education. [4]

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[1]M. Elmandjra, "Fusion of Science and Culture: Key to the 21st Century, excerpted from the author's intervention at the Canadian Commission for Unesco's Symposium on Science and Culture for the 21st Century: Agenda for Survival in IFDA DOSSIER 77, May/June 1990.

[2]The Council for Industry and Education, Towards a Partnership--Higher Education, Government, Industry. (London 1987)

[3] J. R. Durant, "The Public Understanding of Science" in Nature, vol. 340, 6 July 1989.

[4] S. Hawking, "Awakening the Scientist in Us All", The Daily Telegraph Science Extra, 18 August 1990.

The growth of the feminist movement over the past twenty years has also produced wide-ranging and widely-disseminated critiques of Science as mystified and male dominated.[5] An undergraduate arts degree which aims to make its graduates both communicate effectively with the general public as well as with science specialists, directly confronts the apparent gulf currently existing between the so-called "Two Cultures."[6] And it does so by addressing in a sustained and substantive way, the all-pervasive interaction between scientific knowledge and policy and its cultural context.

"The age of 'Science for science's sake' and of 'art for art's sake' is over. The 21st century will call for a more socio-culturally determined paradigm which can no longer live under the illusion of the 'universality' and the 'neutrality' of science and technology....This is why the interfacing of science and culture and the necessity of their fusion has become a condition for communication and for survival."[7]

This degree examines that interface in both its historical and contemporary aspects.

A.2.1. At the same time, there is growing concern over the predicted shortage of science undergraduates in the mid-1990's.[8] In an effort to make Science Education more attractive as well as less narrow, the National Curriculum now requires that secondary students:

"be able to give an historical account of a change in accepted theory or explanation and demonstrate an understanding of its effects on people's lives-physically, socially, spiritually and morally..."[9]

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[5]Cf. S.Rosser, Female-friendly Science, Pergamon Press, N.Y. 1990, for an extensive bibliography on this issue.

[6] A recent editorial in the THES spoke of the need for Higher Education to bridge the gap since in fact the "Two Cultures" are thoroughly interpenetrated by Science and Social Values.

[7]E. Mlmandjra, op. cit. pp. 53-4.

[8]"Where are the new scientists?" by J. Turney in New Scientist 7 April 1990, p. 37 ff.

[9]From Science in the National Curriculum, (HMSO 1989). See "Science approaches point of no return" in THES 16 Nov. 1990

There is already an increasing number of students in the 16-18 age range who, being exposed to this broader conception of science education, and having taken their science 'A' levels in combination with non-science subjects[10] will come to Higher Education expecting to locate science in its cultural context.

At the same time, demographic pressures ensure that undergraduate science degrees will have to exploit new student markets, including mature, female and non-standard entrants if they are to survive into the next decade[11]. It is equally clear that with the continuing decline of the unit of resource less capital-intensive and more user-friendly ways of approaching science teaching must be developed This will mean new modes of course delivery as well as a re-evaluation of teaching strategies. The proposed degree, which is a joint venture between the Science and Humanities Departments, builds upon the latter Department's extensive experience in attracting and retaining mature, female and non-standard entrants.

A.2.2. Plans for a more systematic modularisation of Science and Humanities courses will eventually mean that some of the Science, Culture and Communication (SCC) components could be adapted for use by other degrees. Indeed, preliminary discussions to do just that are already underway.

A.2.3. We should make clear, however, that although we see this degree as a flagship for new approaches in the teaching and dissemination of Science within the Polytechnic and see its eventual integration within a wider modular strategy, we deem it essential that the course has a chance to run and develop on its own in the first few years. This will give the staff, who are after all, from widely divergent disciplines and teaching traditions, the chance to grow and experiment together. The proposed degree intends to pioneer new pedagogic styles which more specialist science courses at the Polytechnic could then adapt and incorporate.

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[10] See Appendix I

[11] "Get Thee to a Laboratory", by K. Gold in New Scientist, 14 April 1990, p. 42ff.

A.3.2. Whilst our enquiries have yielded no cast iron assurances that the course will recruit, it seems evident to us that the past decade has seen a sea change in public attitudes toward the need for scientific education. This degree, designed as it is to attract those with both science and arts qualifications, should be able to exploit this change in public attitudes.

A.3.2.1. The proposed degree would be unique in Britain. There are Science Journalism degrees in the USA (at for example The University of California at Santa Cruz) and there are "Science and Society" pathways and combined Studies degree at a limited range of British Polytechnics and Universities (e.g. Middlesex Polytechnic, The University of Edinburgh and Manchester Polytechnic). The University of Manchester is attempting to expand its B.Sc. in the Life Sciences to include a history of Science component. None of these British initiatives offer our particular emphasis on transferable communication skills and media analyses. Nor do they, despite the burgeoning popularity of Women's Studies attempt to incorporate, as this degree has, a recognition of the importance of gender issues to the study of Science.

A.3.2.2. Recent changes in "A" and "GCSE" science syllabi towards a more integrative and socially aware science curriculum are designed to disseminate basic science education more widely. We conclude that there will therefore be an increasing number of potential students with general science qualifications who though they do not wish to be specialist scientists may still retain an interest in the subject area. Even at present we suspect there are students with Science qualifications who do not go in for straight Science degrees but who may be attracted to a more broadly and socially oriented Science course. (For example, of the 112 students admitted to the B.A. Humanities Degree in 1989, 106 had a Science "O" level and 15 possessed at least one Science "A" Level.). These considerations, plus the attractiveness of the communications element of the proposed degree make us feel confident in its recruitment potential.

A.3.2.3. Our graduates would be particularly attractive to employers offering jobs where both scientific competence and communication skills are required, e.g. science related administrative posts in the Civil Service and regional and local authorities; public relations and related managerial posts in engineering and science oriented industries; posts in science journalism (including broadcast journalism), environmental lobbying and education groups, teaching and museum work.

A.3.3. Upon validation of our course, we intend to stage a series of Sixth Form Conferences, Extra Mural Day Schools and Staff Development Seminars in order to market it most effectively.

Appendix III

SCC "Essential Papers"

The following pages reproduce the complete set of "Essential Papers" given to all SCC students and staff members at the beginning of the 1994/1995 academic year. The Essential Papers were, from the perspective of my research, the main para-curricular marker. They contained descriptions of each module, as well as key rules and regulations for the SCC degree. Many parts of the Essential Papers were exact reproductions of the SCC Original Course Description (cf. Appendix II). However, the Essential Papers also included amendments which lecturers introduced to the course since the course began in 1993. This was especially the case with some of the module descriptions.

The Essential Papers were produced each year by the Award Leader. However, each year the Award Leader asked SCC staff to amend module descriptions as necessary.

Contents

Part I

(Contents: Part 1 continued)

Part II

Part III

ABOUT THIS

THIS STUDENT HANDBOOK IS DESIGNED TO GIVE YOU ALL THE INFORMATION YOU NEED TO BE ABLE TO FOLLOW THE DEGREE SUCCESSFULLY.

IT IS IMPORTANT THAT YOU READ IT AT A VERY EARLY STAGE, BECAUSE IT CONTAINS ALL THE ESSENTIAL RULES BY WHICH THE SCHEME IS RUN. OBVIOUSLY IT WILL BE SUPPLEMENTED BY INDIVIDUAL MODULE PROGRAMMES, IN GREATER DETAIL.

KEEP IT AT HAND TO REFER TO THROUGHOUT THE YEAR. THE CALENDARS ARE ESPECIALLY USEFUL FOR PLANING YOUR TIME.

IF YOU HAVE ANY QUESTIONS ABOUT ANY ASPECT OF THESE ESSENTIAL PAPERS, PLEASE DON'T HESITATE TO ASK YOUR PERSONAL TUTOR OR ONE OF YOUR MODULE TUTORS.

COURSE HANDBOOK

PLEASE PAY PARTICULAR ATTENTION TO THE SECTIONS WHICH SET OUT ALL THE ASSESSMENT REGULATIONS. INEVITABLY THEY MUST SEEM A LITTLE FIERCE, BUT IT IS BETTER THAT YOU ARE CLEAR ABOUT THE RULES THAT GOVERN THE SCHEME RIGHT FROM THE BEGINNING. IN PARTICULAR WE WOULD LIKE YOU TO TAKE NOTE OF THE FOLLOWING PARTS:

- THE FORM IN WHICH WE EXPECT COURSEWORK TO BE SUBMITTED;
- THE PROCEDURES FOR HANDING IN COURSEWORK;
- THE DUE DATES FOR ALL COURSEWORK;
- THE RULES AND PROCEDURES GOVERNING ILLNESS AND ANY OTHER GROUNDS FOR SEEKING EXTENSIONS BEYOND THE DUE DATES;
- THE RULES GOVERNING LATE WORK.

IF YOU HAVE ANY QUESTIONS ABOUT ANY OTHER ASPECT OF THE COURSE, PLEASE DON'T HESITATE TO ASK YOUR PERSONAL TUTOR OR ONE OF YOUR MODULE TUTORS.

AIMS AND OBJECTIVES

AIMS

(1) To promote a reflexive understanding of scientific theory and practice with a view to producing numerate and scientifically literate graduates.

(2) To develop the capacity of students to understand how an issue may require scientific and social and cultural analysis, and the ways in which the relationship between these areas of questioning can be problematic.

(3) To produce graduates who can evaluate the ways scientific and cultural knowledge relate to social issues.

(4) To enable students to articulate the nature of scientific ideas both to the academic community and the wider public.

(5) To foster both a practical and a critical understanding of how science is represented and disseminated in contemporary society.

In short, we aim to produce students who, inter alia, are numerate, who have a reflexive understanding of scientific development and method, who can devise and undertake survey and project work, and can communicate effectively in written, audio, visual and oral form, about scientific ideas and ideas about science.

OBJECTIVES

(1) To acquaint students with the particular processes implicit and explicit in experimental and theoretical science and their interdependence; to enable students to apply the theories of science and to carry out and design simple experiments.

(2) To introduce students to questions about the ways in which science has been represented, both historically and currently. This would include the ways in which "Science" has at times become a privileged discourse, and the ways in which there has been a hierarchy within the sciences.

(3) To consider in depth certain areas where scientific developments have problematic relations with other cultural processes; for example, genetic engineering, information technology, environmental crises, so that students will become skilled at assessing the impact of mediations of scientific knowledge and development.

(4) To explain to students what mathematics is and what it can do. To reveal to them the conceptual structure of mathematics with the aid of graphical, historical and computational methods.

(5) To enable students to analyse the discursive and technical aspects of scientific reports and presentations and to make scientific ideas and their social implications usefully and accurately available to non-specialist audiences.

(6) To enable students to understand how science is presented, especially in the media and to enable them in turn to develop skills at representation.

(7) To open up to students issues pertaining to the public understanding of science and to ensure students demonstrate research skills appropriate to such issues, including survey work and the analysis and presentation of data.

PRINCIPLES

The major challenges that faced the development of this interdisciplinary degree were fourfold and centred around the problem of establishing an accessible degree for a diversity of entrants without sacrificing academic integrity.

1. The first challenge was to create an interdisciplinary course which unified traditionally disparate areas of study. The connections between the Humanities and the Sciences had to be vigorously emphasised whilst at the same time ensuring that the methodologies, knowledge base and concerns of individual disciplines were given due attention.

2. Recognising that the student intake will consist of both those having science and non-science "A" levels (as well as a proportion of non-standard entrants), the second challenge was to find a way of maintaining an equal level of interest and commitment from all students, while equitable academic demands were made regardless of previous qualifications.

3. Third, the challenge of defining student progression within the course had to be resolved. Given the innovative nature of this degree progression had thus to be conceived as a process which embodied the specific aims and objectives of this particular course whilst at the same time satisfying general University requirements.

4. Finally we had to evolve an assessment and course monitoring scheme which would guard against the students suffering from an excessive or uneven work load.

INTERDISCIPLINARITY

The degree course is interdisciplinary as opposed to multidisciplinary. Whilst the latter simply brings together disparate disciplines within a degree structure, interdisciplinarity as we define it posits a special and explicit relationship between different disciplines in at least two respects. First, the disciplines come together to focus their attention on commonly agreed areas of study.

Second, in certain circumstances this common focus results in the emergence of a new cohesive approach embracing

1. This form of interdisciplinarity is manifest principally in what we conceive of as the "interdisciplinary spine" of the degree, namely the Double Modules entitled "Development of Science in its Cultural Context". These Double Modules run in Years One, Two and Three thereby constituting a third of all modules.

   Years One and Two also include modules which contain significant interdisciplinary elements, e.g. "Investigating the Science in Contemporary Issues" (Year One) and "Scientific Analysis of Environmental Issues"" (Year Two) and "Science Journalism" (Year Two). "Science Journalism" will draw some of its material from the topics raised in the "Issues" Modules (Years One and Two).

2. Another form of interdisciplinarity occurs in the "Matter, Life and Physical Processes" modules in Years one and two. There the traditional barriers

between physics, chemistry and biology are deliberately blurred and a new organisation of scientific material is presented. This is an approach successfully pioneered by the Open University and one which we feel may ultimately prove attractive to students taking more Specialist Science programme as well as to our own students.

3. "Computing, Numerical and Graphical Methods" (Year I) exhibits inter-disciplinarity in that all the examples developed will be drawn from a wide variety of subject areas, (e.g. statistic methods for Social Sciences, the modelling of living systems, graphical representations of physical processes).

THE SCIENCE-HUMANITIES BALANCE

Our particular way of reconstructing and presenting science will be a novel experience for students with science and arts backgrounds alike. It is anticipated that this will have a levelling effect on the two types of students, thus minimising the dangers of discriminating against either group. It is hoped that any initial differences will be levelled out as the students' outlook is progressively influenced by the unifying perspectives adopted by the course as a whole.

However, it is recognised that some disparity will exist in the early stages of the course between students with the Humanities and Science backgrounds. This is addressed by the arrangement of the modules in the first year whereby a balance is attempted between science and non-science subjects. Thus two modules "Matter, Physical and Life Processes" (MPLP) and "Communicating Science" are distinctly located in Science and Humanities. Development of Science in a Cultural Context is equally balanced between Science and the Humanities. The "Computing, Numerical and Graphical Methods" (CNGM) module is "neutral" insofar as all students will have GCSE (grade C) or "A" level maths. The final module to be considered, "Investigating the Science in Contemporary Issues" falls into the Science rather than the Humanities camp but attempts to present Science in a most accessible way to students from both a scientific and a non-scientific background alike, i.e. through contemporary case studies.

To achieve the desired integration and consistency of experience some degree of student choice has had to be sacrificed. However once students acquire confidence in the approaches (in years one and two) they will have the opportunity to choose two out of the six modules in year 3 from a good range of Humanities Area and Science options.

In Years Two and Three, the balance between Science and Humanities Area subjects is even more strictly maintained.

PROGRESSION

The principle of progression is incorporated into the degree in such a way as to take account of the respective needs of the Science and Humanities subject areas in accordance with the conditions of a modular degree.

1. On the Science side, there exists a natural built-in progressinn arising out of increasing complexity. This is handled differently by the "Issues" Modules (Years I and II) and the "Development of Science in a Cultural Context" Modules (Years I, II, III) In the "Issues" modules, topics have been carefully selected to be in step with the developments in the supporting "Matter, Physical and Life Processes" modules. Thus issues treated at the opening stages of the course will require a less demanding level of scientific understanding than those which follow. The "Development of Science in a Cultural Context", on the other hand, adopts a historical approach to the fundamental elements of science. Starting with the more speculative Greek science, students progress onto examining the advanced (and less immediately accessible) theories of modern science in their final year. The role of the "Matter, Physical and Life Processes" modules is to ensure that the students' scientific knowledge base is adequate to the demands of the course as a whole. By year three, students should be equipped to deal with a Special Science option which is roughly equivalent to a second year course on existing Science degrees (BSc). This option will offer students the chance to pursue an in-depth study of a specialist topic which will complement his/her experience of Science.

2. On the Humanities side, the students are introduced to a Cultural Studies approach in Year One by way of the "Communicating Science" module and this underpins the Humanities elements in the "Development of Science in a Cultural Context" year One module.

   In Year two, "The Reception of Science" and the "Science Journalism" builds upon the knowledge, methods and skills established in the "Communicating Science" module and are again complemented by Humanities elements in the "Scientific Analysis of Environmental Issues" and the "Development of Science in a Cultural Context" Modules. By Year Three, the solid grounding students have received in the methods and approaches of Humanities type courses will equip them to undertake a further Humanities option.

3. The computing and numerical skills introduced in Year One will be used and further developed in the Core Modules in Years One and Two. For example, statistical survey methods will form an important element in the second year "Reception of Science" module, and mathematical skills developed in Year One will enable students to understand elements in both first and second year "Matter, Physical and Life Processes" and "Development of Science in a Cultural Context" Modules.

4. The "Independent Project" in Year Three provides students with the opportunity for extended independent research in an approved topic of their choice. This normally inter-disciplinary project which comprises a full third of the students' final year, builds on the research and project work introduced in Years One and Two and will provide the arena in which the students, analytical skills and subject expertise can be fully developed and demonstrated.

THE COURSE STRUCTURE: AN OVERVIEW.

1. The basic unit is the Module. Teaching time for a module is normally three hours a week. This time will he divided, as appropriate between lectures, seminars, workshops, laboratory sessions, tutorials or fieldwork, depending upon the needs of different disciplines.

2. Modules available to students in Part I of the degree will be at an academic standard appropriate to the first year of an Honours degree course. These courses will be called LEVEL ONE MODULES. Modules available to students in Part II of the degree will be at a more advanced standard and will be called LEVEL TWO MODULES. The Independent Project at

LEVEL THREE is equivalent to one third of a student year, and is available in the final year of study only.

3. Students take six modules or their equivalent each year.

ASSESSMENT

RATIONALE

1. In accordance with our stated aims, we wish to cultivate a broad range of skills and abilities and understanding in students undertaking this degree. It is precisely because of this that we require a broad range of assessment methods. The assessment system must:

   i) Conform to University regulations.

   ii) Take into account the interdisciplinary thrust of the degree.

   iii) Allow for the fact that our first year entrants will come from widely diverse academic backgrounds.

   iv) be designed to ensure that progression is fairly monitored and reflected in the final degree result.

2. Over the three years, each module (with the exception of the final year "Independent Project") requires a mixture of assessment methods. In the final year, students must do an extended piece of independent research under supervision (the "Independent Project") which counts as a double module in the assessment scheme.

3. We have divided assessed work into two broad categories: FORMATIVE and SUMMATIVE. The *formative* category denotes the work a student normally does before the end of the third term of each year as s/he is coming to grips with the course material. Since this work is submitted before May of each year students can expect to receive feedback on it. *Summative* work is normally required after mid-May of each year when the student is expected to have mastered the course material.

   a. Most formative work comprises what has been conventionally classed as coursework—essays, laboratory reports, and the like, but also includes short unseen tests in term time as well as projects and conference presentations in the first two terms of a year.

   b. Summative work includes, final unseen examinations, but also includes those extended essays, year conference presentations and short project work due in at the end of year as well as open book examinations.

   c. It is clear that as conceptually useful as these two categories are for assessment purposes, they are not hermetically sealed off from one another but in fact form part of a continuum of assessable work.

3.1 The *Weighting* between *formative* and *summative* work is normally 50/50 in all three years.

3.2 The weighting and variety of assessment methods used also reflects our belief that whilst the unseen examination is an important component in the assessment of learning, it should not unduly dominate the assessment system, particularly where exegetical, methodological or discursive skills are being judged.

4. First year marks are not carried forward into the calculation of final degree results because the first year is a time of adjustment, particularly for students who come from such diverse academic backgrounds.

5. The final degree component is thus based on an aggregation of the best 11 of the 12 module marks obtained by a student in Years II and III.

   a. This discounting of the worst module has its greatest impact on those students with a good average overall but who have performed poorly in a single module.

   b. This scheme explicitly recognises the wide range of skills and knowledge required on this course and encourages students to be adventurous in their choice of their third year options.

6. The award of the degree normally depends on the successful completion of the independent project.

METHODS OF ASSESSMENT AND ASSESSMENT EQUIVALENCIES

Each method of formative and summative assessment is assigned a specific weighting so that it constitutes a given proportion of a single module. This has entailed establishing a system of equivalencies between different assessment methods which can be adjusted by the Award Management Committee in consultation with the Examining Board if the need arises.

The methods of assessment and their weightings are listed below:

FORMATIVE WORK:

10%:Field Trip Report
Short Practical exercise
Short problem solving exercise

15%:One hour unseen term test

20%:Short Essay (approximately 1000 words)
Book/article review (approx. 1000 words)
Textual analysis (approx. 1000 words)
Laboratory/Practical Report
Data Interpretation Exercise
Problem Solving Exercise
Computer based Exercise
Oral Presentation Role Play (term time)
Short Conference presentation (term time)

25%:Conference presentation (term time)

30%:Standard Essay (approximately 2000 words)
Extended Laboratory/ Practical Report

50%:Project (normally 3,000-4,000 words) due in Term 2

SUMMATIVE WORK:

20%:Short Conference Presentation (end of term)

30%:Two Hour Open Book Examination (term 3)

40%:Three Hour Open Book Examination (term 3)

50%:Extended Essay (approximately 3,000-4,000 words due in term 3)
Group Audio Visual Project
Group Project (involving surveys or other types of research activity)

3 Hour Unseen Final Examination
Short Project
Conference Presentation (Term 3)

ASSESSMENT STRUCTURE

SUMMARY OF ASSESSMENT REQUIREMENTS:

1. This is a three year full-time degree with an honours component in the third year.

2. Students will be required to take:

   a. Year One: A total of six modules consisting of four single modules and one Double module.

   b. Year Two: A total of six modules, consisting of four single modules and one double module.

   c. Year Three: A total of one option in each of the Science and the Humanities/Social Sciences areas; two Double Modules, one of which is an Independent Project.

Students must sit the examination or meet the equivalent assessment requirements for these modules, submit the required coursework during the year and give evidence of conscientious performance throughout the year in each module or double module.

3. Year One results are diagnostic and will not contribute to final year degree results.

DEADLINES:

1. Assessable course work is required in all modules and this coursework must be completed in the year in which the modules are taken.

2. The general pattern of intermittent assessment, including the due date for the submission of each piece of coursework, will be coordinated by the Assessment Sub-Committee of the Award Management Committee and due dates will be clearly laid down in the Essential Papers which will be issued to all staff and students at the beginning of each academic year.

3. Separate arrangements for the submission of the Independent Project will also be undertaken by the Assessment Sub-Committee of the Award Management Committee in liaison with Project Coordinators. Dates for submission will be published in the Essential Papers circulated as above.

4. All assessable coursework must normally be submitted by the due date for each such element of assessment. Work which is submitted late shall normally be awarded zero marks or fail grades unless the student identifies extenuating circumstances which are accepted under procedures agreed by the Examining Board. Late work will be commented on by the tutor concerned and returned to the student for learning purposes.

5. Assignments with submission dates before mid-May shall be marked and returned to students.

6. All modules are finally assessed at the end of the year in which they are taken.

7. In the case of modules which are subject to intermittent assessment, assignments with submission dates before mid-May shall be marked and returned to students.

8. Any student may revise one piece of formative work in each module providing that assignment constitutes 30% or less of a module's assessment.

   a. The higher mark will replace the original mark.

   b. Students must normally submit an assignment by the due date in order to be eligible to revise work.

   c. A student wishing to revise an assignment should notify the module leader who will then liaise with the tutor who set the original assignment, so that a fresh piece of work can be set which is acceptable to both as an appropriate substitute.

   d. All such revised or substitute work will be set in term three on 5.5.95. The due date for such work is 19.5.95.

   e. The sole exception to this procedure is the case of the 3rd year Humanities area option, the Sociology of Science and Technology, where the formative element comprises one single project weighted at 50% of the module. Students failing this project will have the option of submitting a standard essay which will count for 30% of the module mark. This will be aggregated with the original fail mark which will have been down-weighted for this purpose to count for 20% of the module.

CREDIT RATING AND NOTIONAL STUDENT HOURS:

1. The University's Credit Accumulation and Transfer Scheme allocates 120 Credit Points per year of full-time study on three year undergraduate degrees. According to this calibration, a single module on the B.A. [illegible] will rate 20 credits, a double module 40 credits.

2. On this basis, one module on a course requiring 6 modules per year, will be equal to 180 hours of student study time.

3. Modules on the proposed degree will be allocated the credit rating and notional student hour rating as out-lined below:

YEAR ONE:

Computing, Numerical and Graphical Methods (Single Module)	20 Credits	180 hours
Investigating the Science in Contemporary issues (Single Module)	20 Credits	180 hours
Matter, Physical and Life Processes (Single Module)	20 Credits	180 hours
Communicating Science (Single Module)	20 Credit	180 hours
The Development of Science in A Cultural Context (Double Module)	40 Credit	360 hours
	120 Credits	1080 hrs

YEAR TWO:

The Cultural Analysis of Contemporary Scientific Issues (Single Module) 20 Credits 180 hours

Science Journalism (Single Module) 20 Credits 180 hours

Matter, Physical and Life Process II (Single Module) 20 Credits 180 hours

The Reception of Science (Single Module) 20 Credits 180 hours

The Development of Science in a Cultural Context (Double Module)40 Credits 360 hours

120 Credits 1080hours

YEAR THREE

Science Option (Single Module) 20 Credits 180hours

Humanities Area Option (Single Module) 20 Credits 180 hours

The Development of Science in a Cultural Context (Double Module)40 Credits 360 hours

Independent Project (Double Module)40 Credits 360 hours

120 Credits 1080 Hours

THE "INDEPENDENT PROJECT":

The "Independent Project" forms an essential and distinctive part of the course. The following rules govern its submission:

a. The "Independent Project" is defined as the study of an area of investigation specifically deriving from the Core Courses of the degree, i.e. those second and third level non-optional modules, approved by the Project Supervisor and the Award Management Committee.

b. The student must obtain approval of an "Independent Project" title from his/her Supervisor and register this title with the Project Coordinator by the end of the second year, specifically by 4 p.m. of the last Friday before examinations begin.

c. Independent Projects which cover more than one subject area will be approved, supervised and examined by Supervisors in both the relevant subject areas.

d. The specification of the student's proposed independent project must satisfy the Award Management Committee that the work proposed involves study at sufficient depth to reveal the qualities expected of a third year honours student: the ability to initiate a topic, to collect appropriate evidence independently, to exercise first hand critical judgement and to demonstrate an awareness of relevant methodological issues.

e. Approval of any proposals must be subject to the availability of suitable tutorial supervision.

f. Periodical reports on individual projects will be required of students during the final year, and these will be endorsed by supervisors as a record of progress, consultation and counselling.

g. Students will be required to make a formal progress report on their "Independent Project" to staff and students towards the end of the second term of their final year.

h. Informal seminars and tutorials will be held for students undertaking "Independent Projects" during the Autumn and Spring term of the third year. The staff will aim to provide 30 minutes per fortnight (or equivalent) for supervision of individual projects.

i. In exceptional circumstances, the Award Management Committee may approve a change of subject during the third year.

j. The required length of Independent Projects will normally be between 8,000-10,000 words.

k. All Independent Projects will be double marked internally and assessed by External examiners. Two External Examiners may be necessary in some cases.

REGULATIONS GOVERNING MARKING

1. In order to establish good practice and ensure marking standards are comparable, particularly in the interdisciplinary core modules, all the Formative and Summative Assessments for the modules will be double marked by members of the staff responsible for teaching and/or coordinating each particular module. Once good practice has been clearly established, to the satisfaction of External Examiners, the Examining Board may sanction a reduction of the double marking to an agreed sample.

2. For the first year, representative samples of examination scripts will be moderated by the External Examiners for the first two cohorts only.

3. In Years Two and Three, samples of summative assessment will be double marked by appropriate staff internally. All examination papers and representative samples of the scripts will be moderated by the External Examiners,

4. The "Independent Project" will be assessed by the project Supervisor, who will have a specialist interest in the area covered by the project, and a second marker. A mark will be awarded for the written project independently by each internal marker. Where the recommended marks differ by a maximum of 5% but are within the same class, agreement will be reached internally, if necessary, by referring the project to a third assessor. Where it proves impossible to reach agreement internally, or the difference is greater than 5% or straddles the class of mark, the project shall be referred to the External Examiner whose decision will be final. All "Independent Projects" will be moderated by external examiners.

a. During the third term of year three, the supervisor, the second marker and the appropriate external examiner may conduct jointly a viva voce examination (of about 20 minutes) of any student whose mark falls within 2% of a higher classification or where illness or other extenuating circumstances has, in the judgement of the Examining Board, prevented satisfactory completion of the Independent Project and where this may have a detrimental effect on the final degree classification.

REGULATION ON PROGRESSION

All modules are finally assessed at the end of the year in which they are taken.

a. In order to progress from one academic year to the next, the student must normally be deemed by the Examining Board to have passed all the modules in the preceding academic year.

b. In order to pass each year of the course the student must normally obtain an aggregate coursework and examination mark of at least 40% in each individual module.

c. Students must also show evidence of conscientious attendance and full participation in all modules.

COMPENSATION BETWEEN SUBJECTS (CONDONEMENT)

Year One: the Examining Board has the discretion in the case of one marginal fail (normally within 5% of the pass mark) to condone that failure, provided it is in a single module and the Board is satisfied that the condonation will not interfere with a student's ability to cope with second year modules.

Year Two: the Examining Board has the discretion to allow, in exceptional cases of marginal failure in a single module normally within 5% of the pass mark, students to proceed to year three. However the Board must be satisfied that the failure is of such a nature that it will not impede a student's ability to cope with third year work

Year Three: At the discretion of the Examining Board, a student who has failed one module may be compensated by reference to good overall performance. The Examining Board however reserves the right to exercise full discretion in all such cases.

REFERRAL

A student who has failed

a. one module, which the Examining Board has not compensated, shall be referred

b. two modules may be referred at the discretion of the Examining Board

c. more than three modules shall normally be failed. Exceptionally, the Examining Board may exercise discretion to offer referral in three modules.

d. The Examining Board shall decide the nature of the referral.

e. A student who has been referred shall be required to pass all referred modules in order to progress. Referred modules shall normally carry forward a pass mark of 40% into subsequent aggregations of marks.

f. A student who fails a referral shall fail the course. The Examining Board may permit the student to repeat the year or the full diet of assessments without attendance.

Illness in non-final years

If a student fails to satisfy the conditions for progression to the next stage of the course due to his or her proven illness or other cause found valid on production of acceptable evidence, the Examining Board may exercise discretion in a manner appropriate to the case. In such circumstances, the Examining Board may permit a student to take the assessment, for the first time, in September, or where this is not appropriate, the Board may deem the student to have passed, provided there is sufficient evidence to support this judgement. If there is insufficient evidence and a September assessment is inappropriate, the student shall be permitted to repeat the relevant module(s) with or without attendance.

AWARD OF QUALIFICATIONS

1. A student shall normally be required to obtain a minimum 40% pass mark in each of the 12 modules including the "Independent Project" in order to obtain an honours degree.

2. In the final year, compensation may be allowed in one Module only unless extenuating circumstances are accepted by the Examining Board to justify the waiving of this regulation.

3. Exceptionally, where a student has failed two modules, the Examining Board, having considered that student's overall range of marks in Years II and III, and any other factors it judges relevant, may exceptionally award a degree one class lower than the aggregate indicates. Where the aggregate indicates a 3rd class the Board may award a Pass Degree.

4. The system of arriving at recommendations for the award of the Honours Degree shall not be binding on the Examining Board, which shall have powers to vary the scheme in individual cases and to determine the award, including the award of the various classes of Honours, at its discretion, after taking into account all relevant aspects of the student's work throughout the degree course, and paying attention to the range of performance.

5. *The Method of Aggregating Marks for the Final Degree Classification:*

A student is normally required to obtain a pass mark of 40% in all the modules taken in Year II and III. Double Modules (including the "Independent Project") are each weighted at twice the value of single modules. However, the lowest mark obtained for a single module will be dropped from the calculation of the final degree. In the case where the lowest mark obtained is in a Double Module, that mark would count only as a single module in the final aggregation.

6. *Classification of the Degree*

The aggregation of marks as described in 5.5. will be classified according to the following criteria:

70% and above	First Class
60-69%	Upper Second Class
50-59%	Lower Second Class
40-49%	Third Class

PASS DEGREE

1. A Pass degree will normally be awarded to a student who fails his/her "Independent Project" but passes 10 out of the 12 modules in Years II and III, two of which must normally be the Independent Project.

2. The degree will not normally he awarded without the submission of a successful project except in exceptional circumstances at the discretion of the board.

ILLNESS AND AEGROTAT AWARD

If it is established to the satisfaction of the Examining Board that a student's absence, failure to submit work or poor performance in all or part of an assessment for an award was due to illness, or other cause for which acceptable evidence has been produced, the Board shall act in accordance with the relevant University Regulation.

PROVISION IN THE CASE OF FAILURE IN THE FINAL EXAMINATION

1. *Failure to qualify for an Honours Degree*

a. Where a student has failed to qualify for an Honours Degree s/he shall normally be recommended for the award of a Pass Degree provided a minimum of 10 modules taken in Years II an III have been passed.

b. Where a student has failed to qualify for an Honours Degree, the Board may, exceptionally, recommend the award of a Degree if in the view of the Board the candidate merits the award although not qualifying for it under the above regulation.

c. Where a student has failed to qualify for an Honours Degree and has not been recommended for the award of a Pass Degree, the student may be re-examined in any or all parts of the final examination for a Pass degree, or may be allowed to suhmit additional work to meet the assessment requirements for a Pass degree, within a period of a further two years, or within the maximum period of registration, at the discretion of the Board.

d. A candidate for Honours who has failed to satisfy the Board at the final examination shall not be permitted to resit for the degree with Honours, unless the Board, exceptionally, by exercising its discretion at the time of the initial failure, rules that the candidate may be re-examined with the possibility of a degree of Honours being recommended. Where the Board so permits a candidate to be re-examined for Honours, the candidate may retake the complete diet of examinations once more only, within a period of a further two years or within the unexpired maximum period of registration, whichever period is shorter. The complete diet of examinations must be taken in the same academic year. The Examining Board may permit successful formative assessments and "Independent Project" marks to be carried forward.

2. *Arrangement for Variant Modules*

In any case in which a student has failed the final examinations the student may take variant modules rather than repeat failed work, where this is agreed by the Examining Board to be in the student's best interest.

3. *Attendance at the University*

Where the Examining Board so decides, a student may be allowed to re-take examinations without further attendance at the University.

APPEALS

Application for review of decisions of examining Board.

An application for review of decisions of Examining Board may only be made in accordance with the relevant University Regulations.

EXAMINING BOARD

1. TERMS OF REFERENCE OF THE EXAMINING BOARD:

The Academic Board has regulated the existence, membership and Terms of Reference of Examining Boards. A summary is as follows:

a. The Examining Boards for Years I, II, and III respectively shall deal with all aspects of student examination (i.e. formative and summative assessment) on this degree course.

b. Composition of the Examining Board:

Year One

i. The Dean of the Faculty of Sciences or his/her nominee. (Chair)

ii. The Dean of the Faculty of Humanities or his/her nominee

iii. The Course Leader

iv. Staff Coordinators of all Year One Modules. (Normally nne from each single module and two from the double module)

v. The Course Advisors

vi. The Director of Studies for the Faculty of Sciences

Year Two

i. The Dean of the Faculty of Sciences or his/her nominee (Chair)

ii. The Dean of the Faculty of Humanities or his/her nominee

iii. The Course Leader

iv. Staff Coordinators of all Year Two Modules. (Normally one from each single module and two from the double module)

v. The Course Advisors

vi. The Director of Studies for the Faculty of Sciences

vii. The External Examiners (ex-officio)

Year Three

i. The Dean of the Faculty of Sciences or his/her nominee (Chair)

ii. The Dean of the Faculty of Humanities or his/her nominee

iii. The Course Leader

iv. Staff Coordinators of all Year Three Modules.

v. The "Independent Project" Coordinator

vi. The Science Options Coordinator

vii. The Humanities Area Options Coordinator

viii. The Course Advisors

ix. The Director of Studies for the Department of Science

x. The External Examiners (ex-officio)

The Examining Board shall have the power to invite other persons to attend any meetings of the Board, to advise it.

A ratifier who does not teach on this course may be required to attend the meetings of the Examining Board which are concerned with students' progress or awards, as an observer to ratify decisions on behalf of the Faculty Board of Studies.

A representative of the Academic Registrar shall act as secretary of the Examining Board.

SPECIFIC TERMS OF REFERENCE OF THE EXAMINING BOARD

1. There shall be an Examining Board concerned with each stage of assessment on the course.

2. Internal Examining Board

The Board may meet as an Internal Examining Board in the absence of External Examiners, in order to make day-to-day arrangements for the administration of the scheme of assessment: such meetings will not be concerned with recommendations leading to the award of the degree.

The quorum for a meeting of the Examining Board shall be two thirds of the members eligible to attend. At meetings where results or student progress is to be decided, at least one External Examiner must be present where one to three External Examiners have been appointed for that particular stage of assessment; two must be present where four or more have been appointed.

3. The Examining Board may delegate its responsibilities for deferred, referred or resit candidates to a committee, provided that the committee is set up at the time of the initial consideration of the candidates concerned, and provided that the Board at the same time determines the parameters for the committee's decisions on individual candidates.

4. The terms of reference of the Examining Board include the following duties:

i. to approve procedures for the nomination of External Examiners for consideration by the relevant Faculty Board of Studies;

ii. to ensure that draft examination question papers are properly scrutinised and approved;

iii. to ensure that examination scripts, projects and assignments which affect candidates' progress on the course or contribute to the final assessment are properly scrutinised and marked;

iv. to ensure that appropriate, viva voce examinations are properly conducted;

v. to determined whether a candidate has complied with the requirements of the course and its assessment and may proceed to the following stage of the course, and/or to make recommendations for the award of the appropriate qualification;

vi. to determine what action shall be taken, in accordance with the course regulations, in the case of a candidate failing or missing part or all of the assessment or failing to comply with the requirements of the course and its assessment;

vii. to determine, in accordance with University regulations, what action shall be taken in the case of a candidate found to have committed an assessment offence;

viii. to make recommendations to the Award Management Committee on any matters concerned with the assessment scheme for the course;

ix. to be responsible for such other matters as required by the course regulations or which are referred to the Examining Board by the Academic Board or the Faculty Board of Studies.

2. EXTERNAL EXAMINERS

Duties of External Examiners

Every External examiner shall be adequately briefed about all aspects of the course. His/her duties shall be made clear to him/her on appointment. In order to carry out these duties, the external examiner(s) must:

a. be able to judge each student impartially on the basis of the work submitted for assessment, without being influenced by previous association with the course, the staff, or any of the student;

b. be able to compare the performance of students with that of their peers on comparable courses of higher education elsewhere;

c. approve the form and content of proposed examination papers, coursework and other assessments that count towards the award, in order to ensure that all students will be assessed fairly in relation to the course syllabus and regulations and in such a way that external examiners will be able to judge whether they have fulfilled the objectives of the programme and reached the required standard;

d. be consulted about and agree to any proposed changes to the approved assessment regulations which will affect students currently on course;

e. attend examiners' meetings and have access to all assessed work,

f. see the work of all students proposed for the highest available category of the award and for failure, and samples of the work of students proposed for each category of award, in order to ensure that each student is fairly placed in relation to the rest of the cohort;

g. have the right to moderate the marks awarded by internal examiners;

h. have the right to conduct a viva voce examination of any candidate;

i. ensure that the assessments are conducted in accordance with the approved programme regulations;

j. attend the meeting of the Board of Examiners at which decisions on recommendations for award are made and ensure that those recommendations have been reached by means according with the University's requirements and normal practice in higher education;

k. participate as required in any reviews of decisions about individual students' awards taken during the examiner's period of office;

l. report back to the institution on the effectiveness of the assessments and any lessons to be drawn from them;

m. report to the Council through the Chairman of the Academic board of the institution on any matters of serinus concern arising from the assessments, which put at risk the standard of the Council's award.

AWARD MANAGEMENT COMMITTEE:
COMPOSITION AND TERMS OF REFERENCE

COMPOSITION:

1. *ex-officio members:*

The Course Leader who is appointed by the Dean of Science in consultation with the Dean of Humanities

The Dean of the Faculty of Sciences

The Dean of the Faculty of Humanities

Deputy course leader

All Module Leaders

The Science Options Coordinator

The Humanities Options Coordinator

The Independent Project Coordinator

Three Course Advisors

The Admissions Tutor

Two Representatives from the Library Staff (one from each site)

Two Student Representatives from each year

2. *Co-opted members*

The Award Management Committee reserves the right to invite to its meetings people including, inter alia, internal support staff and external representatives as non-members as it deems appropriate.

3. The Award Management Committee shall normally be chaired by the Course Leader.

4. The quorum for meetings of the Award Management Committee shall be one third of the members eligible to attend.

OFFICERS OF THE AWARD MANAGEMENT COMMITTEE:

The Course Leader has general responsibility for the overall organisation, development and co-ordination of the degree course and will be Chairperson of the Award Management Committee. S/he will also be responsible for the preparations of agendas and for the implementation of decisions of that Committee. In conjunction with the Chairperson of the Examining board, the Course Leader will be responsible for the preparation of the Course Handbook and Essential Papers.

The Independent Project Coordinator will be selected by the Award Management Committee to oversee and coordinate the allocation of project supervisors to students, to monitor student progress, and generally to ensure that Independent Projects are properly administered.

The Director of Studies for the BA will be responsible to the AMC for the administrative liaison among the coordinators of the taught modules and the "Independent Project" module area boards contributing to the degree scheme, the allocation of rooms, the construction of the timetable, the compilation of degree entries and the organisation of the graduation ceremony. In addition, the Director of Studies will have responsibility for student records, option choices, withdrawals, direct entry transfers, and advising the Registry in dealings with local education authorities.

Course Advisers will be responsible to the Course Leader for all student counselling on the degree. The Course Advisers will be responsible for securing clarification of student option choices sufficiently early to permit efficient course planning and to share with Personal Tutors responsibility for students references and testimonials and student attendance on the course. They will also be responsible for running the Induction programme for First Year students.

Admission Tutor will be responsible to the Award Management Committee for the implementation of admissions policy and arrangements for selection interviews, and all matters relating to admission of students, including publicity and contact with schools and colleges.

The Examinations Officer (from the Department of Science) will be responsible through the Chairperson of the Examining Board for all matters relating to the preparation and conduct of examinations.

TERMS OF REFERENCE OF THE AWARD MANAGEMENT COMMITTEE

The Terms of Reference will be in accordance with University requirement as specified in the *Academic Standards Handbook*. It will be noted that the Award Management Committee is a large Committee. We feel the composition is acceptable given its terms of reference, for two reasons.

1. In the early stages of the Degree's operation, the Programme Management Committee will have a Staff Development Function in that two very different Departments will need to establish good and mutually acceptable practice. A Committee so constituted will most quickly engage a large proportion of staff from both departments into this

new modus operandi. As the Course proceeds, the composition of the Award Management Committee could then be streamlined.

2. A significant proportion of the work of the Award Management Committee will be delegated to its officers and to Sub-Committees formed as necessary to assist the Award Management Committee in some of its functions. In particular, the Project Coordination Sub-Committee and the Assessment sub-committee will be established thus making the size of the Award Management Committee itself a less important consideration.

3. *The Assessment Sub-Committee:*

The Course Planning Team has envisaged particularly pro-active role for the Course
Management Committee team with regard to assessment. More specifically, there will be an Assessment Sub-Committee of the AMC whose brief it will be to:

a. coordinate the assessment schedule;

b. to monitor student and staff response to the range and amount of assessed work demanded;

c. to ensure that appropriate systems for double-marking are in operation.

d. to liaise with the Examinations Officer of the Examinations Board on matters of mutual concern relating to the preparation and administration of summative as well as formative assessable work.

e. concern itself with the Degree's assessment policy rather than with the assessment of individual students which is the concern of the Examining Board.

4. The Course Leader will take responsibility for publicising the assessment schedule and general assessment requirements as devised by the Assessment Sub-Committee and approved by the Award Management Committee.

5. The Independent Project Sub-Committee:

The Independent Project Sub-Committee will be chaired by the Independent Project Coordinator and will assist the Coordinator in the administration of the Independent Project.

GUIDANCE AND COUNSELLING

A modular system, by its nature, entails a large role for counselling and tutoring, both academic and non-academic. Guidance and Counselling is provided for within the degree in the following ways:

1. The Course Advisors will offer advice on study skills and academic problems and where appropriate personal difficulties.

2. The Course Advisors will also be responsible for ensuring that the system of Personal Tutors as outlined below works effectively.

3. Personal Tutors also have an important role to play. Each student will be assigned a personal tutor from the teaching staff on the degree by the Course Advisors.

The Personal Tutor will be responsible for supplying references, and testimonials for the student as well as advising student informally on academic and personal matters.

MONITORING AND EVALUATION

A system for the Monitoring and Evaluation of the degree, in accordance with University Requirements, will include the following feature:

Procedures For Obtaining Student Feedback:

1. The students will be clearly and specifically informed at the beginning of the year of the aims and content of each module in that year and how they are related to the aims of the course as a whole. This will be the responsibility of subject lecturers.

2. In term three of each year, students will be asked to complete a questionnaire which will probe their reactions to the course. The questionnaire will allow for extended comments by the student and will not be restricted to short multiple choice-type questions. The Course Advisors in association of the Module Coordinators will have responsibility for administering the questionnaires.

3. The Award Management Committee will involve its student representatives in helping to ensure adequate student feed-back about the day to day running of the degree.

Procedures For Obtaining Staff Feedback:

1. It is envisaged that the Award Management Committee structure based as it is on an infrastructure of accountable module area boards will ensure adequate feed-back from the academic staff.

2. The submission of an annual Course Report first to the degree's Award Management Committee and then to a panel representing the Faculty Monitoring and Evaluation Committee will ensure that the course is suitably evaluated by an independent body.

3. The production of the annual Course Report will be the responsibility of the Course Leader.

Part II

IN THE FOLLOWING PAGES,YOU WILL FIND A BRIEF ACCOUNT OF THE FIRST, SECOND AND THIRD YEAR MODULES.

FOR EACH OF THESE YOU WILL OF COURSE RECEIVE MUCH FULLER DOCUMENTATION WHEN YOU BEGIN TO STUDY THEM.

WE HAVE INCLUDED THIS SO THAT YOU CAN GET A SENSE OF THE YEARS AS A WHOLE.

DEVELOPMENT OF SCIENCE IN A CULTURAL CONTEXT

OVERVIEW OF THE COURSE OVER THREE YEARS

First, Second and Third Years
Double Modules
Core Modules

1. This constitutes the main core of the degree and consists of one double module in each of the three years. It aims to combine three elements and to encourage students to explore the relations between them. First, it is a carefully planned presentation of science, studied in terms of certain 'seminal milestones'. Second, students are encouraged to ask in what ways these milestones were 'seminal', how, and in the face of what alternatives in the history of science, certain approaches and understandings came to be accepted as more valid and useful. Finally, to open students' ways of thinking about how scientific theorising and experimentation are embedded in social and cultural contexts.

2. Within the "Development of Science in a Cultural Context" strand there are two tracks.

   a. The Science Track which follows the historical development of science in terms of a sequence of these milestones, covering the disciplines of physics, chemistry and biology.

   b. The Cultural Track uses the opportunities of the historical sequence, to introduce questions about the nature of scientific knowledge, and how science is implicated in political and social thinking. The general aim will be to encourage exploration of forms of scientific knowledge and how it relates to historical, political and social contexts. The track will draw on and connect with students' own experience and commonsense knowledge of the impact of science on their own lives.

   Therefore the Cultural Track will only loosely follow the historical periodisation but will use this periodisation to draw attention to a set of conceptual issues which will develop over three years.

   In each year the Cultural Track will be forged round some key questions, which can act as hinges between the historical periods being explored, and our own time.

3. The two tracks are taught relatively independently. But in both, certain questions are regularly put on the agenda, focused around the issue 'what made certain scientific ideas seminal?'. In this way issues out of the history of science are raised and explored with students. Then the tracks are brought together at termly intervals in jointly taught 'conference' sessions. In these sessions, staff and students together will be exploring the particular connection that have emerged from the content of each of the tracks. We have characterised these issues where students will be linking the two tracks, as 'handshake issues'.

4. In the first year of these modules especially, it is not expected that students will be able to make strong and supported connections between these elements. Therefore at first the emphasis will be on ensuring that they are secure within the science elements, but that they also begin to ask appropriate (probably fairly unrooted) questions about science in history and culture. The extent to which they can be expected to synthesise materials and ideas across the two tracks will clearly increase over the three years of the "Development of Science in a Cultural Context", and the degree of integration across the two tracks will thus be able to increase.

5. The "Development of Science in a Cultural Context" is supported by the materials, ideas and skills being introduced in other modules in the first and second years, most particularly the "Matter, Physical and Life Processes" and "Computing, Numerical and Graphical Methods" modules.

6. *Conferences*

   'Conferences' play a key role in the teaching and assessment of the double module "Development of Science in a Cultural Context". They provide the necessary link that binds together the two tracks of science and culture. Although the two tracks will be designed to run in tandem. The conferences are a more formal way of making explicit the relationship between the two.

DSCC :First Year

Aims

The theme informing the aims of The Cultural Track is *The Scientific Revolution.*

*I*n the first year the track will examine the transformation of 'classical' natural philosophy into what may be seen as the origins of 'modern' science. By tracing the growth of Renaissance science through the three traditions of organicism, magic and mechanism it will seek to place the development of natural philosophy within its varied social, political and cultural contexts. In so doing it will explore the historical foundations for the basic tenets of science such as law, observation, and experimental method.

The Science Track will seek to develop, alongside the cultural exposition, the basic notions and concepts which underlie the foundations of science. This course will elaborate the seminal ideas and theories which formed the backbone of physical and biological science from the ancient Greeks to Newton. The justification for such a reduction of Science will emerge from the cultural context.

The 'handshake' areas will be consolidated in two conference sessions. See Calendar.

Module co-ordinators

(Humanities track)
(Science track)

DSCC :Second Year

The Cultural Track's analysis will concentrate on the Industrial age and the rise of modern science. In one sense track will pick up the threads from the first year to continue the story through to the early years of the twentieth century. More importantly, the central focus of the track will be the development of science in the emerging industrial society of the eighteenth and nineteenth centuries and the role that science played in both fostering social change and maintaining social order both in the West and in the non-industrial world.

The Science Track will focus on the notion that post-Newtonian physics consisted of an evolution of the dynamical scheme which subsequently became the dominant paradigm of science. It will also examine, in parallel, those developments in biology and chemistry which started in the early eighteenth century and culminated in the mature theories of the nineteenth century. The interplay between the seminal ideas of the different scientific movements will be emphasised.

The Handshake issues will be explored in two conference sessions.

Content for the Cultural Track

Term one: Exploration and empire.
The Enlightenment; history of science in the 18th century; literature and science; the politics of the Enlightenment; the idea of progress; the impact of industrial revolution on human life; the rise of religious individualism; the impact of the French revolution on notions of class, race and gender equality; evangelical religion and the seeds of modern conservatism and liberalism.

Terms two and three:
Romantic reactions against industrialism; science and social control, the impact of Darwin on literature, religion and social policy; science, state and the rise of the expert, nineteenth century science, gender, medicine and psychoanalysis; literary images of science; science and the popular press, Marxism and materialism.

Content for the Science Track

Term One:
Electrostatics; charge, Coulomb's law. Organisation of cells of tissue. Comparative botany, anatomy and embryology.
Recognition of materials and pufication. Respiration: cellular metabolism.

Term Two:
Fields; electric and magnetic, waves, interference and diffraction. Lamarck's adaptive evolution and the Darwinian theory of natural selection. Temperature, heat, work done and energy. Thermodynamic systems.

Terms two and three:
Romantic reactions against industrialism; science and social control, the impact of Darwin on literature, religion and social policy; science, state and the rise of the expert, nineteenth century science, gender, medicine and psychoanalysis; literary images of science; science and the popular press, Marxism and materialism.

Module co-ordinators

one for science track, one for humanities track.

DSCC :Third Year

Aims

The Cultural Track will raise the issue of: Science and the modern world. The third year will pay particular attention to the involvement of science in everyday life and the increasing questioning of the role of science in the light of local and global crises.

The Science Track will aim to give the student an overview of the current scientific landscape with the view to offering an insight into the ideas and methods on which the contemporary programmes of science are based. It will also attempt to show how modern theories are debated and evaluated by participating scientists. In addition, it will establish some ecological notions as fundamental advances in their own right.

The conferences will recognise the maturity of the students by becoming more extensive in their scope. The final one will be a major event involving outside speakers and builds up to the final exam. For more information, see overview .

Content for the Cultural Track

Key areas for examination will be:

1. The new scientific revolution; the relativising of perception and knowledge; the loss of linear models; the implications of advances in medical and genetic sciences.

2. The information revolution; 'deskilling' and the future of work; control of information and control of society; redrawing the public/private distinction.

3. Visions of tomorrow; representations of science futures in various cultural forms.

4. Science in the everyday; technology in the home; vernacular science and democratic epistemologies; pseudoscience, non-science, and anti-science.

5. Fears and apprehensions; scientific dystopias and the threat of technical domination.

6. The new 'mysticism' in science; the Tao of physics; Gaia, Greens, and ecology; the search for alternatives.

Content for the Science Track

Term one:
Homeostasis; maintenance of the internal environment. Elements of relativity theory. Elements of quantum theory. Elucidating the atomic structure, X-rays. Characterisation of macromolecules as a new chemical level.

Term two:
Mechanisms of heredity; role of nucleus and cell cycles. Practical developments that followed from quantum theory 1: nuclear power, electron microscopes. Application of spectroscopy to chemical problems.

Term three:
Practical developments that followed from quantum theory 2; lasers, transistors and other devices. Concepts of interdependent organisms, communities and systems

Module co-ordinators

one for science track, one for humanities track

MATTER, PHYSICAL AND LIFE PROCESSES

First Year
Single Module
Core Module

Aims

This module, is a prerequisite to the "Matter, Physical and Life Processes" module in Year II and provides an appropriate foundation in the physical and life sciences which will:

1) underpin, extend and illuminate the science components of the "Issues" and "Development of Science in a Cultural Context" modules and

2) provide the necessary foundation for the "Matter, Physical and Life Sciences" module in Year two.

Content

Observation and measurements: mass, length and time; interpretation of experimental data. Statistics: normal distribution, mean, standard deviations; chance events and probability.

The structure of matter: atoms, elements isotopes, molecules and compounds; the electronic structure of atoms; spectra, energy levels.

States of matter: phase changes in energy; gases, liquids, solids; entropy.

The Electromagnetic spectrum: wavelength; frequency, interactions. The nature of living things: a consideration of;

a) Structure, form and function: viruses, prokaryotes and eukaryotes; taxonomy.

b) Nutrition: plants and animals.

c) Sensibility: primitive sense organs and the mammalian eye.

Basic cell biology: organisation of the cell; role of nucleus and chromosomes in cell division; cell cycles.

Introduction to ecology: interdependence of communities and land forms in hydrological, carbon and nitrogen cycles. Disease processes: the concept of homeostasis and disease mechanisms.

Forms of energy and their interconversion; units of energy, forces, fields, power.

Module Co-ordinator

Science lecturer

MPLP

Second year
Single Module
Core Module

Aims

To build upon the first year MPLP and to:

1) underpin and illuminate the science components of the other years two modules

2) provide a basis for further progress and specialisation in the final year of the course.

Content

The shape, internal structure and composition of the Earth; major features of the earth's surface: plate tectonics, sea floor spreading; continental drift; the principle of uniformitarianism.

Electricity and magnetism.

The periodic table and chemical bonding; acids, bases, salts, ph and buffers. Chemical reactions, making and breaking bonds.

Covalent compounds, organic compounds and the influence of structure on properties.

Co-ordination of metabolism; diseaseprocesses, phylogeny and ontogeny; development of evolutionary theories.

Inductive and deductive processes in scientific research. Term Three: Molecular structure and the Periodic Table. Microbiology. Electromagnetism, spectroscopy and atomic theory.

Module Co-ordinator

Science lecturer

INVESTIGATING THE SCIENCE IN CONTEMPORARY ISSUES

First Year
Single Module
Core Module

Aims

An "issue" is defined as a topic which has given rise to debate or controversy within sectors of the public.

1) To make the student cognisant with the science underlying various contemporary issues.

2) To investigate the types of scientific observations, measurement methods, and the uncertainties which limit the precision of conclusions and predictions.

3) To enable the student to understand what the received/accepted views on such issues are.

4) To enable the student to understand and experience the difficulties in the communication of science.

5) To enable the student to appreciate that contemporary issues have implications beyond those posed purely by the science involved.

6) To enable the student to develop critical and evaluation skills with regard to scientific issues, contemporary and in the future, which are presented in the media.

No member of the Course Team will expect any particular outcome in the students perception of an issue. A main thrust of the module will be to develop the students' evaluation and assessment skills with respect to the nature, reliability and the role of scientific evidence and their ability to communicate their findings. However no science based issue exists in isolation. Hence the appraisal of the wider implications will form an integral part of the module.

Content

Four or five scientific issues which are not widely recognised as environmental in nature will be examined in this module, each issue extending over an average of 5 of 6 weeks. The topics chosen will be selected on the following criteria :

1) There is a strong scientific basis to the issue

2) The science involved is at an appropriate level for thecourse

3) There is an element of scientific controversy within the topic

4) There are wider implications involved

Issues dealt with will change depending upon various circumstances but will, it is hoped, link in with the presentation of material in other modules, in particular "Matter, Physical and Life Processes" I.

Issues may include :

1 The Vegetarian Diet
2 Food Preservation and Safety
3 Cancer, Origins and Treatments
4 Information, control and the Computer
5 Electric Power Transmission
6 Big Science

Module Co-ordinator

Seneca Lectures

COMPUTING NUMERICAL AND GRAPHICAL METHODS

First Year
Single Module
Core Module

Aims

This course has a dual aim. It is to bring students to a certain level of mathematical competence while at the same time to provide them with a working knowledge of computing. Its objectives are to support other areas of the first year course and to develop a quantitative approach to problems.

The programme naturally divides into four sub-aims which are interdependent and complementary. These are:

1) To provide an overview of the general scheme of computers and computing and to introduce the different functions and utilities of a microcomputer.

2) To review and develop some fundamental elements of geometry and algebra.

3) To explain and develop, with the aid of computing, the use of equations and functional relations between quantities and variables encountered elsewhere on the course.

4) Finally, to use spreadsheets for the exploration and representation of numerical and graphical calculations.

Content

Computing: mainframes and PCs; operating system; directories; files and their handling. Wordprocessing, desk top publishing; spreadsheets, data handling and interfacing.

Numerical methods: rational and irrational numbers; binary numbers, floating point arithmetic. Expressions and their numerical evaluation on computer. Functions and equations (linear, quadratic, trigonometric and exponential).

Graphical methods: elementary geometry; conic sections; coordinate systems; linear and non linear graphs.

Introduction to calculus: single and double rates of change; slopes and tangents; differentiation and integration from the computational point of view.

Module Co-ordinators

2 Seneca Lecturers

COMMUNICATING SCIENCE

First Year
Single Module
Core Module

Aims

1. To introduce students to the approaches, concepts and research relevant to considering how scientific knowledge and developments are communicated to non-scientists;

2. To examine a range of kinds of materials which embody such communication, and to develop in the students skills of analysis of such materials;

3. To consider the ways in which popular conceptions of 'nature' and 'science' are interwoven with conceptions of power, hierarchy and gender;

4. To lay a foundation of skills so that the students are able themselves both to design and practice such communications and to critically evaluate their own attempts.

Content

There is a growing body of research, drawing on several traditions of enquiry, into the ways in which scientific ideas are communicated to non-scientists, most notably relating to Television's presentation of science in news and documentaries, but also considering the presentation of science in popular forms of culture. In order to understand this research students will need to be introduced to several conceptual debates, notably about the idea of 'discourse' (especially in relation to the mass media), theories of media/audience relationship, and concepts of news and documentary (bias/selection/construction).

Also, there has been a rising interest in the ways in which conceptions of the natural world as an object of study themselves bear the marks of our culture: from the ways 'nature' is conceptualised in scientific enquiry, to the ways in which practices towards non-human species reflect historical and cultural attitudes towards the natural world.

Introductions to these will be linked with learning how to make close analyses and deconstructions of televisual presentations of science; and hence to the practical design and making of small audiovisual presentations of, for example, a TV science news item. For this purpose students will be involved in practising interview techniques, camera and front-of-camera presentation skills, scripting, storyboarding, production of graphics, and editing.

Module Co-ordinator

Nils Lindahl Elliot

THE SCIENTIFIC ANALYSIS OF ENVIRONMENTAL ISSUES

Second Year
Single Module
Core Module

Aims

The aims of this module are broadly similar to those of the Level One 'Investigating Science in Contemporary Issues' module, but are particularly focused upon the correct scientific understanding of environmental issues in order to:

1) make the student cognisant of the science underlying selected environmental issues;

2) investigate the kind of methods, their precision and uncertainties which limit the predictions that can be made with regard to environmental issues;

3) enable the student to understand what the received/accepted ideas on such issues are;

4) enable the student to understand and experience the difficulties in the communication of science in relation to the environmental issues;

5) enable the student to appreciate that contemporary issues have implications beyond those posed purely by the science involved;

6) enable the student to develop critical skills which will enable him/her to evaluate such environmental issues as presented in the media both now and in the future.

Content

The issues:

Acid rain
Conflict over conservation problems and the provision of a visitors' centre in The Burren, Ireland.
Nuclear power

Module Co-ordinator

Science Lecturer

RECEPTION OF SCIENCE

Second Year
Single Module
Core Module

Aims

1) To introduce students to the approaches, concepts and research relevant to considering how different groups receive and understand scientific information and ideas;

2) Building on skills development in the first year Computing (CNGM) and Communicating Science modules, to enable students to design and conduct their own research into some aspect of the popular understandings of science, and to re-present the findings of this research in an appropriately designed form.

These studies will be linked to students themselves developing and conducting a small-scale piece of 'audience-research' to test public understanding of some scientific issue.

Module Co-ordinator:

Nils Lindahl Eliot

Content

Thinking about audiences: how are they constructed, socially? What kinds of people want to know about science, and why? Forms for understanding of the world: the idea of 'commonsense' and its application to causal understandings.

Researching audiences: research methodologies and tools; quantitative and qualitative approaches; experimenter effects.

Case-studies on the reception of scientific understanding: Corner et al and responses to nuclear risk; using the Public Understanding of Science Programme as a base and surveys of 'popular knowledge' of science, comparing deficit and other models.

SCIENCE JOURNALISM

Second Year
Single Module
Core Module

Aims

1) to introduce students to the development, structure and functions of science journalism.

2) to acquaint students with the treatment of science in the press through the analysis of coverage given to a range of science issues.

3) to develop practical skills in the effective communication of science in a variety of media.

4) to enhance student understanding of the relationship between science and news, and an appreciation of the problems and contradictions involved in that relationship.

5) to complement and build upon the skills, expertise and knowledge acquired in other modules of the degree, in particular the first year Communicating Science and Investigating the Science in Contemporary Issues, and the second year modules The Reception of Science and The Scientific Analysis of Environmental Issues.

1) the study of science journalism: to include the history of science in the press, the rise of the specialist science journalist, general science coverage in the present day press.

2) the analysis of science issues: focusing on a number of science issues and comparing the treatment of those issues across a spectrum of publications. It is envisaged that the issues chosen each year will correspond to those being studied in the second year module, (SAEI).

3) practical skills: identifying news in science and presenting science as news. Skills would cover a range of forms including news story, feature, press release, information sheet.

Module Co-ordinator:

Human Bio
Lecturer

Content

Attention is focused in the module on print journalism and is woven together from three strands:

SCIENCE FICTION, FANTASY AND UTOPIAN WRITING

Third Year
Single Module
Humanities Area Option

Aims

1. To explore the ways in which science fiction critiques the cultural and social order.

2. To trace chronologically the genres from the Renaissance to the present day.

3. To investigate the reasons for the scarcity of women writers in these areas until this century.

4. To differentiate between science fiction, science fantasy and utopian literature.

Content

Utopias from the Renaissance to the Enlightenment

Science Fiction and Technology

Apocalyptic literature and Dystopias

Please note: *The content for this module is likely to change due to different staffing arrangements. If so you will be notified of such at the start of the year.*

Module Co-ordinator

Humanities Lecturer

COSMOLOGY AND SPACE SCIENCE

Third Year
Single Module
Science Option

Aims

1) To provide an appreciation of the current views about the universe, its formation, structure and evolution.

2) To enable an understanding of the methodologies and techniques in science and the specific difficulties in applying them to cosmology.

3) To provide an overview of the instruments (ground-based, orbital and on deep space missions) available to astrophysicists and planetary scientist.

4) To give an insight into the work of an astrophysicist or planetary scientist.

5) To develop an understanding of the communication and reception of Space Science, and examine the wider impact of the subject.

6) To develop further computing, numerical and experimental skills.

Content

1) The Big Bang

The origin of the Universe: The evidence, alternative theories, current thinking of the Big Bang.

2) Galaxies

Structures and classification, sizes. Formation and evolution. Clusters and super-clusters. The Milky Way.

3) Stars

Observations and measurements. The HR Diagram. Classification of stars. Stellar formation and evolution, supernova, nebulae and pulsars. Unusual stars, variable stars, binaries and stellar clusters.

4) The Solar System

The evidence: The planets and their properties, comets and asteroids. Theories of solar system formation, formation of planetary atmospheres.

5) Radio Galaxies

Observations and current thinking. Their importance.

6) Measurement Techniques

Measurements of distance, direction, surface temperature of stars, spectra, masses and periods of binaries, luminosity. The effects of the atmosphere.

6) Instruments

Telescopes, radio telescopes, X-ray and UV devices. Case studies of the Mariner and Voyager Missions (for example). Non-photographic imaging techniques and computer enhancement/processing.

Module Co-ordinator

Science Lecturer

LITERATURE AND MEDICINE

Third Year
Single Module
Humanities Area Option

Module Co-ordinators

Humanities Lecturer

Aims

1. To explore the special affinity between these two disciplines.

2. To sound out a dialogue between medicine, nursing and health care and literary history and criticism, where literature and medicine intersect .

3. To investigate the imagery of disease.

4. To examine the cultural concepts governing sickness and health.

Content

The idea that medicine protects life and literature interprets it, is the starting point for this module which explores the special affinity between these two disciplines. The area in which literature and medicine intersect will serve to sound out a dialogue between medicine, nursing and health care and literary history and criticism. This module will look at ways in which literary texts illuminate issues in health care and medical ethics, the place of the healer in society, women and medicine and notions of literature as medicine in its therapeutic context for both patient and practitioner. The imagery of disease from medieval humours to AIDS as well as the cultural concepts governing sickness and health will another concern of the module.

CALENDAR 1994-5

TERM 1

26th September - 16th December
(Year 2 and 3 start 3rd October)

TERM 2

9th January - 24th March

TERM 3

24th April - 23rd June

EXAM WEEK

26th June - 30th June

READING WEEKS

7/11/94 - 11/11/94

6/2/95 - 10/2/95

BANK HOLIDAYS

Monday 8/5/95

Monday 29/5/95

STUDENT UNION MEETINGS
(Lecture Free Afternoons)

All held at between 12.30pm and 3.30pm.

Monday	17/10/94
Tuesday	29/11/94
Thursday	26/1/95
Tuesday	7/3/95
Friday	5/5/95

AWARD MANAGEMENT COMMITTEE MEETINGS

Wednesday	16/11/94
Wednesday	15/2/95
Wednesday	17/5/95

ASSESSMENT CALENDAR Year 1

"SET BY" DATE	SUBMISSION DATE*	MODULE	VALUE OF ASSESSMENT
Wed 16/11/94	Wed 30/11/94	DSCC(S)	20%
Fri 18/11/94	Fri 2/12/94	DSCC(H)	20%
Wed 30/11/94	Wed 14/12/94	MPLP	20%
Wed 14/12/94	Wed 18/1/95	ISCI	20%
Wed 14/12/94	Wed 18/1/95	CNGM	20%
Fri 13/1/95	Fri 27/1/95	CS	20%
Wed 18/1/95	Wed 1/2/95	MPLP	20%
Wed 18/1/95	Wed 1/2/95	DSCC(S)	20%
Wed 1/2/95	Wed 22/2/95	DSCC(S)	20%
Fri 3/2/95	Fri 24/2/95	DSCC(H)	20%
Wed 1/3/95	Wed 15/3/95	ISCI	20%
Wed 22/3/95	Wed 26/4/95	MPLP	30%
Wed 22/3/95	Wed 26/4/95	CNGM	30%
Wed 22/3/95	Wed 3/5/95	ISCI	30%
Fri 24/3/95	Fri 5/5/95	CS	30%
	Fri 26/5/95	DSCC(CONFERENCE)	20%
	Fri 31/5/95**	CS	50%
Fri 5/5/95	Fri 19/5/95	All Modules, all years	All Revised Assessments
	Fri 9/6/95	DSCC(H)	50%

All work must be submitted by 12.00 noon of the submission date
***date for final personal report. Other deadline dates to be noted within this assessment.- 13/3/95;final script and 19/5/95,video project*

EXAMINATIONS

All examinations will take place in the week beginning 19/6/95:

CNGM	50%	Three hour seen examination
MPLP	30%	Two hour open-book examination
ISCI	30%	Two hour open-book examination
DSCC(S)	30%	Two hour open-book examination

ASSESSMENT CALENDAR Year 2

"SET BY" DATE	SUBMISSION DATE*	MODULE	VALUE OF ASSESSMENT
Wed 2/11/94	Wed 16/11/94	RS	20%
Fri 18/11/94	Fri 2/12/94	MPLP	10%
Fri 18/11/94	Fri 2/12/94	DSCC(S)	15%
Mon 28/11/94	Mo/Tu 12-13/12/94	DSCC (Conference)	20%
Wed 30/11/94	Wed 14/12/94	SJ	20%
Fri 16/12/95	Fri 20/1/95	MPLP	20%
Fri 16/12/95	Fri 20/1/95	SAE1	20%
Wed 1/2/95	Wed 15/2/95	DSCC (H)	30%
Fri 3/2/95	Fri 17/2/95	DSCC(S)	15%
Fri 24/2/95	Fri 10/3/95	MPLP	30%
Fri 24/2/95	Fri 10/3/95	SAE1	20%
Wed 8/3/95	Wed 22/3/95	SJ	30%
Wed 22/3/95	Wed 3/5/95	RS	50% (standard essay + oral)
Fri 5/5/95	Th/Fri 18-19/5/95	DSCC (Conference)	30%
Wed 10/5/95	Wed 24/5/95	DSCC (H)	50%
Wed 24/5/95	Wed 7/6/95	RS	50%

**All work must be submitted by 12.00 noon of the submission date.*

EXAMINATIONS

All examinations will take place in the week beginning 19/6/95

DSCC (S)	50%	Three hour unseen examination
MPLP	40%	Three hour open-book examination
SAE1	30%	Two hour open-book examination
SJ	50%	Three hour unseen examination

ASSESSMENT CALENDAR Year 3

"SET BY" DATE	SUBMISSION DATE*	MODULE	VALUE OF ASSESSMENT
Fri 4/11/94	Fri 25/11/94	Science Option (Cosmology)	10%
Wed 16/11/94	Wed 30/11/94	Humanities Option	20%
Wed 30/11/94	Wed 14/12/94	DSCC (Humanities)	20%
Fri 2/12/94	Fri 16/12/94	DSCC (Science)	20%
Fri 16/12/94	Fri 20/1/95	Science Option (Cosmology)	30%
Wed 18/1/95	Wed 1/2/95	Humanities Option	30%
Fri 17/2/95	Fri 3/3/95	Science Option (Cosmology)	30%
Wed 8/3/95	Wed 22/3/95	DSCC (Humanities)	20%
Fri 10/3/95	Fri 24/3/95	DSCC (Science)	20%
	Fri 28/4/95	INDEPENDENT PROJECT	200%
Fri 24/3/95	Fri 5/5/95	Science Option (Sci Tech and Soc)	50%
Fri 5.5.95	Thu/Fri18 -19/5/95	DSCC Conference	20%
	Wed 31/5/95	DSCC (Humanities)	50%
	Wed 7/6/95	Humanities Option	50%

**All work must be submitted by 12.00 noon of the submission date*

EXAMINATIONS

All examinations will take place in the week beginning 19.6.95

DSCC (S)	50%
Science Option(Cosmology)	30%
Science Option (Sci Tech and Soc)	50%

Part III

IMPORTANT NOTICES

1. HANDING IN COURSEWORK

Please read carefully the full regulations about submission of coursework elsewhere in your *Course Handbook*. What follows is a question-and-answer summary, to clarify matters.

WHY DO WE HAVE DUE DATES?

'Due Dates' are devised to ensure that all work is done on time, in relation to the aspect of the course to which it refers, and to ensure that all essays or other course work are marked and commented on by the staff, and then handed back to students and discussed with them, in time for this to provide useful feed-back and to play its full part in the learning process; to prevent any overwhelming 'log-jam' of written work; to structure a sequence of exercises giving cumulative practice at written expression throughout the year.

WHEN SHOULD I HAND WORK IN?

Dates when work must be handed in are clearly listed on the sheets headed Assessment Schedule in part II of this handbook. *Look ahead, and plan ahead* so that you don't leave work till the last minute. These dates are binding.

All assessable course work, without exception, must be handed in by 12.00 noon on the appropriate due date. There is a box marked on each site. Any course work for a module taught at must be posted in the box on that site; the same applies to
(In the exceptional case of coursework arising from the Conferences, they may be submitted on either site.) ***No marks will be given for work handed in late.*** If a piece of coursework is late, and you wish to offer reasons which might make it acceptable, you must write your reasons - enclosing, where appropriate, any medical or other evidence - and put them in a sealed envelope in the Box, with the coursework, addressed to the Examinations Officer.

WHAT IF I'M ILL?

(See the section 'What to do if you are ill' for further advice: this section just deals with what to do about your coursework).

If illness prevents you from handing in *Coursework essays*, projects, etc by the appropriate Due Date and you therefore need an extension, *or if you believe that your performance in a particular piece of written work has been affected by medical factors*, you must notify the staff concerned (see next section) as soon as possible, and before the Due Date if you are able to manage it.

SUPPOSING I NEED AN EXTENSION?

Extensions will normally only be authorised in cases of illness or severe personal circumstances. If you feel you need an extension for a piece of coursework, you must approach one of the following people:

They are the only tutors authorised to grant extensions on coursework. Please remember that *you must not assume that an extension will be granted, and that extensions will not be granted if the tutor feels that your problems arise from bad work organisation on your part.* You must always seek extensions in advance of the due date for submission of a piece of work. Retrospective extensions will not normally be granted.

REQUIRED STANDARDS OF GOOD PRACTICE IN PRESENTING WRITTEN WORK

The following rules should be followed in all written work you do on the degree.

1. Put your *name*, initials only (ie J B Smith, not John Smith), your *tutor's name*, the *course name*, the module title and the *due date* of the piece of work on the front of your essay.

2. Write on *one side only* of each sheet.

3. Number the pages consecutively.

4. Normally all coursework must be typed for submission. (*Please see the Note at the end of this section on this point.*)

5. Leave a generous margin on the left-hand side of each sheet. This space may be used by the marker to make comments.

6. Except for the exception noted below in 7, all quotations should begin and end with quotation-marks. For example: As Rousseau says, "it is not easy for a man to begin to think".[1] This is an example of good practice in quoting.

7. When you type, you should double-space your work except in the case of long quotations (upwards of approx. 30 words). Long quotations should be indented by 5 spaces and single-spaced. Indented quotations need no quotation marks as the indentation itself indicates that a quotation is being given.

8. Whenever you refer to a title in your text, you should highlight it by underlining or italicising. Be consistent in whichever you choose. This applies to the titles of books, novels, plays, long poems, TV programmes or series, newspapers - everything where you are referring to a whole item. Thus: The Times, On The Origin of Species, The Making of the English Working Class. The titles of parts - episodes of a series, essays from a collection, the titles of newspaper articles - should be placed in inverted commas. Thus: 'The Rise of the Mammals' (Life on Earth), 'Thatcher Resignation Shock Horror Admission'.

NOTE: *It is expected that by the beginning of the second term of Year One all coursework will be typed for submission. If you do not yet have word processing skills, short courses are available, run by staff from the Computer Centre - but it is your responsibility to arrange to use these. Any work submitted handwritten after this date will be returned to you as unacceptable. (If there is a good reason why you are unable to meet this condition by the beginning of the second term, you must see one of the four people who are able to grant extensions in advance of submitting an untyped piece of coursework to secure their agreement, as with an extension. This extension will not operate beyond the second term.)*

There is one exception to this typing rule. Work which requires mathematical symbols or displays not readily available on a word-processor may be submitted untyped. Please check with your Tutor as to which work this may apply to.

9 ***Referencing***. Every piece of work which you submit must contain both a reference in the body of the text and a bibliography at the end of the text. Why is this

important? Conventional systems for referencing and footnoting exist for a number of reasons:

a. to give direct sources for all quotations;

b. so that the reader of your work can easily go to the sources you have used;

c. to give sources for any paraphrased information - especially when you use a term or idea peculiar to a particular book or person;

d. to give sources of statistical information, maps and diagrams;

e. to give 'back-up' for a generalisation;

f. to give the source of case-studies or examples.

HOW TO REFERENCE:

There are two acceptable systems.

A. The Modern Languages Association system. This has three parts.

i. In your text you put a Footnote number at the end of the quotation or appropriate sentence (as we have in 6 above).

ii. You then give full information in your Footnotes on the source you have used.

iii. At the end of the work you give a full Bibliography of all the works you have used, whether or not you have mentioned them in your Footnotes.

In the MLA system, a Footnote has four main parts: ***author's name***, the ***title, publishing data, and a page reference***.

A book should be referenced as in the following example:

Northrop Frye, Anatomy of Criticism: Four Essays (Princeton: Princeton University Press 1957), p.52.

An article should be referenced as follows:

J Smith, "The Decline of England", The Economist, vol. XX, no. 3, 1963, pp. 301-2.

Essays in an edited collection should be referenced as follows:

Andy Medhurst, "Batman, Deviance and Camp", in The Many Lives of the Batman, Roberta Pearson and William Urricchio, eds. (London: BFI 1990), pp. 149-63.

Other kinds of material, such as TV programmes, should be referenced using these as a basis. For example:

"The Taste of Fear", episode of The Sweeney, BBC1 19 March 1984.

Subsequent references to a title which you have already referenced in full should be abbreviated to the author, title and page number

B. **The Harvard system.** References in the body of your text should conform to the following format:

i. direct quotations require ***author, date, and page number***, eg:

Boardman (1991, p.38) concluded that "The risk of erosion on ploughed land can be minimised by retention of stubble through the winter...";
or Following a detailed survey it was concluded that "the risk ... during the winter..." [Boardman 1991, p.38)

ii. if you paraphrase someone, give ***author*** and ***date***, eg:

Urban phenomena are viewed as the spatial results of the accumulation process (Harvey 1982);

or Bowen (1977) dated the upper loam of Gower as Late Devensian

iii. if you quote or paraphrase jointly authored material, you must give both authors' names - for example, Jones and Smith (1988). If it is more than two authors, then Simpson *et al* (1989)

iv material extracted from several sources should be shown in the following way: Experiments have shown that ice moves under gravity (Brown 1979, 1981; Smith and Brown 1984; Simpson et al 1989).

Bibliography:

Your Bibliography should list all the works you have used, whether or not you have directly cited them.

We would prefer that they are listed in alphabetical order of author.

You should provide the author(s), the full title, the place of publication (either the place and name of the publisher, or the title of journal or etc), and date of publication.

If you cite an article/essay from a journal or collection, you should give the page numbers of your item.

More presentation advice

10. Fasten all the sheets of your work together securely, using either staples or putting them in a folder or plastic wallet. Do not use paper clips.

11. Proofread everything before handing it in.

12. Keep a copy of the work you have handed in.

13. Submit it by the Due Date to one of the boxes unless told otherwise.

WARNING: TAKE CARE NEVER TO PLAGIARISE - PLAGIARISM IS A SERIOUS OFFENCE. GOOD REFERENCING PRACTICE WILL HELP YOU AVOID THIS.

WHERE SHOULD I HAND IT IN?

For the modules you take at there is a 'post box' near the Humanities Office. Post your work in the box, by 12 noon on the appropriate date. A similar arrangement applies at

WHEN CAN I THROW MY WORK AWAY?

Only when you've got your Degree.

You must preserve your written and assessed course work in a permanent portfolio. Apart from its value for revision purposes etc, such work must be available for both internal and external examiners to consult, should the need arise, when the final results of degree examinations, or any viva voce examinations, or student appeals, are being considered, and you will be asked to hand all your work in again during the last weeks of your course. Don't lose it.

HOW CAN I MAKE IT SUCCESSFUL?

Because this is a diverse degree course, there is not one universal set of criteria for coursework. But each module will try to make clear to you how you can make sure that your work not only meets minimum standards, but receives a good mark. If you are in any doubt, please ask your individual Tutors, or raise it as an item for clarification by your student representatives.

HOW LONG SHOULD IT BE?

In the Assessment Regulations you will find a general statement which should make clear what are the expectations for each

kind of work you are asked to do. If you are in any doubt, ask your tutor. It is only fair to warn you that while Tutors will be too busy to count the exact length of each piece of work (!), if a piece of coursework is obviously well in excess ofthe required length, you may suffer the penalty that not all of it will be marked.

DO I HAVE TO TYPE IT?

From the beginning of the spring term of year one all work handed in for assessment is expected to be typed unless there are exceptional circumstances.

2. A WARNING ABOUT PLAGIARISM

All students are warned that *unacknowledged use of source materials* in any written work submitted as part of their work for the degree may be held to constitute the offence of plagiarism. Plagiarism is the counterpart ofcheating under examination conditions. Any suspected case of plagiarism will be investigated; and where it is established that a student has committed the offence, the penalties are severe: they include the automatic forfeiture of the award of the degree, under University regulations, as well as disciplinary action by the University.

Full detail on what exactly plagiarism is - and how to avoid it - is to be found in Section 10. Please READ IT.

3. WHAT TO DO IF YOU ARE ILL - OR OTHER THINGS GO WRONG

As soon as possible either telephone either the Science or the Humanities Department Office yourself, or ask a friend to telephone or take a message on your behalf.

If you are ill for longer than a week, you must ask for a medical certificate from your doctor, and this must be handed in (in a sealed envelope) to one of the Course Advisers.

Examinations

Absences from examinations must always be covered by a medical certificate or a doctor's letter even though the illness may have lasted for less than a week. If you find difficulty in obtaining a certificate or letter from your doctor you must inform one of the Course Advisers OR the Chairman of the Examining Board

4. EXTENUATING CIRCUMSTANCES

It may be that you find yourself in a situation, medical or personal, which, though not causing you to miss any deadlines or exams, may affect your work in some way.

If you would like to draw your situation to the attention of the Examination Board, this is what you should do:

Make a statement in writing, backed up by medical or other professional evidence if possible, and give it to one of the Course Advisers.

If the evidence is accepted, your name will be recorded at the meeting of the Examination Board. In some circumstances (eg if your marks are on the borderline) your case will be discussed with the External Examiners, to whom your statement will be made available. You can be assured that other than this any information which you submit is regarded as confidential.

5. DYSLEXIA

If you are dyslexic, or think you may be, you are invited to make an appointment with the University's educational psychologist who is able to give a proper assessment of your problem. If your condition is confirmed, you should arrange to see one of the Course Advisers who can make exceptional arrangements for the submission of coursework and the sitting of examinations.

6. HOW TO CATCH YOUR TUTOR

You will be working on both the and sites. Also, both Science and Humanities tutors work at other University sites, so you may not find them available on site every day.

The best thing to do is to make an appointment, then you're sure to meet your tutor. Staff will also leave notices on their study doors, indicating exactly when they are available to see you. Staff room numbers can be found in Part III of this handbook. Please make sure that you go along at the appropriate times and then you won't be disappointed.

Don't go along "on the off chance" - staff are working under tremendous pressure because of severely limited resources - and though (no doubt) they'd love to talk to you at any time, it's just no longer possible.

7. WHERE TO GO IF YOU NEED HELP

1. The University Student Services at offers a variety of services for those who need help (eg counselling, careers, accommodation etc). Appointments can be made by ringing ext 2562 at . In addition, if you need help or advice, the following people will always be glad to help if they can, but because of teaching commitments elsewhere they may not always be available, so it's as well to make an appointment if you wish to see them.

2. Your Personal Tutor

3. The Course Advisers:
(yr1) and (yr2) (Science,
and (yr3) (Humanities,

8. ATTENDANCE AT SEMINARS, LECTURES, etc

It is our expectation that you will normally attend all lectures, seminars, tutorials, laboratory sessions and other timetabled sessions unless you are prevented by something like illness. Tutors will generally keep a list of attendance at all sessions. If tutors become aware that you have missed a number of sessions, they will want to find out why, simply because absence can often indicate some sort of problem. But you are reminded that the Assessment Regulations empower the Board of Examiners to "take account of all factors in a student's performance" when arriving at a final degree result.

If there is any problem in your results which requires the Board to arrive at a judgement in your case, then it will take note of whether you have performed conscientiously during your course. One way in which your conscientious performance is assessed is by the regularity of your attendance at seminars, lectures, workshops and so on.

WE WANT TO HELP, BUT....

Please note that it is your responsibility to notify the appropriate subject tutor or your

problems of health, or any other factor that may affect your work (for instance, difficulties in your domestic circumstances or in your personal life, or with alcohol or drug dependence).

We are anxious to offer you all the help we can when things go wrong, but we can't help unless you tell us.

9. CAREERS ADVICE

Thinking about the future after you leave the University is something we encourage you to do while you are still at the University and it is never too early or too late to start exploring. The following timetable of what to do when may help.

Autumn Term

First year students - a settling in time but occasionally some students think perhaps they have made a mistake and would like a chance to talk it through, discuss other options and so on. If so the careers adviser is a person you could talk to.
Careers talks - during this term a variety of speakers will be coming in, normally over lunchtime on a Thursday, to give some insight into what they do and to answer your questions. There will also be some general seminars on completing applications, postgraduating study and interviewing.
Final year students - should collect copies of ROGET, GO and GET directories of employers from the Library during this term - and be thinking about future career direction. Applicatinn for some courses and jobs will need to be made this term.

Spring Term

The Milkround - employers with many different types of jobs visit the University to interview students. The brochure with details of which firms are coming is available in December/January - copies in the Library. Applications for many jobs and courses should be made now.

Careers talks - the series of careers talks begin in the Autumn term and are continued - of use to all students not just finalists.

Summer vacation work - second year students especially please note, if you are interested in a placement in the summer where you can gain an insight into different careers, now is the time to apply. Locally Gateway, Sainsbury's and City Council as well as insurance, accountants and solicitors are all worth contacting. Gateway run a variety of schemes including areas such as Training and Personnel. There is also the new teachers scheme for those thinking about teaching.

Summer Term

Second year students - this actually is a very good time to start exploring career options if you have not already started.

Final year students - exams begin to take up most of your time but applying for jobs and going for interviews may continue.

First year students - may like to start thinking about their future especially in the light of option choices.

The Help Available:

The Careers Advisers and are both available to you. Appointments can be made by ringing , Extn 2570 or by calling in at the Careers Office.

In the Library there is a range of careers material. Some of this is for you to take, others for reference and marked accordingly. If you cannot find what you are looking for ask, as at we have an extensive Careers Library.

At you are welcome to come and use our Library and computer which can help with the career choice process.

10. STUDY SKILLS

CHEATING, COLLUSION AND PLAGIARISM - HOW TO AVOID THEM

Definitions

1.1 Cheating (in the widest sense of the word) is the use of unfair means of presenting work for assessment. It is a serious academic offence as it prevents examiners from being able to make a realistic judgement of a student's knowledge, understanding, ability and/or creativity.

1.2 Cheating in an examination includes:

a) taking aids (eg notes, books, equipment) into an examination room which are not authorized for use in that examination

b) copying another student's work

c) seeking or obtaining help from another person

d) assisting another student with an examination

1.3 Collusion includes:

a) presenting work as one's own which is derived from unauthorised collaboration with others

b) assisting another person by giving substantial help with ideas or with text which are not then acknowledged.

1.4 Plagiarism is a form of theft. It includes:

a) the quotation of another person's words without quotation marks

b) the quotation of another person's words or ideas without acknowledgement

c) the use of another person's ideas without acknowledgement

d) the use of another person's facts or experimental results without acknowledgement.

1.5 It is also an assessment offence to prevent another student from being able to be examined properly.

Avoiding Cheating in Examinations

2.1 Students can ensure that they do not unwittingly cheat in examinations if they

a) take into an examination only those items which have been authorized. Particular care must be taken with programmable calculators and dictionaries which can only be used if specifically mentioned in the instructions on the question paper

b) follow carefully the "Instructions to Candidates" (Examination Regulation 2) and communicate with no one except an invigilator during an examination.

Avoiding Collusion

2.2 Most collusion is unintentional. Students are often required to work on a topic or activity in groups and then to produce individual work for assessment. They must be careful to follow the instructions regarding the assessment. Some assessments may require the group to produce joint ideas or proposals, whereas others might assign this initiative to the individual. Unless the instructions specifically require a group report, students must produce their own written work without the help of other people.

2.3 It is a normal part of the learning process for students to discuss ideas of written work with each other. However, students should be cautions about lending unassesssed essays, computer programs or laboratory reports to other students in order to avoid the danger of the second student producing an essay or laboratory report similar to that of the first student.

2.4 Discussion between students is a good way of learning: however, students should be careful to ensure that they think out and write the detail of their essays/ assignments by themselves.

HOW NOT TO PLAGIARISE

1. What is plagiarism?

In essence, plagiarism is thieving somebody's words and/or ideas and attempting to pass them off as one's own.

-This form of mental shop-lifting can take a variety of forms.

-It can be intentional or inadvertent, thorough or sporadic.
-It can entail copying from published sources or from other students' essays.

-But in the end, it's all still plagiarism.

2. What is policy on plagiarism?

-In a word, severe.

-Once a work is formally deemed to have been plagiarised,the work is failed and the student goes in front of a specially constituted plaqiarism board.

-Depending on the circumstances, a student may be expelled from the course for plagiarism.

3. The books say it so much better than I can, it's difficult not to borrow passages.

-Remember, lecturers would rather read your clumsy but: genuine attempt to articulate an idea for yourself than high-sounding words recycled on the sly.

-When you attempt to digest an argument, however inelegantly, you are Mediating the material. This impresses far more than stringing together undigested gobbets of what you've read. The latter is known in the ranks as a 'scissors and paste job' and tends to be condemned as third-rate stuff, even when plagiarism is not the issue.

4. But how do I protect myself against charges of plagiarism? -Simple. All you need to do is to footnote.

5. But when do I need to footnote? After all I have to get most of my ideas from the books assigned.

-When in doubt, footnote.

-Always footnote direct quotes.

-Always footnote statistics.

-Footnote passages you paraphrase closely.

-When you make an observation or general assertion because other authors have made them-credit the authors.

6. That's ridiculous! Footnoting is academic posing and a waste of time .

-No, it's a way of verifying you've quoted correctly.

-It's a way of ensuring you did not misrepresent or fabricate evidence.

-It's a way of giving credit where it's due.
-It's a way of demonstrating to your readers that you are aware of where you— obtained your information.

-Footnotes can be used to show how widely you've read and well you've mediated the material. (For example, instead of, 'It is generally agreed that the industrial revolution was technology-led', You could put: 'According to some authors, the industrial revolution was technology-led.'

Penalties for Cheating

The University has a procedure for investigating allegations of cheating, collusion, plagiarism or any other unfair means (Examination Regulation 5). It involves a formal allegation of an "assessment offence" being investigated. The penalties for an assessment offence include failing the whole course. It is in students' interests to ensure that their work is always their own and produced fairly.

11. THE LIBRARY

There are 4 libraries in the polytechnic altogether. Each site has a wide range of books, journals, abstracts, indexes, bibliographies and CD Roms. The most relevant sites for [illegible] are [illegible] and [illegible]. All sites record their stock on one common catalogue. This means that from any site you can find out where items are kept in all the libraries. This system is called LIBERTAS, and the terminal you use is often called an OPAC. This system can also tell you whether an item is on loan or not. If it is on loan you can make reservations at the OPAC. You can also reserve items at other sites and have them delivered to your local site.

It is very important that you learn how to make the most of the library. All first year students have an introduction to the library as part of their induction. This is followed by a more detailed session a couple of weeks later when you will learn how to look for what you need in the library. You will be given more specific information about the library then.

For second years there are sessions at the beginning of the year to develop your library and information skills. Just before you begin work on your independent project during the third term there will be a session on literature searching and relevant sources of information. Students can borrow up to 13 items from the University libraries at any one time. There are 3 loan periods:

Long loan books may be borrowed for 3 weeks. Fines begin 6 days after the due date at 60p on the first day, and 10p a day thereafter to a maximum of £5 per book. You can renew these twice, as long as they are not overdue or reserved by another reader.

Medium loan books are stamped for 1 week. Fines start immediately the book is overdue, and are 20p a day to a maximum of £5 per item. These books cannot be reserved or renewed.

Short loan books are kept behind the issue desk. They can be borrowed 10am - 1pm 1pm - 4pm 4pm - 10am the next day. After 1pm Friday you can borrow them for the weekend until 10am Monday morning. Fines begin 20 minutes after the book is due at 20p an hour (or part thereof) up to

due at 20p an hour (or part thereof) up to a maximum of £10 per book. You cannot reserve or renew these books.

There are different areas in the library to cater for group work and silent study. You must not talk in the SILENT areas. You can, however, talk quietly in the QUIET areas.

The library is there for everyone. Often there may be only one copy of a book or journal in the library. You can always photocopy an article or pages from a book if necessary. Anyone defacing or stealing anything will face disciplinary action.

YOUR ROLE IN THE LIBRARY

You have two main contacts in the Library: , the Humanities Librarian at (find her in room 31, ext.240) and , the Science Librarian at the ;find him in room 3D34, ext. 2495).
This is a brief guide to how we can help you with your studies.

All courses place emphasis on "resource based learning" i.e.you have to go off and find the information you need for yourwork. The library is a major source of information for you.

Here are some of the questions you maybe asking plus a guide to What the Library Offers and the sources that you can use. At the end of each question, in a box, there is a list of the competencies (skills) that you need to develop.

HELP?

Subject librarians and other staff to help with your enquiries.

> Asking for help. Not being too shy to admit you don't understand.

DO YOU HAVE ANY OF THESE BOOKS ON MY READING LIST?

Computer catalogue often called an OPAC. Collection of books arranged in number order.

> Interpreting a reading list.
> Using the OPAC to find a location for an item.
> Using the OPAC to check if it is on the OPAC to reserve theitem, yourself, if necessary.

DO YOU HAVE ANY OF THESE JOURNAL ARTICLES ON THIS READING LIST?

An A-Z computer printout of all the journals held by loan. Using all four site libraries. This
list will soon be available via the OPAC too. The journals are shelved in A-Zorder.

> Interpreting journal references i.e. what is the correct name of the journal, what is the volume number, the part number, the page numbers?
> Interpreting the library's listings to find which site has which journal.

WHAT VIDEO HAVE YOU GOT ON THIS SUBJECT?

The library's videos are listed on the OPAC. You can spot them on the OPAC by the prefix letters VC (Video Cassette).

> Doing a "subject keyword" search onthe OPAC using the term "VC".
> Learning to use the library's video monitors.
> Booking the video equipment and room, for group use.

I CANNOT FIND ANYBOOKS ON THIS TOPIC, CAN YOU HELP ME FIND SOMETHING?

The collection may contain material on your subject but it does not have one book with a title that is as specific as your subject.

> Lateral thinking.
> To look for books on broader subjects that might containchapters on your specific subject.
> Or using encyclopaedia articles to get started.

I NEED INFORMATION ON THIS SUBJECT BUT I CANNOT FIND ANYBOOKS. CAN YOU HELP ME?

There may be other sources of information such as newspaper articles, journal articles, conference proceedings. The library has "abstracts" and "indices" to help you trace these other sources.

> Choosing a suitable index for your subject.
> Choosing suitable keywords to look up in the index.
> Learninghow that particular index works.
> Learning to accurately record the details of items found in the index and checking whether the library has any of them.

THIS SAME QUESTION MAY BE TACKLED USING I.T. TO PROVIDE AN ANSWER.

The library buys databases stored on optical discs called CD ROM. They can help you to trace articles which have been written on yoursubject when you do not have a reading list. (They are easy to use. They work using menusand they have good help systems. We can run tutorials on this if you need it. Relax!)

> Choosing the most appropriate database for your subject.
> Choosing keywords that describe your topic. Using those keywords to search the database.
> Printing out the references you find, or down loading them onto floppy disc.

HOW DO I GET HOLD OF THESE ARTICLES I JUST FOUND ON THE CD ROM? THE LIBRARY DOES NOT STOCK ANY OF THEM.

The library can obtain books and journal articles, for you, from other libraries. You apply on an inter-library loan form. It costs us a lot of money. So you will need the approval of your tutor before you apply for loans.

> Recording all the relevant details of a reference, and to noting the source of your references.
> Planning your work so that you have time to use inter library loans before your deadline. Some loans can take up to three weeks to arrive.

12. DEVELOPING A CAREERS STRATEGY

When to do what and why

Your strategy will depend on whether or not you wish to commence job hunting before graduation, and on the amount of time and energy you can afford to put into it and/or what is needed to be successful in the field you have chosen.

Where jobs are in good supply and your course is vocationally related to the

good applications in the Spring term could be all that is needed. More likely, however, you will have to think through your ideas, make a number of applications in the Autumn/Spring term and attend a number of interviews.

The whole process may take a long time. The length will depend upon the competition, the time you start, the economic climate, the time you devote to it and some luck!

Job hunting can be a time consuming occupation but there are ways of keeping it in proportion and if careful planning and thought is given it need not detract from your study time. The continuing economic recession of 1992 makes it more difficult to predict what will be needed in the future but the early bird catches the worm!

Employers know that students are available from July onwards and plan their recruitment cycle accordingly, with the majority of vacancies from the major graduate recruiters being advertised through "Future Vacancies" in the Autumn term. Milkround interviews in the Spring term save you time in travelling. For further details contact the Careers Service.

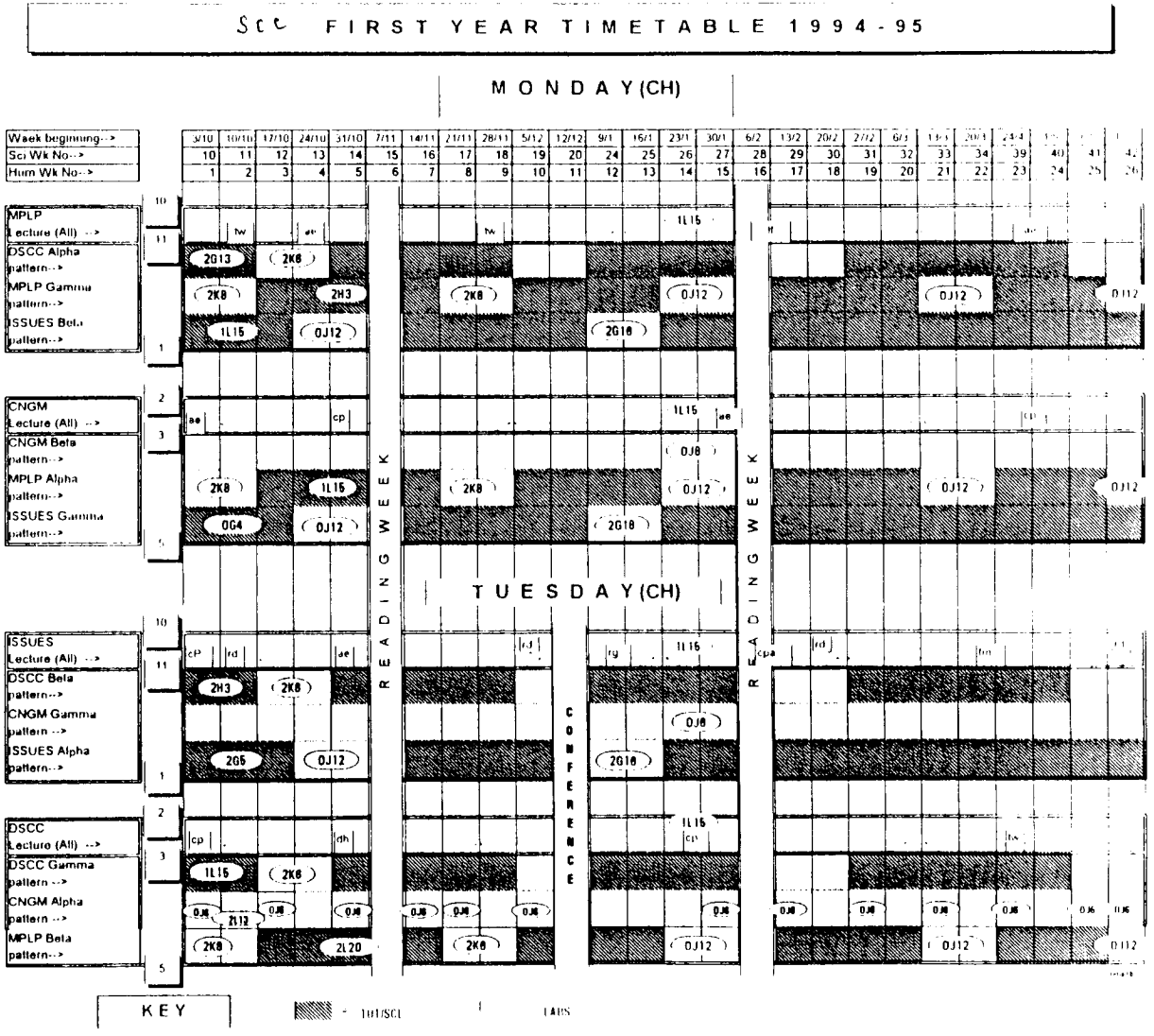
The risk in leaving it all until after the exams is that for some vacancies, certain firms will have already completed their recruitment and you may find you have to wait another year to enter those fields.

While having a break after study may be very useful, to have planned it in advance and done some preliminary thinking/ research on the future may save you difficulties later. Opportunities while at the University such as careers talks, seminars, interviews and the wealth of information may not be so easy to find once you have left the institution.

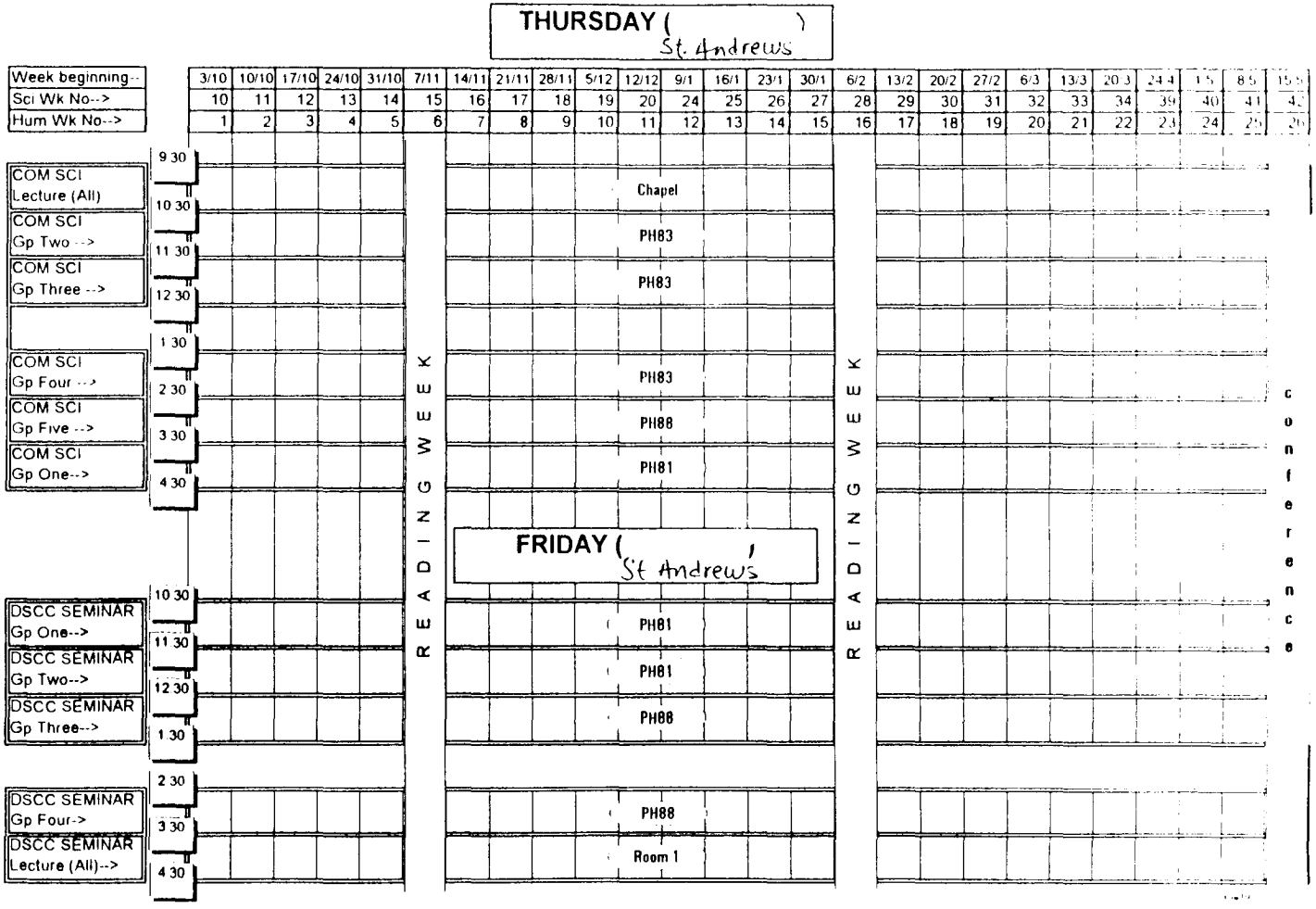
Any strategy you adopt may need to be modified and adapted as a result of experience or changed thoughts and ideas. However, forward planning and consideration of the options well in advance of leaving is likely to pay off even if the decision is still to concentrate on your exams. Your choice will be an informed one and any risks calculated, at least to an extent!

Given the situation at present with fewer vacancies and greater competition, it is important to start investigating early to find out what applies to you for your chosen fields.

Certain types of work are advertised on an ad hoc basis, as and when individuals are needed. For these types of posts you need to identify vacancy sources but actually apply two months or so before you want to start.

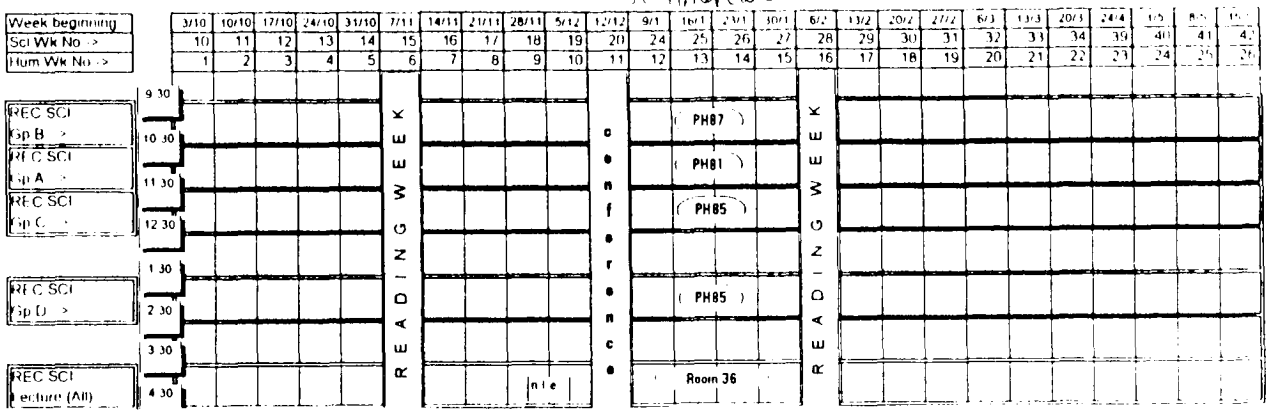

SCC FIRST YEAR TIMETABLE 1994-95
MONDAY(CH)
TUESDAY(CH)
READING WEEK
READING WEEK
CONFERENCE
Week beginning-->
Sci Wk No-->
Hum Wk No-->
MPLP Lecture (All) -->
DSCC Alpha pattern-->
MPLP Gamma pattern-->
ISSUES Beta pattern-->
CNGM Lecture (All) -->
CNGM Beta pattern-->
MPLP Alpha pattern-->
ISSUES Gamma pattern-->
ISSUES Lecture (All) -->
DSCC Beta pattern-->
CNGM Gamma pattern -->
ISSUES Alpha pattern-->
DSCC Lecture (All) -->
DSCC Gamma pattern -->
CNGM Alpha pattern -->
MPLP Beta pattern-->
KEY

SCC FIRST YEAR TIMETABLE 1994-95

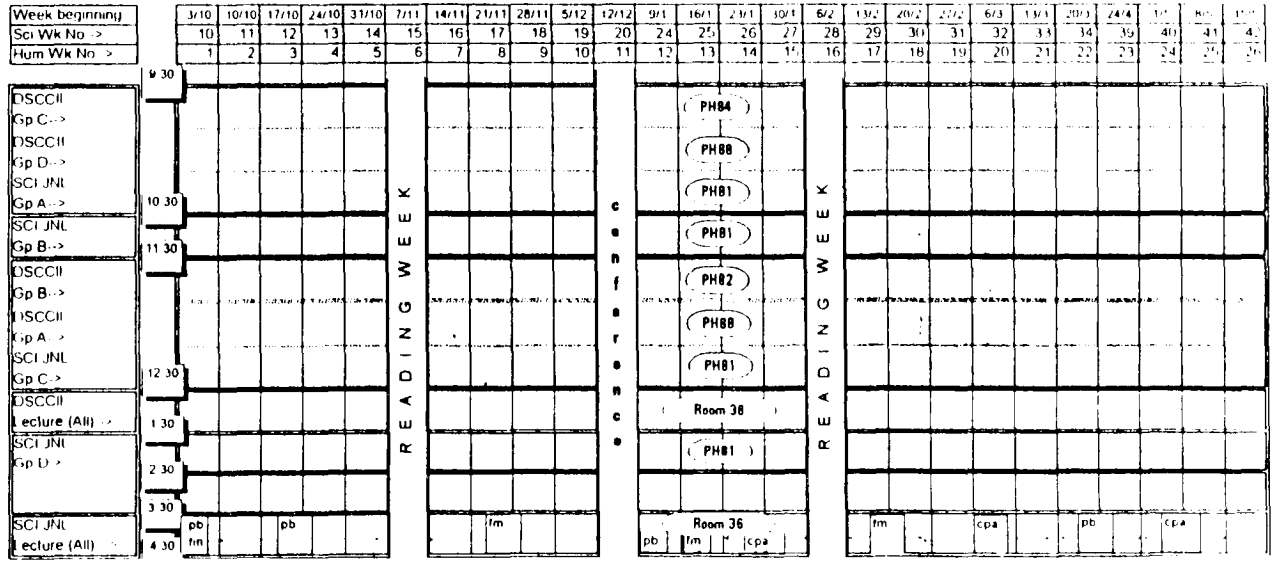


SCC SECOND YEAR TIMETABLE 1994-95

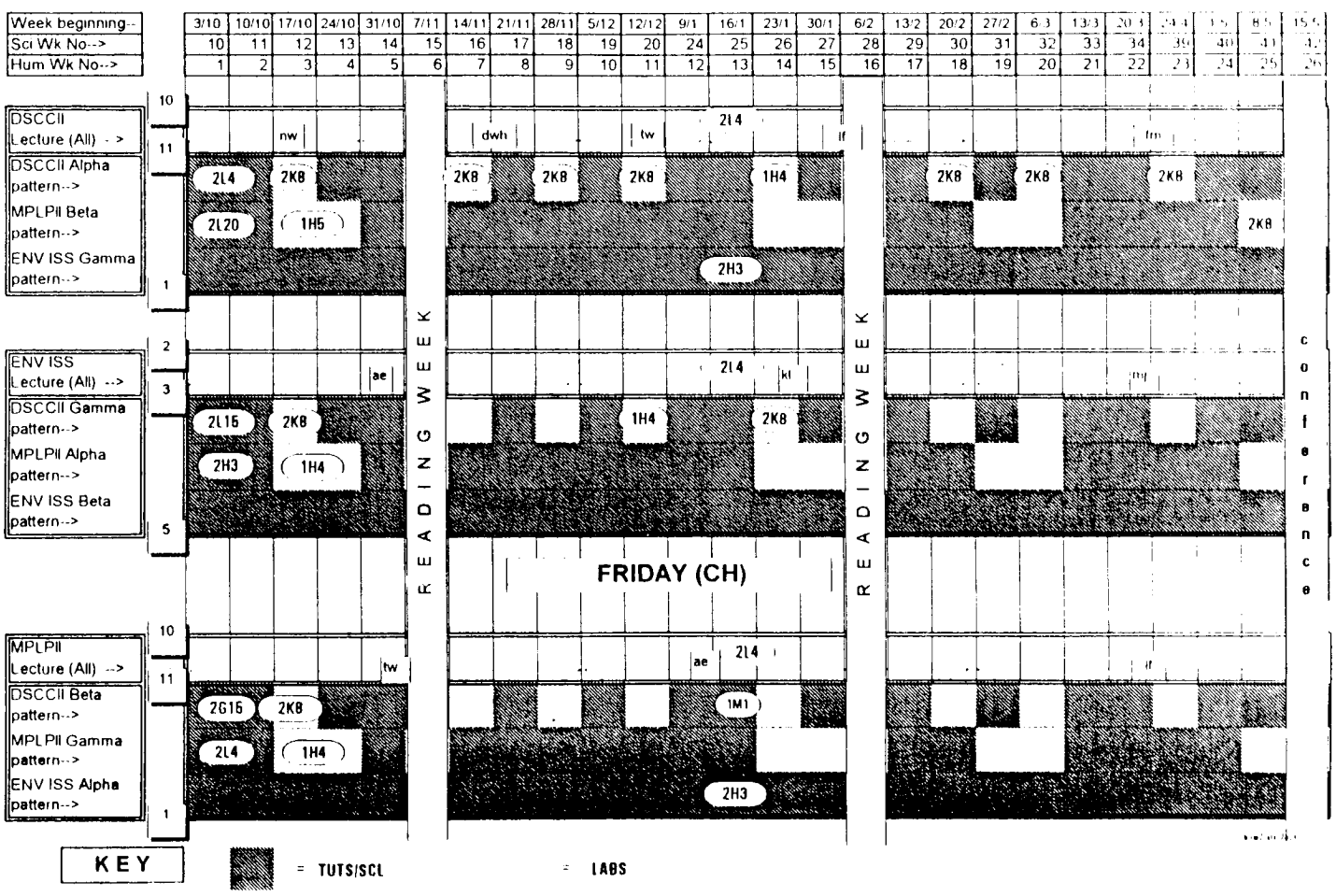
MONDAY (St Andrews)



TUESDAY (St. Andrews)



SCC SECOND YEAR TIMETABLE 1994-95



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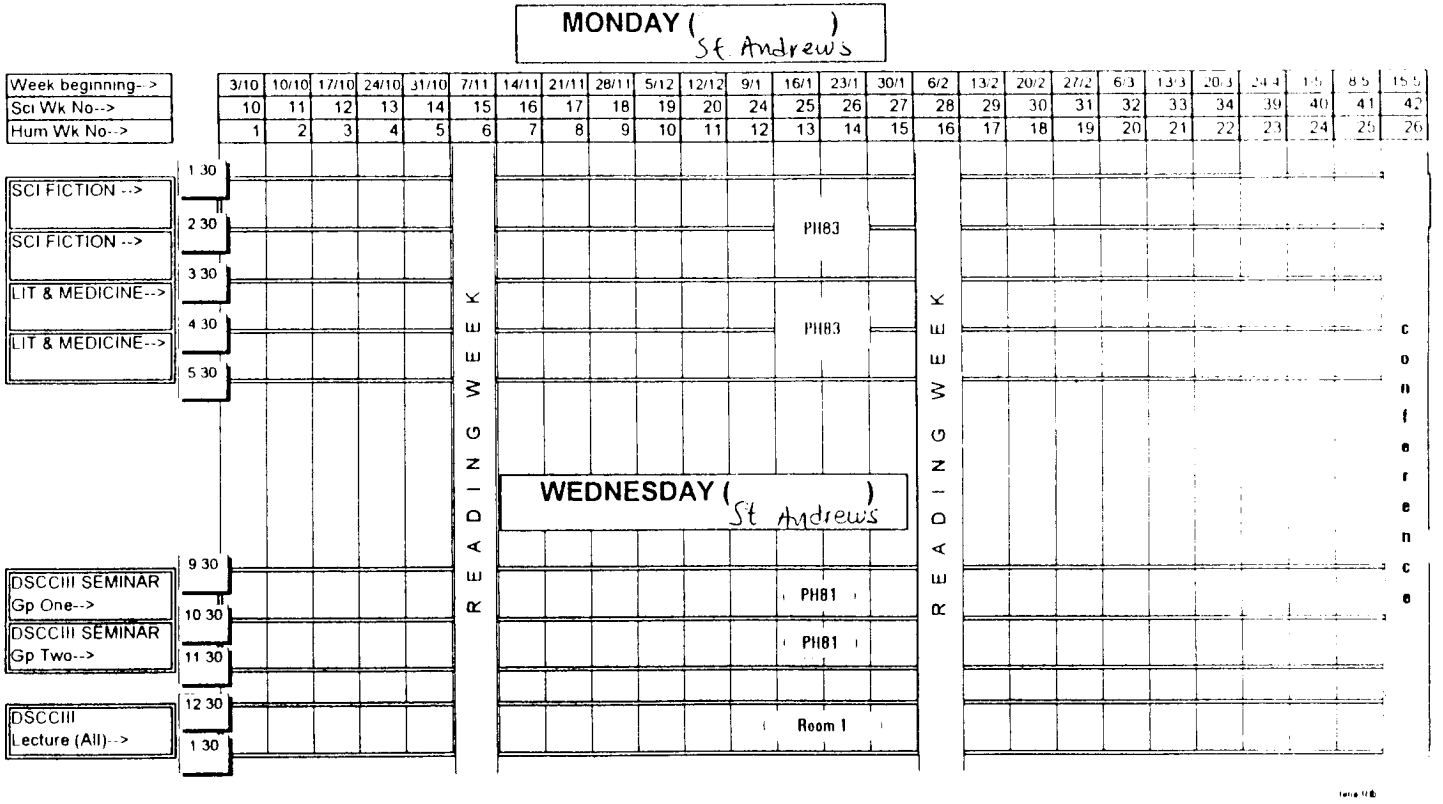
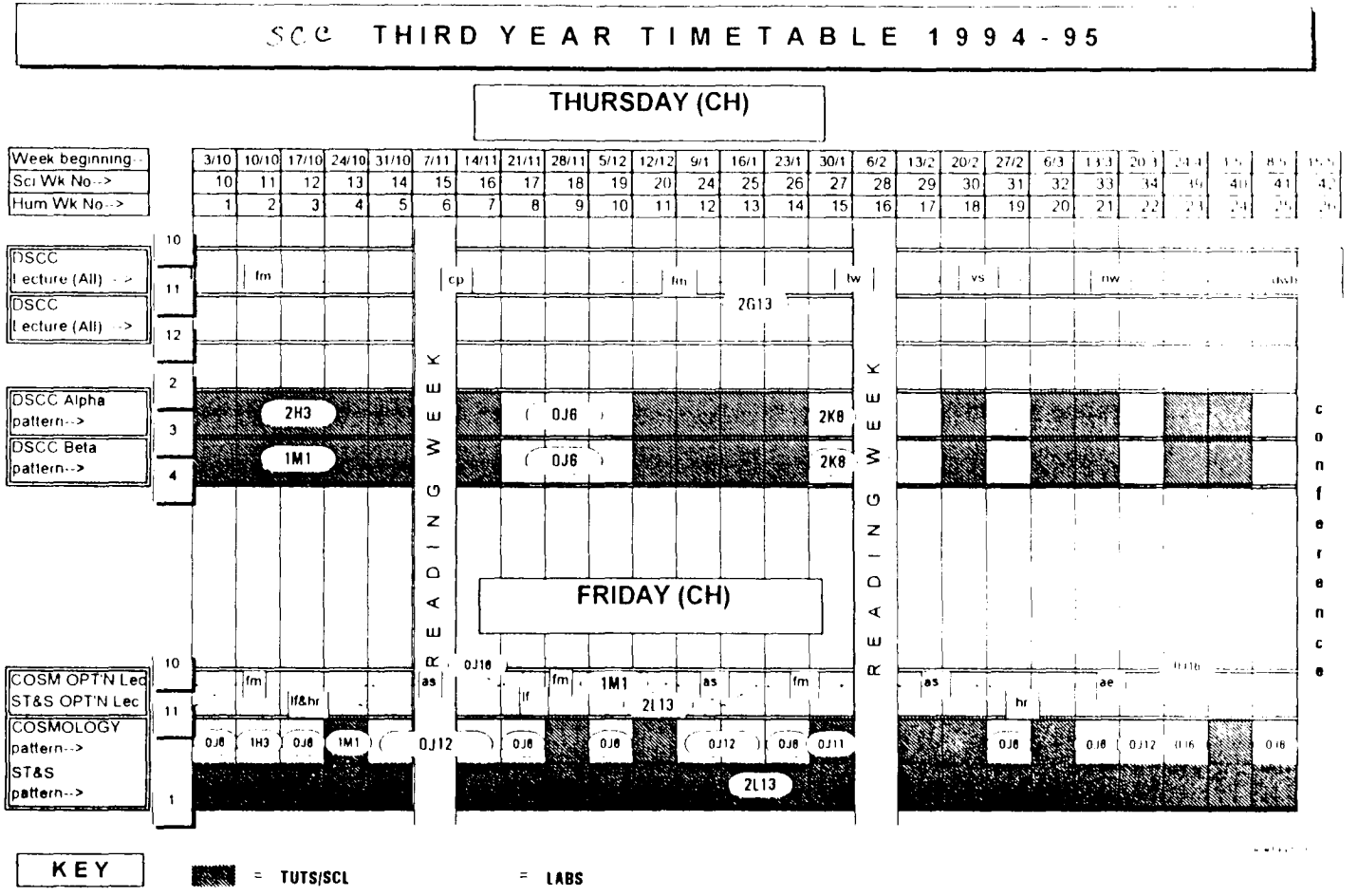



SCC THIRD YEAR TIMETABLE 1994-95
THURSDAY (CH)
Week beginning-->
Sci Wk No-->
Hum Wk No-->
3/10 10/10 17/10 24/10 31/10 7/11 14/11 21/11 28/11 5/12 12/12 9/1 16/1 23/1 30/1 6/2 13/2 20/2 27/2 6/3 13/3 20/3
10 11 12 13 14 15 16 17 18 19 20 24 25 26 27 28 29 30 31 32 33 34
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
DSCC Lecture (All) -->
DSCC Lecture (All) -->
DSCC Alpha pattern-->
DSCC Beta pattern-->
2G13
2H3
1M1
0J6
2K8
READING WEEK
FRIDAY (CH)
COSM OPT'N Lec
ST&S OPT'N Lec
COSMOLOGY pattern-->
ST&S pattern-->
2L13
1H3
0J12
0J11
conference
KEY
= TUTS/SCL
= LABS

Appendix IV

Course outlines provided by SCC lecturers

This appendix contains copies of the course outlines of some of the SCC modules (or parts of these modules: some of the module outlines are incomplete). Although I explain in chapter two that for reasons of space and focus I could not conduct an extensive analysis of each module, I have included these outlines to provide the reader with a better sense of the ways in which the different modules were structured.

These outlines were circulated amongst all lecturers for the first time in 1996, in response to the results of the staff-student meeting which I analyse in chapter four. (During that meeting, many students suggested that there was insufficient integration between the various aspects of the degree.) Although the outlines describe the modules one year after period which I investigated (1994/95), they still confirm the dynamics of classification and framing which I analyse in chapter two. Indeed, in one case, the use of a sex metaphor by one science lecturer (cf. MPLP I) can be regarded as an instance of the kind of patriarchal gendering of science studied by Merchant (1980) and others. The metaphor is gendered to the extent that it considers the "physics of sex" from the perspective of the male half of the process. This type of gendering process could be one of the reasons why there was a more negative orientation on the part of women taking the course, towards singular science modules and subjects.

Each of the outlines has a title at the top which identifies the module in question. Next to each week, there is an acronym that identifies the lecturer in charge of a particular lecture or unit. These acronyms enable the reader to realise the sheer size of the course, which was taught by a teaching team of twenty five lecturers.

WEEK	LEC	LECTURE	SEMINAR	WORKSHOPS
1	TJ	What is Knowledge?		
2	TJ	What is Knowledge (cont) The Search for Method: Galileo, Descartes, Newton		
3	TJ	What is knowledge (cont) The Search for Method: Galileo, Descartes, Newton		
4	TJ	What is knowledge (cont) Cosmology and the Copernican Revolution (Copernicus, Brahe, Kepler)		
5	TJ	What is knowledge (cont)		
6	TJ	The Medieval Inheritance: The classical intellectual legacy; Arab Science; the Church in the Middle Ages, Aquinas.		
7	TJ	The Renaissance (1) Humanism: Petrarch & neopletonism; hermeticism; Erasmum & Christian humanism; the Renaissance beyond Italy.		
8	TJ	The Renaissance (2) Art: Vitruvius, mathematics & perspective; naturalism; observation; illusion. Leonardo, Boticelli, Durer, Vasari, Alberti.		
9	TJ	Religeous Change (1) The Protestant Reformation: Luther, Calvin & Reformation theology; the Reformation & social protest, the revolution of 1525 & the Radical Reformation; the impact of the Reformation.		
10	TJ	Religeous Change (2) The Counter Reformation: The Council of Trent; the new orders; the Index & the Inquisition; Spanish mysticism; Jesuit science, the Baroque.		
11	TJ	Exploration and New World Encounters: Columbus; cartography; colonisation; geography; anthropology & indigenous populations; Las Casas, Sepuiveda, Victoria, Acosta.		
12	TJ	Death, Disease and Healing: The Galenic tradition; Paracelsus; Vesalius; Harvey; the social response to epidemics in early modern Europe.		
13	TJ	Absolution: Order, Disorder & the 17th Century "Crisis": Economy & society in the 17th C; monarchies & republics; the Thirty Years War; Hobbes; Locke; Louis XIV.		
14	TJ	Popular Culture: Lent & Carnival; Breughel; popular magic.		
15	TJ	The Witch Craze: The Malleus Maleficarum; incidence of trials; the decline of witch-hunting; witchcraft beliefs & rationality.		
16	TJ	The Trial of Galileo: Galileo; Bellarmine; the Jesuits; Science & Religeon.		
17	TJ	Institutionalisation of Science: Scientific academies; the Royal Society; Robert Hooke; Robert Boyle; atomism; absolutism.		
18	TJ	The Newtonian Revolution: Newton; mathematical mechancis; gravitation; natural theology.		
19	TJ	The Great Chain of Being, Macrocosm & Microcosm; early modern discourses		
20	TJ	The Great Chain of Being (cont)		
21	TJ	The Great Chain of Being (cont)		
22	TJ	The Great Chain of Being (cont)		

WEEK	LEC	LECTURE	SEMINAR	PRACTICAL
1	CP	Intro to SCC & DSCCI	Reading about SCC in CIBA Newsletter	
2	DH	Microscopy - Historical	Background to DSCCI - Science vs Technology	
3	DH	Microscopy - Pioneers		Measuring Animalcules
4	DH	Nomenclature & Classification	Original papers by Malpighi, Hooke, Leeuwenhoek	
5	DH	Blood and the circulation	A classification exercise; Linnaeus	
6		READING WEEK		
7	DH	Embryology (ovists vs animalculists)		Transmission & Scanning EM
8	DH	Differentiation of organs	Harvey's experiments	
9	CP	Aristotelian Cosmology & ideas on motion	SCL on who was Aristotle and what he did	
10	CP	Ptolemaic Epicycles & Retrogression	Calculation with epicycles	
11	CP	Copernican System & Naturalness	SCL - who was Copernicus, how work received	
12	CP	Copernicus - measuring the Heavens	Scientific American: Age of Columbus	
13	CP	Copernicus/Ptolemy and Kepler	How was Copernicanism "Natural" for Renaissance	
14	CP	Motion: Aristotle, Zeno, Da Vinci	Putting motion graphs into words	
15	CP	Galilean Kinematics: Free fall	Exploring falling objects from towers	
16		READING WEEK		
17	CP	Digression on light, eye, lenses & telescope		Inclined plane
18	CP	Galileo's celestial work & relativity		Parallax experiment
19	CP	Causality "Forcing the World"	SCL - who was Newton, what he did	
20	CP	Newton's Universal Scheme	Calculating terrestrial Acceleration.	
21	TW	Theories of Disease: Introduction with classification of disease & slides	"Ancient themes of balance" - Video on alternative medicine.	
22	TW	Ancient theories - Egypt/Greeks/Babylon	Readings from Translation of original ancient papers	
23	TW	Medieval medicine in Europe	Readings from 17 & 18th Century papers	
24	TW	Emergence of "Scientific " Medicine - Renaissance & Enlightenment.	Video - "Anatomy in the Service of Medicine"	
25	TW	Homeostasis - the Immune System		Staining & looking at Blood Films
26	TW	Homeostasis - Antibody Production		Staining & looking at Blood Films

WEEK	LEC	LECTURE	SEMINAR	PRACTICAL
1	TW	Introduction to MPLP & Study - Observation & Measurement		Use of microscopes
2	TW	Observation & Measurement cont. - The SI System		Counting erythrocytes
3	TW	Variation & certainty in measurements	What is science?	
4	TW	Variation & certainty in measurements	What is science, cont.	
5	TW	Variation & certainty in measurements	Scientific papers & report writing	
6	TW	READING WEEK		
7	TW	Biological essentials: Unity & Diversity	Video "Introduction to Living Cells"	
8	TW	Cell cycles		Haemoglobin - lab investigation
9	TW	Cell Division, Mitosis & Meiosis		Haemogobin - assay
10	TW	Mitosis & Meiosis cont. DNA, The Genetic Code	Video: "The genetic code"	
11	TW	The Genetic Code & Proteins	Video: "DNA Replication & Mitosis"	
12	TW	Proteins	Video: "The Genetic engineering of Proteins" - Insulin	
13				
14	DH	Nomenclature & Classification		
15	DH	A brief guide to Animal Diversity		
16	DH	Microscopy - a historical preview		
17	DH	Microscopy - a historical overview		
18				
19	AE	The concept of Energy. Conversion & Transport	Calculations on energy	
20	AE	Case Study 1: Formation of the Sun	Concepts in Physics: Temperature, Gas Law, etc.	
21	AE	Case Study 1: The sun in its steady state	Mathcad exercise: Black body radiation	
22	AE	Case Study 2: Energy in the Atmosphere	Feedback. Calculations	
23	AE	Case Study 3: Energy in Plants	Case Study 4: Energy in the human body	

MPLP1
Physical Sciences Segment

Week	Lecture	Seminar
1	The Physics of Sex - An Overview	Overview of Physical Concepts to be Covered
2	Long Distance Attraction - From Man to Molecules	The Nature of Electricity (Weinberg 1-25)
3	Sex in Space - The Rocket Launch of the Sperm and the Conservation of Momentum	Newton's Laws of Motion (Weinberg 25-33)
4	Electrical Barriers to the Progress of the Sperm	Electric Forces (Weinberg 33-43)
5	The Sperm as a Swimmer and Surfer - Waves and Wave Motion	Magnetic Forces (Weinberg 43-53)
6	The Sperm as Physicist - The Journey in Terms of Energy	Energy (Weinberg 53-66)
7	Review	Review of Concepts

WEEK	LEC	LECTURE	SEMINAR	WORKSHOP
1	MD	Exploration & Exploitation in the 17th & 18th Centuries.	Skills workshop: How to approach a text.	
2	MD	Lock & the European Enlightenment	What is the Englightenment & who was in it?	
3	MD	The enlightenment & science of Capitalism; the birth of Laissez-faire	Vollaire's Micromegas & Candide	
4	MJ	Religeon, Literature & Science	Lawrence Stem's Tristram Shandy, Johnathan Swift's Gulliver's Travels.	
5	MD	The Political Implications of the Enlightenment, Part One: Liberty & Equality	Timeline of the French Revolution	
6		READING WEEK		
7	MD	The Political Implications of the Englightenment, Part Two: Fraternity	The early Industrial Revolution: Economic growth & culture.	
8	MD	The Industrial Revolution & its Human Consequences	Benthamism: A force for efficiency or dehumanization.	
9		The rise of the Expert : Utilitarianism & Social Control/Owen & Bentham	Pre-Marxian socialist "utopian" thinkers.	
10	MD	Religeon versus Rationalism?	The Great Cat Massacre.	
11	MD	Urbanization	The Romantic's Response to Industrialisation.	
12	MJ	The Romantic Response to Industrialisation	1740-1830: Religeous enthusiasm or Religious tolerance?	
13	MJ	Liberal Critics of American Industrial Culture: Thoreau, an early Green?	The Enlightenment and Women	
14	MJ	Liberal Critics of Victorian Society: Ruskin, Arnold & Dickens	Nature, Society & Politics	
15	MJ	Women, science and literature	Liberal Critics of Victorian Society	
16	MD	Romanticism, nationalism and anit-semitism	Stanton, Truth & Allies	
17	MD	Darwinism and Positivism	Marx & Engels' Scientific Socialism	
18	MD	Marx & Engels: a scientific socialism?	Science & Religeon: Tennyson & Hardy	
19	MJ	Literary Appropriations of Darwinian Thought	Darwinian & Social Darwinism	
20	MJ	Race and Empire	Literary appropriations of Darwinian thought	
21		Science Fiction & Social Criticism: Bellamy & Morris	Melville's Type, SJ Gould's Mismeasure of Man	
22			Conrad's Heart of Darkness	
23			Bellamy & Morris - Two Utopias	
24			William Morris	
25				

WEEK	LEC	LECTURE	SEMINAR	PRACTICAL
1	NW	The Birth of Experimental Botany: Experimental techniques & the life sciences. Sex in plants. Rudolf Camerer & Stephen Hales.	The origins & domestication of crop plants	
2	NW	Plant Classification in the 18th Century. John Ray, Linnaeus, the de Jussieus.	Video: Science in 18th Century Sweden	
3	NW	The Exploitation of Plant Products and the Vision of a World Flora		Morphology of crop plants
4	NW	The Exploitation of Plant Products and the Vision of a World Flora cont.	How do plants synthesize chemicals' compounds?	
5	DH	The fundamental Laws of Inheritance. Mendel.		Individuality
6	DH	The development of the cell concept. Brown. Dutrochet. Schwann.	Original papers by Brown, Dutrochet, Schwann	
7		READING WEEK		
8	DH	Preformation & recapitulation.	Cell organelle analogies	
9	DH	Evolution. Especially the 19th debate surrounding the evolution of Homo sapiens. Darwin, Huxley, Wallace, Wilberforce.	"Lucy" video (Johanson)	
10	TW	Empirical 18th & 19th Century health movements. Early theories of disease	Reading from Primary Materials	
11	TW	Organism theories of Disease - Infectious agents	Reading from Primary Materials	
12	TW	Theories of Immunity in the 18th & 19th Centuries	Reading from Primary Materials	
13	LF	Heat as a fluid - the story to Rumford	Setting up a developmental spreadhseet	
14	LF	Heat as motion - from Rumford on	Setting up a developmental spreadsheet with further detail	
15	LF	Technology - The development of heat engines in the 19th Century		Heat & Work - the Stirling engine
16	LF	Development of ideas of heat - the cultural context	Analysis of the spreadsheet	
17				
18				
19		READING WEEK		
20	FM	Electricity as communication: The electric fluid. Stephen Gray - qualitative prop's of electrostatics		
21	FM	Storing electricity: The Leyden jar (Musschenbroech, 1745). Franklin - lightning conductors, Anglo-American tensions.		
22	FM	The Newtonian metaphor & the mathematisation of electricity: Aepinus, Coulomb, Priestley, Cavendish - laws of electrostatics.		
23	FM	Electricity as a life force: Current electricity, Galvani - Physiology, animal electricity, Volta (1800), Davy.		
24	FM	Unification: Electromagentism, Oersted, Ampere, Electricity as entertainment, Faraday & Henry, Romantic tradition & unification.		
25	FM	Abstraction: Electromagnetic fields. Maxwell - vector potentials, mathematical representation (1864), vortex tubes (idler wheels 1861-2_.		
26	FM	Electricity as communication (again): Electromagnetic waves. Hertz (1888). Radio. The ether - attempts to retain a mechanical view.		

SCIENCE JOURNALISM

WEEK	LEC	LECTURE	SEMINAR	WORKSHOP
1	PB/FM	Introduction - news? what news?		
2	PB/FM	English exercise - editorial session 1		
3	PB	Use of language - editorial session 2		
4	PB	Feedback on English exercise		
5	PB	News values & news ethics		
6		STUDY WEEK		
7	FM	How to construct a story 1		
8	FM	How to construct a story 2		
9	FM		TUTORIALS	
10	FM	How to construct a story 3		
11		CONFERENCE - NO LECTURE OR SEMINARS		
12	PB	Other genres?		
13	PB/FM	Exploratory trip		
14	PB/FM	Popular Science		
15	FM	Popular Science		
16		INTERSEMESTER WEEK		
17	FM	Presentation		
18	PB	Audience 1		
19	PB	Audience 2		
20	PB		TUTORIALS	
21	CPAL	Case Study		
22	CPAL	Case Study		
23	CPAL	Case Study		
24	CPAL	Case Study		
25	CPAL	Case Study		

RECEPTION OF SCIENCE SUBJECTS

WEEK	LEC	LECTURE	SEMINAR	WORKSHOPS
1	NLE	Introduction to course	Discussion of assessments	
2	NLE	Royal Society Report on the Public Understanding of Science	The importance of research problems	
3	NLE	NO LECTURE: Union Meetings	NO SEMINARS : Union Meetings	
4	NLE	Case Study 1: Evans & Durant, Understanding Science in GB/USA	About research methodologies	
5	NLE	Media Audience Research	About "objectivity"	
6	NLE	READING WEEK		
7	NLE	Film on Kogi Indians	Film on Kogi Indians	
8	NLE	Introduction to Hermeneutics/Ethnography	Kogi metaphors and symbols	
9	NLE	Hermeneutics/ethnography of modern culture	What does the ethnographer do? An example	
10	NLE	Hermeneutic approach to the Communication of Science	Metaphors in everyday life	
11	NLE	Structuring a hermeneutic approach to Communication of Science	Analysis of metaphors in a popular science piece on time machines	
12	NLE	The stages in your own research projects	Decide groups and research topics	
13	NLE	Case study on Nuclear Energy (Introduction)	Selecting interviewees for research	
14	NLE	Case study on Nuclear Energy (Media Representation)	Structuring interview sessions	
15	NLE	Case Study on Nuclear Energy (Media Representations)	Developing interview questions	
16	NLE	Case Study on Nuclear Energy (Audience Research)	Practice interview techniques	
17	NLE	READING WEEK		
18	NLE	Case Study on Star Trek (Introduction)	Analysing responses of audiences	
19	NLE	Case Study on Star Trek (View episode)	Analysing responses of audiences	
20	NLE	Case Study on Star Trek (Analyse episode)	Meetings to discuss final projects	
21	NLE	Case Study on Star Trek (Ways of doing audience research)	Meetings to discuss final projects	
22	NLE	Case Study on Star Trek (The Fandom Phenomenon)	Meeting to discuss final projects	
23	NLE	Concluding lecture: implications of course for prospective producers	Textual analysis of Star Trek	
24	NLE	BANK HOLIDAY	BANK HDLIDAY	
25	NLE	Lecture time devoted to Q & A about final projects	Seminars devoted to Q & A about final projects	

SCIENTIFIC ANALYSIS OF ENVIRONMENTAL ISSUES

WEEK	LEC	LECTURE	SEMINAR	PRACTICAL
1	MAJ	Introduction to the module and the issue of sustained development	12 Days to save the world	
2	AE	Overview of nuclear power	Identification of issues	
3	AE	Processes in reactor core	Discussion of specific issues	
4	AE	Processes in reactor core	Computational class	
5	AE	The nuclear station: design & construction	Computational class	
6		READING WEEK		
7	AE	Reprocessing & waste disposal	Discussion of issues around reprecessing	
8	AE	Chernobyl	Issues on Chernobyl	
9	AE	Risk assessment	Discussion of risk assessment	
10	KAL	Introduction to acid rain	How acid is acid rain?	
11	KAL	Chemistry of acid rain	Lies, damn lies and statistics	
12	KAL	Surface water acidification	Modelling acid rain	
13	KAL	Air pollution & tree health	Tree survey workshop	
14	KAL	Other issues	Acid rain video	
15	KAL	Development of air pollution policy	Discussion of issues	
16		READING WEEK		
17	KAL	Electricity privatisation &acid rain	Discussion of issues	
18	KAL	Review of acid rain as a scientific, economic & cultural phenomenon	Discussion of issues	
19	MAJ	Introduction to sustainability	Perception of sustainability	
20	MAJ	History & origins of sustainable development	Local problems & local people	
21	MAJ	Quantifying sustainability	Incentives for sustainability	
22		Self-study		
23	MAJ	Sustainable Development: The UK strategy	Consumer patterns	
24	MAJ	Rationale for sustainable forestry	Forestry principles & incentives	
25	MAJ	Beyond Rio	Issues of local sustainability	
26		Issues Panel (HR, MAJ, AE, KAL)		

MPLP2
Physical Sciences Segment

Week	Lecture	Seminar
1	Review of Concepts from MPLP1 - The Physics of Sex	Review of Concepts from Weinberg
2	Atoms in Nature - The Fate of Caesar's Last Breath	The Periodic Table
3	Atoms in Nature - Where do Exhaust Fumes Go?	The Periodic Table (ctd) (practical)
4	Atoms in Nature - The Radon Story	Radioactivity (practical?)
5	Molecules - Symmetry and Beauty	Symmetry
6	Chemicals - Good or Bad?	SCL Assignment
7	Chemistry in the Kitchen	Cooking!
8	Chemistry in the Laundry	Course Summary

DSCCIIIH

WEEK	LEC	LECTURE	SEMINAR	WORKSHOPS
1		Introduction to the Twentieth Century I: Pete Broks		
2		Introduction to the Twentieth Century II: Pete Broks		
3		Introduction to Modernism & the City	The City of Dreadful Night: Eliot's "Rhapsody on a Winter's Night (handout)	
4		Rationality, City & System: Modernist Poetry (handouts)		
5		Ghosts in the Machine: Metropolis & Alienation	Eliot's "The Waste Land"	
6		Fordism and "Scientific Management" of People	Huxley's "A Brave New World"	
7		Technology & Utopia	Huxley's "A Brave New World"	
8		Technology & "Art": Resistance and Fascination	Futurism, poetry and painting (handouts)	
9		Technology & Writing: City of Words	Modernist poetry (handout) Joyce's "Ulysses"	
10		Modernist Fiction & Relativity	Joyce's "Ulysses". Extracts from "Finnegan's Wake" (handouts)	

DSCCIIIS

WEEK	LEC	LECTURE	SEMINAR	PRACTICAL
1	FM	Special Relativity: Cracks in turn-of-the-century physics (pre 1905)	Frames of reference calculation	
2	FM	Special Relativity: "On the electrodynamics of moving bodies" (1905)	The garage paradox	
3	FM	Special Relativity: The reception of relativity (post 1905)	Two relativity texts - Einstein's 1905 paper & the 1919 Times report of Eddington's expedition	
4	CP	Quantum Theory: The pillars of classical certainty (1890s)		
5	CP	Quantum Theory: More cracks in turn-of-the-century physics (1900s)		
6		READING WEEK	NO SEMINARS	NO PRACTICALS
7	CP	Quantum Theory: Saving appearances (1900s)		
8	CP	Quantum Theory: Einstein and de Broglie's conviction (1900-1920)		
9	CP	Quantum Theory: A blurred picture begins to emerge (1920-1935)		
10	CP	Quantum Theory: Copenhagen interprets (1920-1935)		
11	FM	Particle Physics: The successes of the English tradition	Relativistic calculations with sub-atomic particles	
12	FM	Particle Physics: Ever-multiplying particles	Laboratory analysis of bubble chamber photographs	
13	TW	Discovery of Mendel's laws (1900)		
14	VS	Continuous versus discontinuous inheritance		
15	TW	Population genetics		
16		READING WEEK	NO SEMINARS	NO PRACTICALS
17	VS	"Inborn errors of metabolism" and "polygenic" diseases		
18	TW	Eugenics		
19	VS	Molecular genetics - recombinant DNA technology		
20	NW	Reductionism in biology versus "macro" biology		
21	NW	The emergence of ecology		
22	NW	Plant breeding, population genetics, genetic manipulation of plants		
23	NW	Photosynthesis & Energy Capture		Isolation of Chloroplasts
24	DH	Origins of life	Life is impossible - Video	
25	DH	Homeostasis: the reproductive cycle & in vitro fertilization	Spontaneous generation & evolution of life video	

Science, Technology and Society
Year 3 Science Option

It is difficult to break this course down into a weekly "lecture/seminar" format". The course consists of **three case studies: The Manhattan Project, Cancer, and The Human Genome Project.** Each occupies about seven weeks. Within each segment we cover:

1) The Underlying Science This is taught in terms of its historical development. In all cases, there are the questions of how the scientific directions are and could be chosen/directed/controlled. Students are brought face to face with decisions ranging from the financial to the moral. They are also frequently reminded that this is a science module and that they are expected to have a good grasp of the actual science.

2) The Sociological Issues Students are introduced to a standard sociological approach for analysing the interactions between scientists and society, and are asked to consider whether this approach is useful in analysing the case studies.

3) Media Presentations of the Issues Two or three videos and a selection of newspapers, books and articles are presented for analysis during each segment of the course. Students are urged to import approaches from other parts of their degree course as well as considering the sociology portrayed or revealed.

4) Ethical Issues These are a constant theme, referred to in lectures but primarily covered during seminars.

Seminar periods are devoted to the preparation of an on-going **analytical notebook** in which students record their analyses of issues and concepts arising during the course. This is specifically a seminar activity. A seminar may, for example, consist of a discussion of (say) gene therapy, based on an article provided in advance or a video seen at the time. Notes taken by the students during discussion are worked up and extended, for which ample class time is allowed.

Appendix V

Description of SCC in University Prospectus

The following page reproduces the description provided in the University course prospectus for the SCC degree. Like the course leaflet (cf. Appendix VII), it is significant that the very first statement about the degree describes it in terms of the model of 'effective science communication'. Several first-year students noted that this description was misleading inasmuch as it suggested that the purpose of the SCC degree was to form science communicators. It is also a matter of some interest that this document suggests that the course is "highly integrated".

BA(Hons) SCC

Admissions Tutors:
UCAS Code:

Introduction

In recent years there has been increased demand for graduates who understand science and can present it effectively and imaginatively. This new degree is designed to meet that demand by combining rigorous scientific practice with cultural analysis, media techniques and the exploration of scientific issues.

The forging of a new partnership between staff in the faculties of Sciences and Humanities has resulted in a highly integrated programme employing innovative teaching methods.

This three year full-time degree should be particularly attractive and accessible to students with a mixed science/humanities background. However, it is designed to cater sensitively for students with no formal qualifications in science.

Programme Content

The programme weaves together four related themes.

How Science Developed: the way the philosophy and approaches of science have been shaped, pushed and limited by the society which produced it.

Communication and the Media: introduces you to media techniques (eg script writing, front-of-camera presentation, desk top publishing) and methods of media analysis.

Issues of Current Concern: examines issues like global warming, cancer treatments, and food safety. The science involved will be explored as will the cultural and social considerations that envelop them.

Integrated Science: underpins the science needed in the other areas of the programme of study enabling you to evaluate scientific data and make links between theories and experiments.

There are six modules in each year.

Year 1

Development of Science in a Cultural Context (DSCC) I (two modules), Communicating Science, Investigating the Science in Contemporary Issues, Matter, Physical and Life Processes (MPLP) I, Computing, Numerical and Graphical Methods.

Year 2

DSCC II (two modules), Scientific Analysis of Environmental Issues, Science Journalism, The Reception of Science, MPLP II.

Year 3

DSCC III (two modules), Independent Project (two modules), Science Option, Humanities Option.

Assessment

Assessment includes coursework, examinations, open book examinations, conference presentations, extended essays and projects. The final degree classification is based on the marks achieved in the second and third years.

Careers

The public understanding of science provides a wide range of opportunities for scientifically literate communicators, for example broadcasting, science journalism and public relations, as well as science teaching, science librarianship or scientific publishing.

Entry Requirements

Please see the entry requirements chart on page 47.

Further Information

If you would like to know more about this award, please contact the Admissions Office, telephone .

Appendix VI

Description of SCC in Science Foundation's Newsletter

The following pages contain an article about the SCC degree which was written by one of the lecturers of the Faculty of Science for a science foundation's newsletter. Both the name of the author, and the name of the newsletter have been removed to protect the identity of the university.

Degree with a difference

A new degree at the University is attempting to teach science by locating it in a broader cultural landscape. A key element in this project is the development of a critical understanding of the communication of science. who is a lecturer on the course reports on its progress.

The incessant skirmishes fought out across the cultural divide always lead to the same charges being made: scientists are illiterate, inarticulate and culturally unwashed; non-scientists are wholly ignorant of the dominant body of knowledge of the modern era and are unappreciative of the richness of science. Such statements are rarely constructive, but they do contain an element of truth. Science clearly influences, and it is typically regarded as something alien to the rest of culture, something of little interest to the lay public and poorly understood by them.

The situation is exacerbated by an education system which demands commitment to *either* the sciences *or* the arts. There are few learning opportunities which accommodate both traditions at once. Whilst science degrees concentrate on the detailed content of one scientific specialism, humanities degrees largely exclude science from their treatment of contemporary culture or intellectual history.

Schizophrenia

Some attempts have been made to counter this educational schizophrenia by offering humanities options to science students and 'science for poets' courses to humanities students. But this 'bolt-on' approach, although helpful in some respects, can never adequately bring the sciences and the arts together. Although attempting to address the problems generated by the two cultures, this approach implicitly starts from the assumptions of that mentality: the two cultures are wholly separate and whilst a mutual exposure might encourage mutual tolerance, learning in the arts will not inform the way we view science or vice versa.

Discipline equality

An alternative approach is to consider both humanities and science equally. By recognizing that the one can inform the other on the interplay between the two, it is perhaps possible to arrive at a new way of viewing science which is more fruitful than the approaches based on the assumptions of the old two cultures


Fast Forward

PAUSE FOR THOUGHT

Newsletter of the

debate. This is the aim of the degree at the University

The core idea at the heart of the degree is that the science we teach should be represented in a culturally meaningful way - it should not be divorced from its historical, social or philosophical contexts. The importance of contextualization means that the course is taught jointly by members of the Faculty of

Hunanities and the Faculty of Sciences, and the students attend lectures on, for instance, history and literary studies as well as biology and physics. For the course to be effective, any of these lectures must constantly refer to what the students are learning in any of their other lectures. Strong links between the two faculties make this possible.

Cultural dimensions

A particularly important example of the interplay of science with the rest of culture is the communication of science. Here, science is quite explicitly recognized for its cultural dimensions and yet the ways in which science is represented to the general public are rarely analyzed in the same way that, for instance, the construction of political news might be. On the degree, the methods of cultural and media studies are applied to popular representations of science in order to develop the ability to analyze science communication critically. Integral to this project is the opportunity for the students to practise popularizing science for themselves. By gaining first-hand experience of the restrictions and potentials of the various media, the students learn how these affect what the public are told about science.

Practical work is therefore a key component of the course. This is as true of the science the students learn as it is of media studies. While undergraduates in their first year might be busy practising their front-of camera skills, or the second-years could be interviewing a local scientist in order to write a news feature about their research, the third years might be in a laboratory extracting DNA and running a gene sequence. This practical work is able both to reinforce and to expand the more academic aspects of the degree.

From the different types of knowledge they acquire and the variety of methods they encounter (scientific and humanities-based, practical and academic), the students should be able to synthesize a new way of conceptualizing science. They should develop a view which is not simply the view of the scientist, nor the historian, nor the media expert, but is something more than any of these. It will be a view which derives from exposure to some of the technicalities of science, but which facilitates the analysis of these details in a reflective way. Out of a fully contextualized science, the critiquing of science and its communication should become natural.

Communication difficulties

The degree is still in its early days, the first students will graduate this summer. Inevitably for an innovative and non-standard course, it had its problems. Ironically enough for a course so concerned with communication, one of the main difficulties is communication. Getting across to sixth-formers what the degree is all about, ensuring that all the applicants have accurately grasped the ethos of the course, is not an easy task. Prospective students can be seduced by the word 'media' into mistaking this for a skills-based, vocational course.

However, problems such as these will no doubt be overcome as the degree becomes more established. A highly committed and enthusiastic teaching team, encouraged by strong support from outside the university, makes the hopes behind realizable. Perhaps our first graduates will be able to start building that much-needed bridge across the cultural divide.

Lecturer in Science in Context

Appendix VII

SCC Course Leaflet

The following pages contain a reproduction of the SCC course leaflet provided to prospective students. This leaflet reproduces the orientation to work which I analysed in chapter two by highlighting the role of the SCC degree in forming science communicators. This leaflet also mentions the 'integrated' nature of the degree.

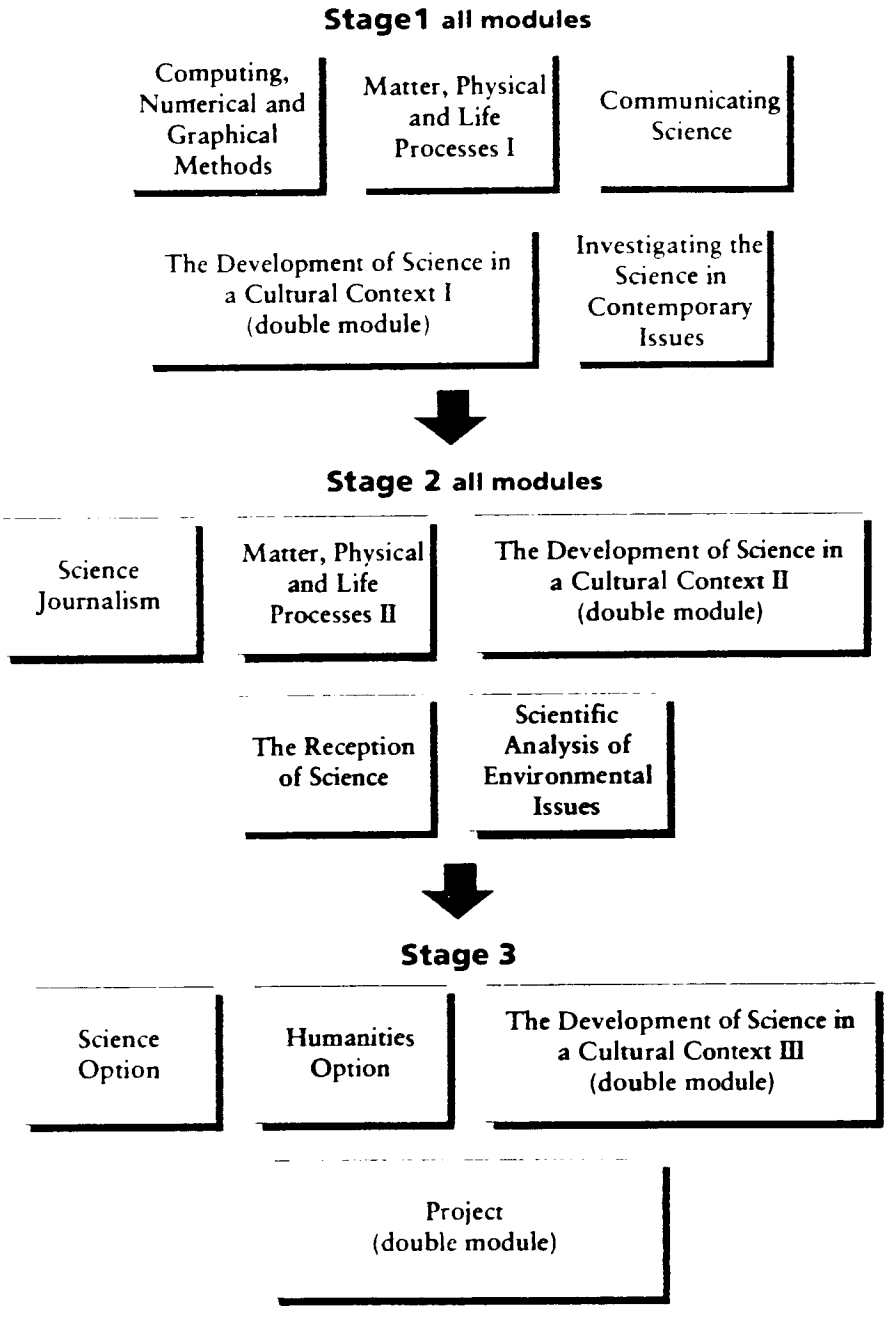
BA (Hons) SCC
(Optional Sandwich) Y110

Award Leader - Telephone
- Admissions Tutor - Telephone

Employment Prospects
Although this degree should be regarded as academic rather than vocational, the Communication of Science theme does provide opportunities of employment in addition to that afforded by a conventional BA. Graduates could expect to be able to compete for employment in any area where the communication of science is important - for example, science journalism, science publishing, hands-on science centres, museums, etc. Science librarianship and teaching are also possible careers which can be pursued through post-graduate courses.

The Award
The Programme leading to the award BA(Hons)
is a fully integrated course of study which examines science using four different themes. The History of Science theme looks at the development of science by examining the two-way links between the science and the cultures out of which it developed. The Communication of Science theme studies how science can be communicated and how the media treat science as well as teaching communication techniques such as desk-top publishing, video editing, in-front-of-camera work, etc. The Issues theme looks at how science fits into a modern developed society and finally, the Science theme examines science - what it is, how it works as well as teaching necessary scientific knowledge and skills necessary for the rest of the programme.

Structure
Although the programme is modular, it fully integrates the themes mentioned above throughout the modules. The structure shown therefore only reflects the emphasis of the modules, each of which normally covers more than one theme. Assessment is mainly through coursework, but open-book and seen examinations are used in most modules


Stage1 all modules
Computing, Numerical and Graphical Methods
Matter, Physical and Life Processes I
Communicating Science
The Development of Science in a Cultural Context I (double module)
Investigating the Science in Contemporary Issues
Stage 2 all modules
Science Journalism
Matter, Physical and Life Processes II
The Development of Science in a Cultural Context II (double module)
The Reception of Science
Scientific Analysis of Environmental Issues
Stage 3
Science Option
Humanities Option
The Development of Science in a Cultural Context III (double module)
Project (double module)

Final Year

In the final year students have the opportunity to pursue more specialist areas of interest through the choice of options and a project. Science options offered will reflect the range of areas studied physical, biological, environmental) as will the Humanities options (Literature, Cultural Studies, History, Environmental studies). The possible project titles can also reflect the student's interests.

Related Postgraduate Study

PGCE in science teaching

Postgraduate Diploma in Librarianship

Various Science and Humanities based MSc and MA courses which do not require specific first degree entry requirements.

Entry Requirements

One of the following:

- GCSE grade C or above in Five subjects which must include English Language and Mathematics. Two GCE A-levels, or one A-level and two AS-levels
- A BTEC National Level Diploma or Certificate with merits in at least four subjects
- An appropriate pass in an 'Access' course
- Applications from mature students are welcome, and will be examined individually.

How to Apply

Applicants should apply through PCAS for entry to Year 1 in 1993 quoting PCAS No. , the University's code is . or through UCAS for entry to Year 1 in 1994 quoting UCAS , the University's code is .

The University, and the Faculty of Sciences

This is an interdisciplinary award, taught in the Faculty of ' - Sciences which consists of the Department of Biological Sciences and the Department of Chemistry and Physical Sciences. There are over 60 academic staff and about 600 full-time and sandwich students in the Faculty which offers a range of BSc and BA Awards, some in association with other faculties. The University's prospectus provides further information.

For Further Information

Contact the Admissions Office:
elephone
Minicom

Appendix VIII

Examples of Combined Courses in Media Studies

The following pages contain two examples of curricula structured along the lines of the combined modality in media studies. The examples are meant to illustrate the extent to which 'theory' and 'practice' modules are strongly classified and framed in this modality. I have removed the names of the courses to protect the identities of their practitioners and institutions.

MEDIA STUDIES UNIVERSITY
Subject Area Leader: M N

Subject Description

The media are an increasingly important part of the modern world. The Media Studies subject area will look at magazines, advertising, music promos, independent and community production as well as the more traditional areas of study such as broadcasting, the cinema and the press. Students will be expected to develop a critical understanding of cultural, social, technological and political factors in the development of the media. They will also examine the production of meaning, narrative structure, debates about audience and the creative as well as the theoretical implications of innovations in media forms.

Media Studies is available as a specialist, major, joint and minor degree. All students intending to qualify for a named degree must complete the core programme (consisting of those units marked * below). The additional units required for the different degrees will be selected from a range of approved optional units offered by the Media Studies subject area and other related areas such as Cultural Studies, History of Art, Design and Film, Innovation Studies, Women's Studies, Third World Studies, Psychosocial Studies, History, Literature, and Popular Culture. Examples are listed below.

Media Studies as a specialist degree includes compulsory production units at each level. In the first year students will sample all production areas. For the next two years they will specialise in one of three options: video, sound/radio, or print/graphics (mainly using the Apple Mac). Students must specify their preferred production option when they apply to the course. The practice:theory ratio over the three years will be approximately 1:3. Units marked # below are offered only to specialist degree students.

The programme area as a whole provides a suitable foundation for students who wish to work in the media or associated industries as practitioners, researchers or administrators or in media education. It does not provide a vocational qualification.

Modes of Assessment

Assessment modes have been designed to test a wide range of skills and abilities. Assessed work will include essays, exams, seminar presentations, group work, textual readings, research reports and for specialist, major and joint degree students, a project (which will normally be in the form of a written dissertation but can also include other forms such as scripts or interviews). For students doing the specialist degree, pre-production, production and post-production exercises which test research, organisational, collaborative, creative and communication skills are also included.

Entry Requirements

In order to be accepted on to the specialist, major or joint degree programmes, applicants will be expected to show potential, motivation, organizational skills and a developed interest in the media. They will normally be expected to obtain two A levels at C grade or equivalent Access, BTEC and NV qualifications in appropriate subjects. Mature unqualified applicants will be considered if they are able to demonstrate their suitability according to the criteria above.

Media Studies is a very popular subject area so an additional tier has been introduced into the selection process in order to cope with the high number of applications. On the basis of their UCAS forms some candidates will be asked to complete a short questionnaire designed to explore their interests, experience, analytical ability and - in the case of specialist students - their production ideas and preferred production option. Selected students will then be invited for interview where they may show examples of media work if they wish. Previous experience will be considered an asset but not a requirement for students wishing to be accepted onto the specialist degree.

First Year Units

1)*MED 101 **Media Meanings** (Introduces critical approaches to media forms, texts, meanings and institutions largely through practical exercises)
2)*MED 102 **The Rise of the Mass Media** (Examines the development of forms (eg cinema, advertising, magazines and broadcasting) their cultural significance for audiences and key debates about mass culture during the twentieth century)
3/4)#MED 103/4 **Media Production I** (Students do an introductory half-unit in each of the following production areas: video; sound/radio; print/graphics; tape-slide)
5) NTM 101 **Media Technology and Social Change** (Looks at the relationship between technology and socio-political change focusing on the film and recording industries)
6) **Elective Unit** (Free choice from any available unit in the university; students may wish to choose from the list of recommended complementary units which include eg Culture, History Power, Introduction to Information Technology, Women and the Visual Arts)

Second Year Units

1)*MED 201 **Media, Culture and Identity** (Explores further the media/reality relation, the national role of the media and debates about representation, gender and sexuality)
2)*MED 202 **Media Technologies and Organisations** (Examines the political, economic, technical and institutional history of the print, radio and video industries)
3)#MED 203 **Media Production II** (Students work in groups and produce a news item and an advertisement in their selected option - either video, sound/radio or print/graphics)
4)#MED 204 **Working in the Media Industries** (Studies industry practice through location observation and visiting speakers)
5) **Approved Option** (Free selection from approved list of about ten options including Consumption and Consumer Behaviour, History and Theory of Film, Newspaper Production in Britain)
6) **Elective Unit** (Free choice from any available unit in the university; students may wish to choose from the list of recommended complementary units which include eg Forms of Fiction, Psychoanalysis and Semiotics, Culture, Identity and Development in Latin America)

Third Year Units

1)*MED 301/2 **Media Project** (Self-directed unit available to specialist, major and joint degree students only; can be taken either as a single or as a double linked unit)
3)#MED 303 **Media Production III** (Higher level production exercises in selected production areas include documentary and experimental work)
4)*MED 304 **Media in Transition: an International Perspective** (Examines the internationalisation of media and communication systems, the media in the Third World and postmodernism)
5) **Approved Option** (Free selection from approved list of about fifteen options including Television and Cultural Change, Popular Music, Films/Feminisms, Indian Cinema since Independence, Advertising in Context)
6) **Elective Unit** (Free choice from any available unit in the university; students may wish to choose from the list of recommended complementary units which include eg Constructions of Race in Britain, Gay and Lesbian Cultures, Cultural Change in the Late Twentieth Century)

Public Media

For Codes and Course Codes see individual Academic Course entries.

The Public Media course is designed to introduce the student to a wide range of communication topics whilst allowing scope for specialisation in a number of professional areas such as broadcasting, the print media, marketing, public relations and advertising. By focusing on current issues such as satellite broadcasting, the freedom of the press and advertising standards the course will allow students to consider the implications of recent trends and established theories of communication. In addition, a study of communication in an organisational context is developed in order to equip students with the knowledge and skills required to understand and function within the increasingly complex media world. While the degree is not intended as a substitute for specific vocational training (such qualifications are better obtained after graduation) it does provide an education which is directly relevant to a number of potential career paths.

Year 1

Theoretical Core I

The core introduces students to the main aspects of Public Media.

(a) *Public Media*
Definition of Public Media; 'Mass' and 'Public' in media; The public interest; Current and future media trends.

(b) *Topical Media Issues*
A study of specific topical examples of the impact of contemporary issues and new technology within the context of marketing, advertising, public relations and journalism.

(c) *Political Communication*
The rationale and practice of a free press within modern society: access, accountability, international aspects, state and society.

(d) *Techniques and Issues of Systematic Observation*
Communication analysis; Sociograms; Organisational design; Communication audit; communication theory.

Media Studio I

The unit aims to initiate and develop a range of basic media skills for all Public Media students. These will include:

(a) Sound recording.
(b) Tape editing.
(c) Production for radio.
(d) Black and white 35mm photography.
(e) Photographic developing and printing.

Computing

(a) Introduction to computing, BASIC programming
(b) Wordprocessing
(c) Database basics
(d) Spreadsheets
(e) Control Applications

Year 1 Examination

(a) A three-hour written examination on Theoretical Core I.
(b) A project report of 4,000 words on Media Studio I.
(c) A two-hour written examination on Computing.
(d) A report of 2,000 words on the student's Year 1 attachment.

Year 2

Theoretical Core II

The theoretical core provides a framework for the study of communication in society.

(a) *Communication Process*
The concept of process; relationships of process to intrapersonal and interpersonal communication; Communication models, descriptive and prescriptive. Communication interfaces.

(b) *Organisations and Organisational Communication*
Relationships between organisational theory and aspects of communication theory; nature and function of communication in organisations, analysis of formal and informal communication; implications of the organisational structure for communication flows; organisations and individuality.

(c) *Interactions*
Use of information to produce organisational outputs; coordination of activities—decision-making, problem-solving and leadership; implementation of systems to meet these needs.

(d) *Information and Technology*
The factors underlying technological change, barriers to innovation and change in organisations; recent technological developments and their impact on organisations and society, information and control systems, determinism-voluntarism debate.

(e) *Culture and Knowledge*
The construction and use of knowledge in organisations, valid knowledge and professionalism, examined within the context of organisational theory and epistemology, the use of ideas to validate and legitimise structure and process, the tactical use of information

Radio Broadcasting

The development of radio broadcasting.
Existing arrangements in the UK and elsewhere.
Working routines and arrangements of radio stations, with particular reference to local stations.
Comparison of BBC and Independent local radio stations.
Programming philosophies, obligations and constraints.
Audiences.
Contemporary developments: proliferation of local radio, regionalisation, the effect of cable and video on radio.

The second Professional Attachment is undertaken during the first six weeks of Year 2 Semester 2 after which the student will submit, as part of the Year 2 Examination, a communications analysis.

Year 2 Examination

(a) A three-hour written examination, based on a case study published one week before the date of the examination, and an extended essay of 4,000 words, on Theoretical Core II;
(b) A three-hour written examination paper on each of the two options selected by the student;
(c) A communication analysis of about 3,000 words, based on the Year 2 attachment.

Year 3

The studies will consist of the following units:

Theoretical Core III

(a) *Media Practice and Organisation*
Organisation of the British media: print, broadcasting and film; the international profile of the media—key features of the global picture; organisational routines and their relationship to professionalism and the final product; the relationship of media organisations to the state and how this affects their way of working; the nature, extent and consequences of inter-institutional links within the media field, audience research as carried out by media industries. The uses to which this is put and what insights this may give into the relationship(s) between the media and the audience; the genesis, nature and likely consequences of technological change for the media; accountability in the media as a practical and ethical question, the possibility of 'access' media and issues raised by this.

(b) *Media—Theory and Methodology*
Epistemology and the possibility of objective knowledge; problems engendered by the existence of incommensurable modes of media research; issues of truth and validity in relation to the possibility of 'balanced' media; political philosophy on the role of the media in society; ideology—an exploration of the concept in relation to what the media do; censorship—a consideration of the legal, ethical and political grounds on which sexually explicit, violent and politically sensitive material is defined as such and subjected to censorship, the issues raised by these practices, language as a tool for media in the definition of their realities.

Options

Students will choose one option from Group C and one from Group D, not all options will necessarily be available in any one year.

Group C

Audience Study

'Audience' as a problematic concept.
General methodological problems in theorising the audience.
An historical overview of the rise of the audience.
Conceptions of the audience: as aggregate; as mass; as public; as a market.
Relationships between these characterisations, theory choice, and understandings of the larger society.
The problems and possibilities of regarding an audience as a social phenomenon.
'Active' versus 'passive' conceptions of the audience.
The audience—sender relationship: evidence; theories; implications.

Contemporary Issues in Communications

Images of organisations/institutions in the media, such as the police.
The marketing of pre-election politics through the media.
The role of motivation in marketing and advertising.
Marketing influence on the translation of a novel into a film.
Gender imagery and feminism.
The role and operation of community newspapers.

Decision Making and Communication

A review of the decision making literature. An examination of the process of decision making in organisations/institutions.
Analysis of some basic models of decision making.
Decision making and communication; decision making and power.
Organisations for study may include a newspaper, a radio station, a theatre or a tourist agency.

Marketing Communications

Analysis of theories of marketing communications: advertising, sales promotion, PR/publicity, personal selling.
Interrelationships of communications components within overall marketing mix policies and strategies.
Campaign planning with emphasis on objectives, alternative strategies, budgets, evaluation.
Organisations and structures concerned with marketing communication.
Role of communication in social marketing and non-profit organisations.

Public Relations Strategy
Introduction to corporate public relations.
Corporate identity: rationale and development.
Corporate image measurement.
Financial public relations.
Staffing and organisation.
Policy evaluation from a public relations standpoint.

Group D

Artefact Production
The option will be taught mainly on a tutorial/consultative basis.
Tuition will be offered in various media, depending on student demand.
Students will produce examinable communication artefacts according to an approved outline proposal. They will also be required to produce a report (5,000 words) reflecting on the production processes involved, an empirical study of the effectiveness of the finished artefact and an analysis of the finished product's relationship to the initial proposal.

Christian Communication
Communication in the context of Christianity.
The image of the Christian in a multicultural society.
Critical analysis of different studies of the Christian image through media, including video, film and television.
Philosophical, social and theological issues in Christian communication.
Christian communication and broadcasting.
Critical evaluation of print publication and training resources produced by Christian institutions.

Community Campaigns
Nature of community and campaigns; nature of social influence.
Principles and process of planning a community campaign.
Analytical frameworks including the nature of the source; intention and purpose, methods and strategies used, range of channels and effects (intended and unintended).
Impact and evaluation of community campaigns.
Case studies—examples may include local groups tackling environmental issues, attempts to change legislation.
Production of a community campaign.

International Marketing
Origins and development of global marketing.
Use of information, infrastructures and organisations in creating international strategies.
Development of policies for communication overseas: creative opportunities, coordination, constraints, costs.
Social responsibility considerations of international marketing.

Market Research
Survey design and analysis: reliability, validity, frequency distributions, contingency tables.
Introduction to less reactive approaches.
Techniques of market segmentation.
Perceptual mapping techniques.
Implementation and interpretation.

Final Examination
(a) Two three-hour written examinations on Theoretical Core III.
(b) A three-hour written examination on the option selected from Group C.
(c) A 6,000-word dissertation on the option selected from Group D.

Professional Exemptions
Students who successfully complete the Honours Degree Course in Public Media will be granted exemptions from certain examinations of two professional bodies.

(a) The Communication, Advertising and Marketing Foundation
Subject to their having completed appropriate options, students will be granted exemption from the Certificate stage of the CAM examination and may proceed straight to the Diploma if they wish to supplement their Degree with a post-graduate qualification.

(b) The Institute of Marketing
Students will be granted exemption from the Certificate stage of the Diploma of the Institute of Marketing. Within a year of graduation, they will be able, by following an appropriate post-graduate part-time course, to become Graduate/Associate Members of the Institute.

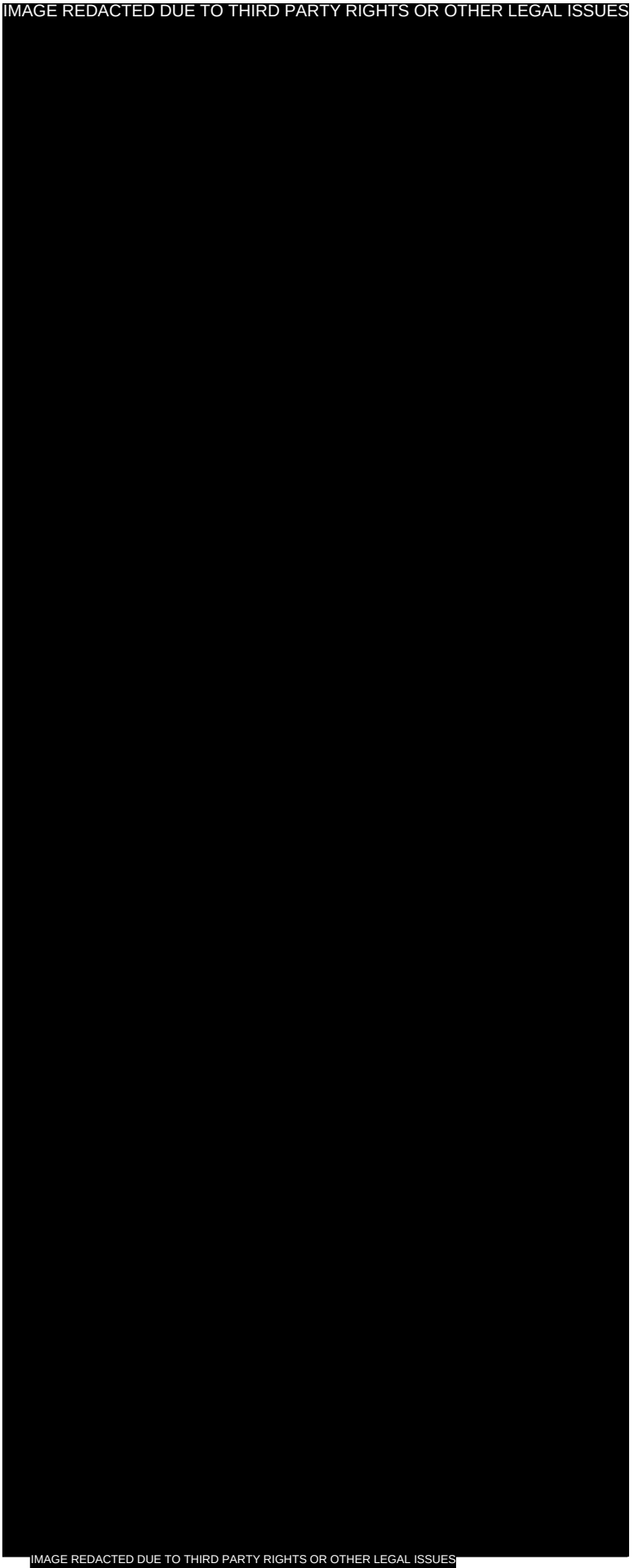
Appendix IX

The Media Studies Polemic

The following pages contain reproductions of some of the articles which have appeared in the press over the past two years, and which evaluate the higher educational field. The first article by N. Cohen is particularly interesting to the extent that it illustrates a symbolic ruler of consciousness, according to which "'media studies'" is oppositioned to "science". In general, attacks like those in the second article by A. Anthony can be regarded as a response by more traditional sectors of higher education to the "loss" of canonical texts which are typical of especially the more critical, and "postmodern" combined courses in media studies.

The following is a list of the articles that are reproduced:

- Nick Cohen, "Dons despair as students spurn science in favour of 'media studies'" in The Independent on Sunday, June 25, 1995.
- Andrew Anthony, "School for soaps" in the Observer Review, January 21, 1996.
- Peter Golding, "Media Success Story", letter to Times Higher Education Supplement, May 31, 1996.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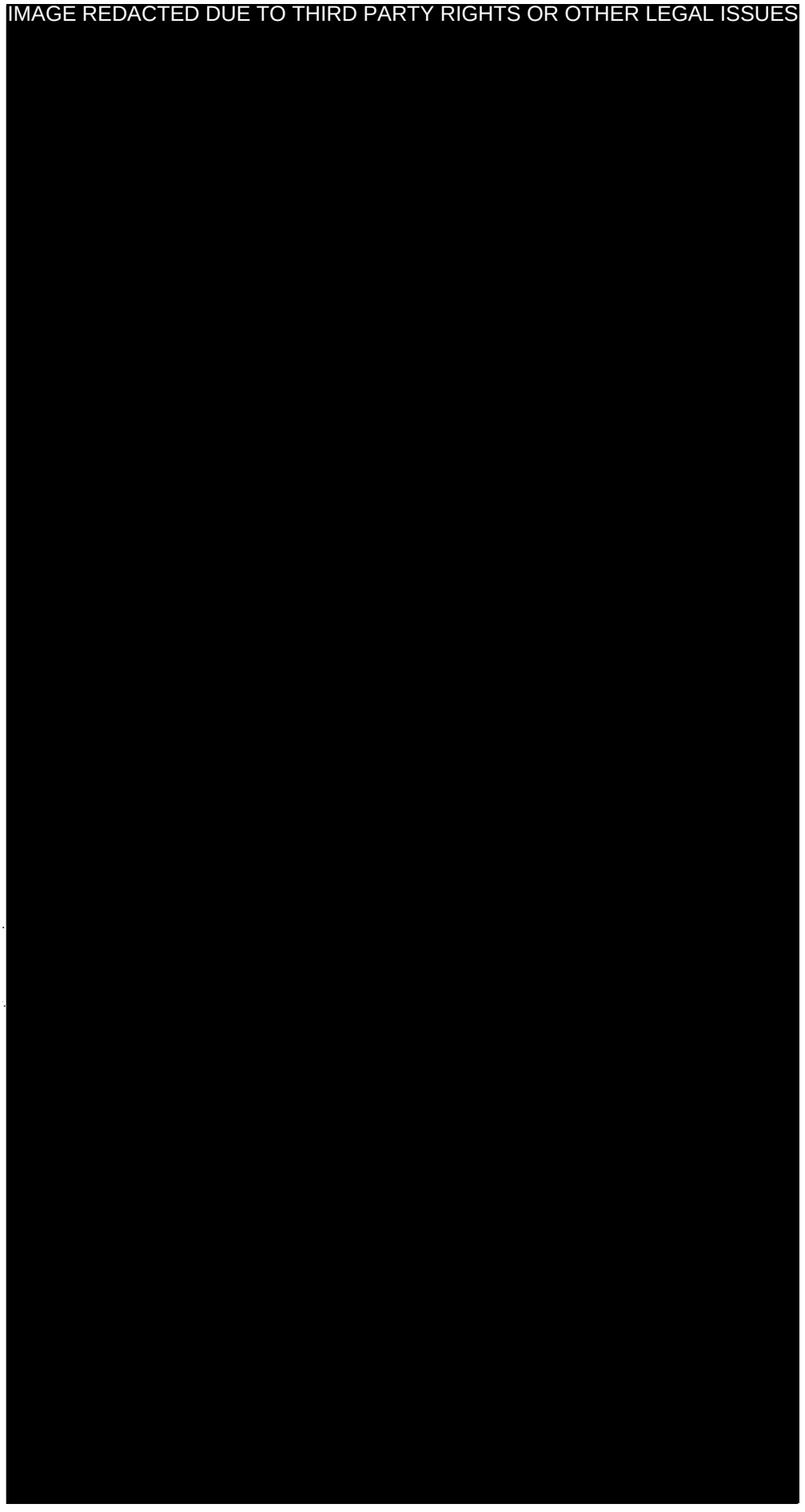
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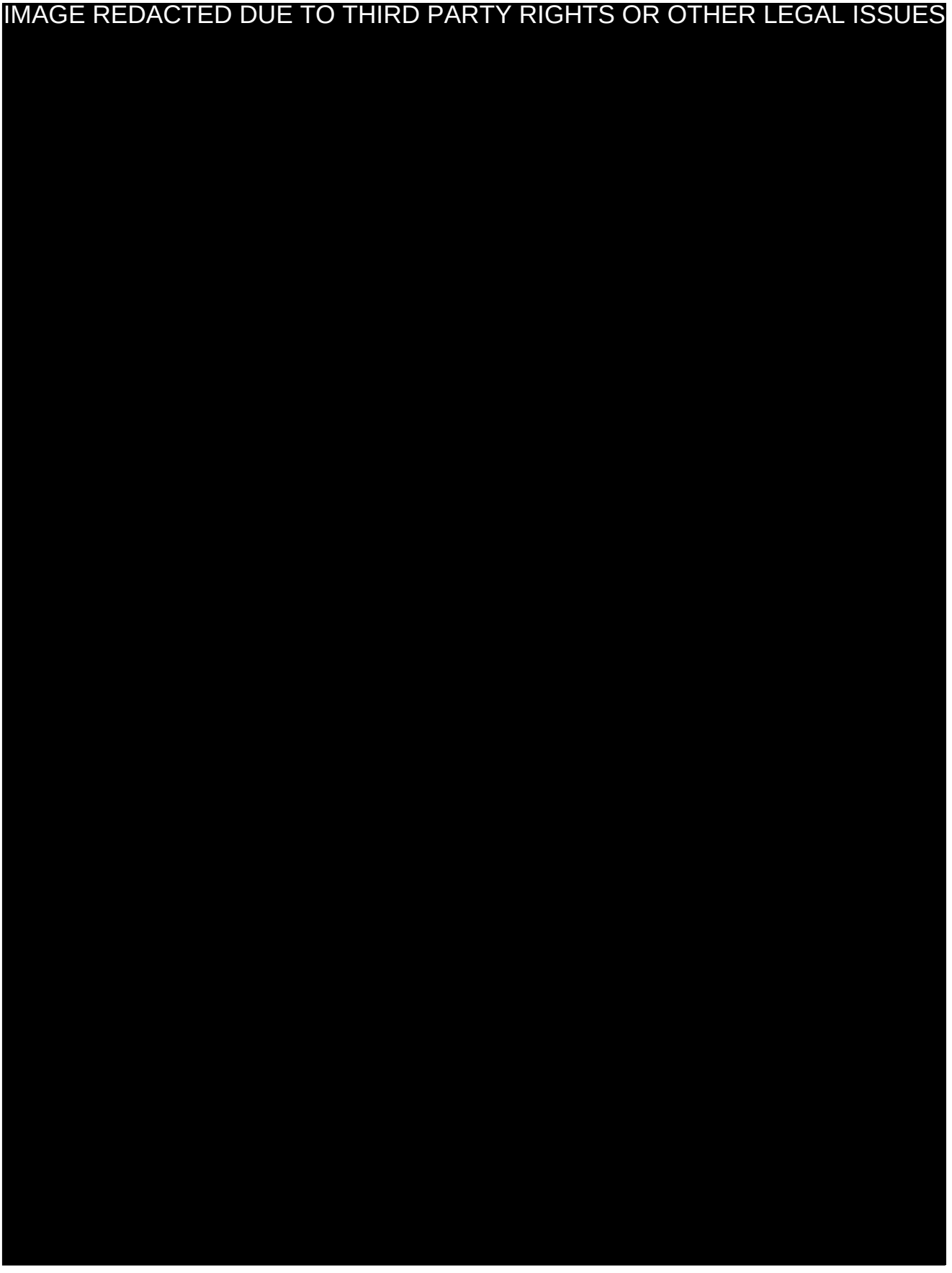
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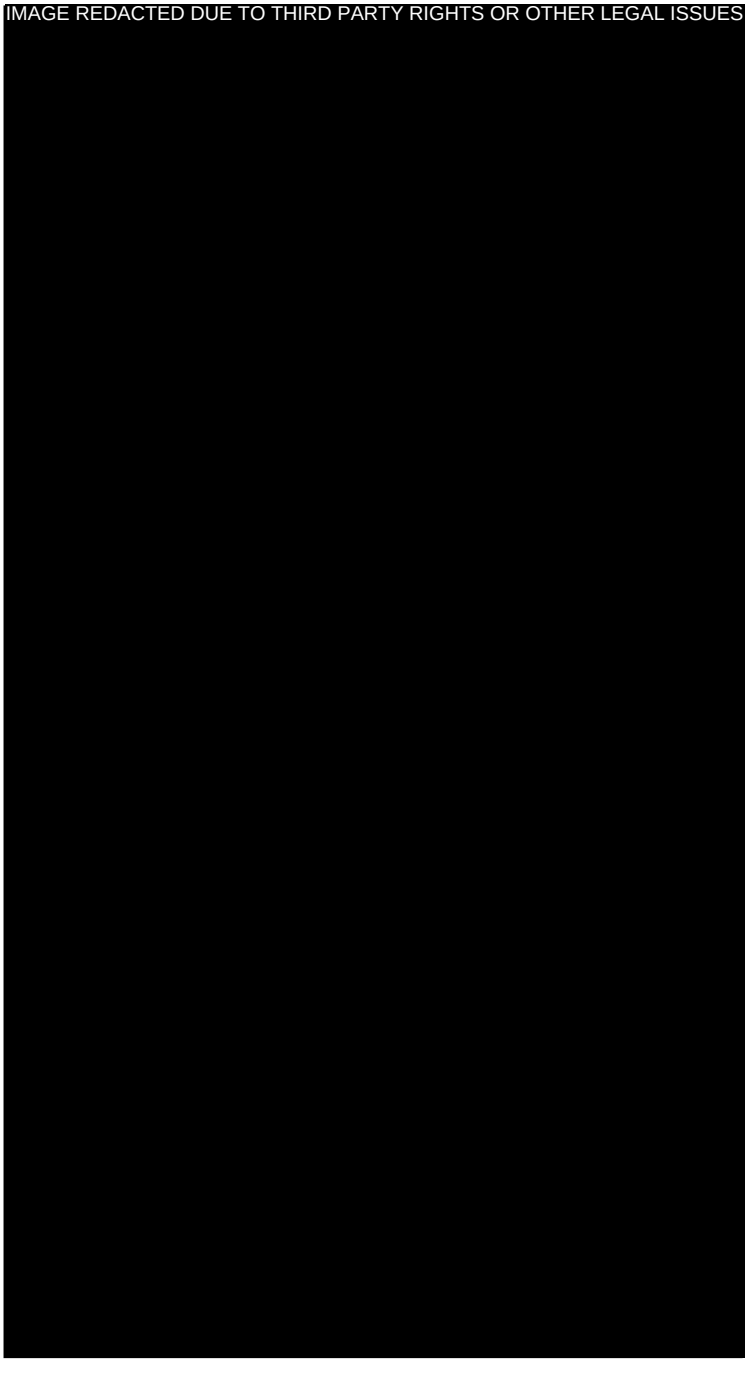
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Appendix X

Original Module Description for Communicating Science

The following is the original description of the Communicating Science module provided by the SCC course description (cf. extracts in Appendix II).

COMMUNICATING SCIENCE

First Year
Single Module
Core Module

Aims

1. To introduce students to the approaches, concepts and research relevant to considering how scientific knowledge and developments are communicated to non-scientists;

2. To examine a range of kinds of materials which embody such communication, and to develop in the students skills of analysis of such materials;

3. To consider the ways in which popular conceptions of 'nature' and 'science' are interwoven with conceptions of power, hierarchy and gender;

4. To lay a foundation of skills so that the students are able themselves both to design and practice such communications and to critically evaluate their own attempts.

Content

There is a growing body of research, drawing on several traditions of enquiry, into the ways in which scientific ideas are communicated to non-scientists, most notably relating to Television's presentation of science in news and documentaries, but also considering the presentation of science in popular forms of culture. In order to understand this research students will need to be introduced to several conceptual debates, notably about the idea of 'discourse' (especially in relation to the mass media), theories of media/audience relationship, and concepts of news and documentary (bias/selection/construction).

Also, there has been a rising interest in the ways in which conceptions of the natural world as an object of study themselves bear the marks of our culture: from the ways 'nature' is conceptualised in scientific enquiry, to the ways in which practices towards non-human species reflect historical and cultural attitudes towards the natural world.

Introductions to these will be linked with learning how to make close analyses and deconstructions of Televisual presentations of science; and hence to the practical design and making of small audiovisual presentations of, for example, a TV science news item. For this purpose students will be involved in practising front-of-camera skills such as scripting and storyboarding, production of graphics, and sequencing.

Indicative bibliography

C GARDNER & R YOUNG	'Science on TV: A Critique', in T BENNETT et al.: Popular Television and Film
ROGER SILVERSTONE	Framing Science: the making of a BBC documentary (BFI 1985)
JOHN CORNER et al.	Nuclear Reactions (Libby Press 1990)
LEN MASTERMAN (ed.)	Television Mythologies
PETER FARAGO	Science and the Media (Oxford University Press 1976)
D W BIRKETT	Writing Science News for the Mass Media (Gulf Publishing 1983)
S M FRIEDMAN et al.	Scientists and Journalists: reporting science as news (Free Press 1986)
J H GOLDSTEIN (ed)	Reporting Science: the case of aggression (Lawrence Erlbaum 1986)
PAUL CHILTON (ed)	Language and the Nuclear Arms Debate (Frances Pinter 1985)
CAROLYN MERCHANT	The Death of Nature
CAROLINE McCORMACK	Gender, Nature and Culture
RAYMOND WILLIAMS	'Ideas of Nature', in his Problems in Materialism and Culture (Verso)
JOHN BERGER	'Animal as Metaphor' (New Society 1977)
WILLIAM LEISS	The Domination of Nature

Teaching methods

The module will use a variety of teaching methods, from the traditional lecture and seminar, to workshops closely analysing media presentations of science.

Assessment

This is designed to give students the opportunity to display their understanding of the approaches and research on which the module is drawing:

Formative work:

One textual analysis at 20%
One standard essay at 30%

Summative work:

Group audio-visual project at 50%

Module Co-ordinator

Appendix XI

Communicating Science Syllabus for 1994/95

The following pages contain the syllabus provided to students who took the Communicating Science module during the 1994/95 academic year. (Aspects of this document have been modified to protect the identity of the course, of the University and of the Audio-Visual Services instructors.) This document can be regarded as a para-curricular marker that realises in the written medium and genre of the syllabus, the framing procedures which I analyse in chapter three. The following pages illustrate the extent to which framing involves the dimension of control.

BA (Hons)
SCIENCE, COMMUNICATION AND CULTURE

Course Programme for

COMMUNICATING SCIENCE

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Introduction

Welcome to Science, Communication and Culture (SCC) and to Communicating Science. This introduction to the module will provide an overview of a) what the module will be teaching you and b) how it's structured. In class we will discuss each of these points so that you can ask questions about anything that is not clear to you.

1. Understanding what it means to communicate about science and nature

This module will teach, as the title suggests, about the communication of science and nature. But our approach to the whole problem of communicating science will be quite different from what you might expect. The notion of communication itself, which may seem to be so straightforward, actually involves a highly complex social process. The module will begin by explaining this social process, especially in relation to the different types of institutions and professional ideologies that are at work in the process of mass communication.

Thereafter, the module will provide you with more accurate and more subtle ways of thinking about the communication or "popularization" of science. Although we tend to think that popularizing science means "simplifying" or making science "understandable", the module will show that here too, there is a lot more complexity than meets the eye, and that here too, there is a social process which needs to be understood in terms of the interests of specific institutions and ideologies.

Why is it important to learn this, you might ask? Thinking about the communication of science in the ways mentioned above will enable you to adopt a more critical approach. It will, for example, help prospective journalists to decide for themselves when a scientific issue is being misrepresented by an institution with "hidden" interests; or conversely, when an issue that is *not* being dealt with by anyone, *should* be dealt with in the media. These are the kinds of skills that the best researchers or journalists have, and this course will help you to begin to develop them.

This approach will also help you to assume a more analytical stance vis-a-vis your own video productions about science and the environment, which this course will teach you to plan, shoot, and edit. Indeed, this course will provide you with both an introduction to more critical ways of thinking about the communication of science; and an introduction to basic video production skills.

2. How it all comes together

It might seem that these are two very different activities (critical analysis on the one hand, and video production on the other)--in fact, they are and will be closely related in this module. Here's how: the module is divided into three types of activities, which you will be engaging in every week: lectures, seminars, and workshops.

In the lectures, we will be doing a series of case studies that engage in critical analyses of the way in which scientific and environmental issues are represented in the media. Although emphasis will be on analysing T.V. programmes about science and the environment, we will also be discussing other media such as science journals and the tabloid press.

In the seminars, we will be planning your own video exercises, and then analyzing the results, as if they themselves were "case studies" in the communication of science. This will enable us to use the theories and concepts taught in the lectures to analyze your own work.

Finally, in the workshops, you will be learning the technical aspects of video production, and will be actually producing the exercises mentioned above.

You yourself will be expected to help the process of integration of these different activities in the following ways:

a) you will be expected to attend all three educational modes (lectures, seminars, and workshops) every week so that there are no gaps in your understanding;
b) you will be expected not only to plan your video exercises, but to present these plans in the seminars so that we can discuss their virtues and limitations;
c) you will also be expected to engage in the analysis of your videos on the basis of the terms and ideas introduced in the lectures.

If you do this, and if you keep up with the module readings, then this will be a very stimulating and challenging module. One that combines the best of both worlds: close analysis of fascinating videos about thinks like the "Killer Bug", fox hunting, estrogens in water, etc.; and production and close analysis of your own videos about science and the environment.

Assessments

This module will require you to hand in three assessments. These are described in an introductory fashion below. Please note, though, that each assessment is described in more detail at the end of this course description.

1. Assessment No. 1: treatment

The first assessment in the course will take the form of what in the TV industry is known as a "treatment". A treatment is basically a short description of a video which you would like to produce. It states

- the subject of the video
- why it is important
- what audience the video is aimed at (this will require some extra research)
- how the video is to be structured, in terms of the audio-visual narrative.

Each person will be submitting a treatment individually, and will be marked individually. However, each group will then select the treatment which it believes to be most interesting and feasible to produce for its final production (more on the final production, below). You should thus research and write a treatment which can be produced *with the resources at hand.*

This assessment should be typewritten with double spacing, and should be of no more than 1000 words or four typewritten pages, whichever comes first. You should provide full references for any quotes or ideas which are not your own, in accordance with the guidelines provided in your essential papers.

2. Assessment No. 2: textual analysis.

The case studies taught in the lectures will provide you with the skills required to engage in what is known in media and cultural studies as a textual analysis. Doing a textual analysis involves explaining in a rigourous manner how a media piece represents some scientific or environmental issue. This involves explaining

- how the media piece is structured, in terms of the A/V narrative;
- what argument(s) it puts forward;
- what "philosophical" assumptions the argument is based on;
- how the argumentative strategy "positions" the reader/viewer to respond to the issues portrayed.

For this second assessment, you will be asked to do a textual analysis of a popular science piece (a list of options will be provided). This will be a group assessment, to be undertaken in groups of no less than two, and no more than three people. It

should be typewritten with double spacing, and should be of no more than 2000 words. You should provide full references for any quotes or ideas which are not your own, in accordance with the guidelines provided in your essential papers.

3. Assessment No. 3: the final production

During the entire first term, and then during the first half of the second term, you will be doing exercises which will give each of you the chance to produce a short video news piece on a scientific or an environmental issue. These videos will be carefully planned and analyzed, but will not be marked.

After each person has had a chance to plan and direct their own piece, the production groups will select a treatment from amongst the ones you handed in (see assessment No. 1), and will elect producers, camerapersons, etc. to produce the final production.

This final production will be marked, but it will be marked in a manner that takes into account a number of different factors. These are spelled out in detail on pp. 25 and ff. For now, it suffices to say that the mark will be split into two main parts: a group mark, which takes into account amongst other things,

- the script
- how well the group works as a group
- how good the final video itself is;

and an individual mark, which will be based on your participation in the group work, and on an individual report which you will be handing in with the final production. This report will require you to analyze and evaluate your own video and production process using the terminology and analytical skills taught in the lectures and seminars. In effect, this report will be a test of your capacity to use the media analysis skills taught throughout the year.

4. The assessments, in relation to lectures and seminars

In a course like this, it's tempting to think that the absence of an unseen exam at the end of the module means that you don't really have to learn anything...

In fact, the opposite is true: in all three assessments you will have to demonstrate that you've mastered the different ideas taught in the lectures and seminars.

This will actually require you to learn the material in more depth because it will not suffice to simply "regurgitate" the terms and theories learnt in the course. You will have to demonstrate that you can employ the analytical skills you've been taught, in new contexts... so don't fall behind in your reading, and make sure that you attend all lectures, seminars and workshops!

5. Submission Dates

Assessment No. 1 (Treatment)

Due by: Jan. 27, 1995
Percentage of final mark: 20%

Assessment No. 2 (Text. Analysis)

Due by: May 5, 1995
Percentage: 30%

Assessment No. 3 (Production)

Due by: (several deadlines)

a) Final draft of script: March 23
b) Video itself: May 19
c) Individual report: May 31

Percentage: 50%

Please note: University regulations state that failure to meet any of these deadlines will result in a 0 for the assessment not handed in. In Communicating Science, this will apply both to written, and video production assignments.

Communicating Science, at a glance...

	LECTURE	SEMINAR	WORKSHOP
TERM 1			
1	Introduction to Communicating Science	Introduction to course	Introduction to workshops
2	Intrumental Conceptions of Communication	Discuss intrumental conceptions communication	Introduction to workshops
3	Critical Conception of Communication	Discuss symbolic forms Plan exercise 1(E1)	Introduction to workshops
4	Critical Conception of Communicating Science	Compare science and popular science	Shoot E1
5	Institutional structure of TV production	Discussion of TV prod. Plan E2	Edit E1
6	Reading Week	No classes	No classes
7	The discourse of "Public Service"	Analyze E1, discuss concept of discourse	Shoot E2
8	Consumer/Producer "Choice"	Plan E3, discuss concept of ideology	Edit E2
9	Gender issues in T.V. production	Analyze E2, discuss sex discrimination in TV	Shoot E3
10	TV News	Plan E4, discuss genre	Edit E3
11	TV News	Analyze E3, discuss TV news	No Workshops
TERM 2			
1	Talk Shows: Media Effects	We will discuss Assessment No. 1	Shoot E4
2	Talk Shows: Media Effects	Plan E5, discuss "media effects"	Edit E4
3	Ideas of nature	No seminars- union meetings	No workshops- union meetings
4	Animals in adverts	Analyze E4, and select treatment for final prod	Shoot E5
5	Nature in natural history documentaries	Plan E6, and discuss final productions	Edit E5, distribute functions for prod.
6	READING WEEK	No classes	
7	Sexism in natural history documentaries	Analyze E5	Shoot E6
8	View Horizon docu. on estrogens in water	Plan E7 (if group of 7) Work on scripts	Edit E6
9	Analyze Horizon documentary on estrogens in H20	Analyze E6, work on scripts	Shoot E7 or work on scripts
10	View Dispatches on estrogens in H20	We will work on scripts.	Edit E7 and/or work on scripts
11	Analyze Dispatches	Analyze E7 and/or talk about Assess. No. 2	No workshops

	LECTURE	SEMINAR	WORKSHOP
T E R M 3			
1	Science and beauty	Plans for final production	Final production
2	Science and beauty	Progress reports from groups	Final production
3	Concluding lecture	Progress reports from groups	Final production
4	No lecture	No seminar	Finishproduction
5	Show projects to designated audiences, and critique results		
6	Hand in individual reports		

The course, week by week*

Term 1

Week 1 **Lecture:** This lecture will be devoted to an overview of the course structure and content.
Seminar: This seminar will introduce the course.
Workshop: There will be an introduction to rules for the use of equipment, etc.
Readings: Look over course programme, and read introduction of lecture notes, Communicating about Science and Nature. Please note: *primary readings are recommended at the end of lecture notes. You should read some of these throughout the year. See also, the course bibliography at the end of this booklet.*

Week 2 **Lecture:** Why are popular notions of communication misleading?
Seminar: We will discuss some of the implications of today's lecture.
Workshop: Familiarisation with equipment/production procedures.
Readings: Communicating about Science & Nature (1).

*Please note: some of the suggested examples and lecture topics may be changed due to unexpected problems in scheduling, availability of video equipment or media texts; or to the availability of new media texts.

Week 3 Lecture: What is a Social Semiotic conception of communication, and why is it more critical than the "instrumental" approaches to communication?
Seminar: We will discuss symbolic forms, and will plan your first exercise.
Workshop: Familiarisation with equipment/production procedures.
Readings: Recommended readings at the end of Communicating about Science and Nature, (1).

Week 4 Lecture: What is involved in communicating about science? Does it just involve "simplifying" science? Indeed, is it true that popular science is "simpler" than science itself?
Seminar: We will compare and contrast a science, and a a popular science piece, using G. Myer's (1990) model.
Workshop: Shoot Exercise 1 (from now, abbrev. as "E1").
Readings: Communicating about Science & Nature (2). See also, G. Myers, Writing Biology, chp. 5.

Week 5 Lecture: This lecture will discuss mass communication, and media institutions. We will examine in some detail how institutional structues and dynamics are involved in the production of a popular science TV programme.
Seminar: You should come prepared to discuss how it felt to be part of an organisational structure with a hierarchy and a division of labour. How did it affect your thinking, and your capacity to make decisions? But also, what did it make possible? We will review your plans for E2.
Workshop: Edit E1.
Readings: Review section on mass communication in Communicating about Science and Nature (2). You will also be given some additional handouts that discuss TV production.

Week 6 No classes - reading week. Reading weeks provide you with the opportunity to catch up with any reading you haven't been able to do, and/or to read ahead. You should also read some of the additional recommended literature (see end of each set of lecture notes).

Week 7 Lecture: In this lecture, we will explain a key concept: the concept of discourse. We will do so by discussing an example of discourse which has had an enormous historical impact on broadcasting in general, and in communicating science in particular: the discourse of "public service". What is "public service", what arguments is it based on, and what are its pro's and con's?
Seminar: We will analyze E1, and will discuss the implications of the concept of discourse.
Workshop: Shoot E2.
Readings: Course handout on "public service broadcasting"

Week 8 Lecture: In this lecture, we will critique another extremely powerful discourse which has had an enormous impact on society in general, and on broadcasting institutions in particular (it is also one that in some respects has replaced the "public service" discourse): the "new conservative" discourse of institutional "efficiency" and "consumer choice". We will analyse the work of this discourse in the recent transformations which have taken place in the BBC. In doing

so, we will discuss in more detail another key concept for this course: the concept of ideology.
Seminar: We will discuss the concept of ideology.
We will also review your plans for E3
Workshop: Edit E2.
Readings: See section on ideology in Communicating about Science and Nature (2)

Week 9 Lecture: In an earlier lecture, we discussed the way in which institutional structures and dynamics may be exclusive--that is, they exclude some people or social groups. In this lecture, we will analyse how TV production institutions have in various ways excluded women. In doing so, we will be analyzing the workings of another ideology.
Seminar: We will discuss the implications of the lecture, for your own production. We will also analyze E2.
Workshop: Shoot E3.
Reading: Course handouts, "Feminist critique and the the communication of science and nature".

Week 10 Lecture: Beginning with this lecture, we will start to look closely at the discourse of television *programmes* themselves, esp. the way in which science & nature are represented and structured on T.V. In today's lecture we will look at TV news. As part of this process, we will discuss the concepts of "text" "genre", and "modality".
Seminar: We will discuss the concepts introduced in the lecture, especially genre. We will review your plans for E4,
Workshop: Edit E3.
Readings: Communicating about Science and Nature (3).

Week 11 Lecture: We will continue discussing TV news.
Seminar: We will analyze E3, and will discuss problems of "objectivity" in news reporting: what constraints might make it difficult for you to be more "objective" in your own reporting?
Workshop: No workshops.
Readings: Communicating about Science & Nature (3)

Term 2

Week 1 Lecture: As a prelude to next week's analysis of a panel discussion on censorship and media effects, we will explore the history of moral panics about media effects. In doing so, we will return to some of the issues that were discussed at the beginning of the course: what is problematic about linear models of communication and "hypodermic" notions of media effects?
Seminar: We will discuss what you will be required to do for your forthcoming assessment (the treatment) and in so doing will begin to talk about your final projects.
Workshop: Shoot E4.
Readings: Communicating about Science and Nature (4).
(Please remember that each set of lecture notes recommends some additional readings which you should look at.)

Week 2 Lecture: We will analyze the way in which the Late Night Show structured a panel discussion on the matter of media effects. As part of this process, we will take a close look at the way in which the structuring of the panel determines the nature of the exchange amongst the panelists.
We will also investigate how the programme is an instance of the popularization of so-called "social sciences".
Seminar: We will plan E5, and discuss the whole question of "media effects" in relation to your own productions. Is it useful to think of what "effects" they might have on their audiences?
Workshop: Edit E4.
Readings: Communicating about Science and Nature (4).

Week 3 Lecture: We will begin to discuss the way in which ideas of nature are represented on TV. There are a number of discourses about "nature". What are some of the historical antecedents of these, and how do they affect some of the current debates about environmental issues?
We will illustrate these issues by looking closely at some media texts that respresent ideas of nature.
Seminar: There will be no seminars because of union meetings
Workshop: There will be no workshops because of union meetings.
Readings: Communicating about Science and Nature, (5).
JANUARY 27 IS THE DEADLINE FOR ASSESSMENT No. 1.

Week 4 Lecture: We will continue analyzing the way in which ideas of nature are represented on T.V. In today's lecture, we will look at the R5 advertisement which uses bears, and we will introduce the notions of theriomorphism and anthropomorphism proposed by S. Baker in Picturing the Beast.
Seminar: We will analyze E4, and you will work in production groups to decide what treatment you will use for your final production.
Workshop: Shoot E5
Readings: Communicating about Science & Nature, (6).

Week 5 Lecture: Today we will begin to analyze ideas of nature at work in natural history documentaries. We will discuss the "nature" of this genre, which is perhaps the "purest" exponent of the urban, and romantic discourse which opposes man and nature, the city and the countryside.
Seminar: We will plan E6, and will begin to discuss the final production.
Workshop: Edit E5, and distribute functions for final production. Please don't forget to write this information, plus the treatment you've selected, on a piece of paper which you hand in to Nils in the next seminar.
Readings: Communicating about Science & Nature, (7).

Week 6 No classes - reading week.

Week 7 Lecture: We will continue to analyse natural history documentaries. In this lecture, we will look the sexist nature of many natural history documentaries.
Seminar: We will analyze E5 and will use any time left over to continue discussions of final productions.
Workshop: Shoot E6

Readings: See the B. Crowther piece in "Feminist critique and and the communication of science".

Week 8 Lecture: We will view a Horizon documentary about estrogens in our drinking water.
Seminar: We will plan E7 (if group has 7) and begin working on scripts.
Workshop: Edit E6, while other members work on script
Readings: No readings-- work on your script so that you can have your rough draft ready for next week.

Week 9 Lecture: We will analyze the Horizon documentary. We will discuss how the documentary's narrative attempts to "position" the viewers vis-a-vis the problem of estrogens in our drinking water.
Seminar: We will analyze E6, and will work on the scripts if there is any time left over.
Workshop: Shoot E7, or work on researching and scripting your final production.
Readings: Communicating about Science & Nature, (8).

Week 10 Lecture: We will view a Dispatches programme which deals with the same problem that the Horizon programme did (estrogens in water).
Seminar: We will work on scripts.
Workshop: Edit E7 and/or work on scripts
Readings: Communicating about Science and Nature, (8).

Week 11 Lecture: We will analyze the differences between the ways in which the Dispatches version, and the Horizon version of the estrogen problem attempt to position us as viewers. By doing this, we will understand more clearly the importance and nature (!) of genre and of the ways in which texts "position" readers.
Seminar: We will analyze E7 if there are 7 people in the group, and/or we will discuss requirements for assessment No. 2.
Workshop: No workshops
Readings: No readings so that you can work on final script.
MARCH 23 IS THE DEADLINE FOR THE FINAL DRAFT OF THE SCRIPT.

Term 3

Week 1 Lecture: We will discuss problems relating to "human nature", by examining a "scientific" piece on the beauty of women.
Seminar: Each group will be reporting about how it plans to carry out the production process.
Workshop: Final production
Readings: Communicating about Science & Nature, (9).

Week 2 Lecture: We will continue with last week's subject, this time examining how the "scientific" piece is popularised.
Seminar: We will discuss how your final production is coming along, and I will explain what each person will need to hand in for assessment No. 3.
Workshop: Final production.
Readings: No readings so that you can complete your textual analysis.

MAY 5 IS THE DEADLINE FOR ASSESSMENT NO. 2.

Week 3 Lecture: This will be the concluding lecture, in which I will speak of ways in which communicators could adopt a more ideologically critical stance with respect to science and nature. There will be a course evaluation as well.
Seminar: We will discuss how your final production is coming along.
Workshop: Final production (you should probably be editing by now)
Readings: Communicating about Science & Nature (10).

Week 4 Lecture: No lecture.
Seminar: No seminar.
Workshop: Final production (you should plan to complete your production during this last workshop).

Week 5 There will be a session in which we will view and critique each group's final project. You should invite the people you interviewed for your treatment to this session.

Video exercises

This course will also teach you the basics of video production. Below you will find a series of detailed instructions which provide guidance for the video exercises. Please read these carefully and see the course lecturer well before your exercise is due if you have any questions about them.

1. Description

The course will be divided into groups of six or seven students. Each production group will meet for a two-hour workshop each week. After a preliminary period of familia-risation with the equipment and with production routines, each group will begin a process of continuous video production. Here's how it will work.

Each person will be asked to be producer/director of a video that will last no more than 1 minute, and which will take the form of a short news piece about some science/environmental issue. This piece should be the result of some research which you do on some science/environmental topic, and which you will present in a seminar approx. a week before you are scheduled to shoot.

2. Seminar Presentation

Each producer/director will be asked to describe his/her idea on a single sheet of paper which describes

- the subject of the video
- the places and people you'll be videoing, including location(s) where you'll shoot, persons you'll interview;
- the treatment you have in mind, including possible camera angles and shots, plus questions you'll be asking your interviewees.

As was mentioned earlier, his information will be described by the producer/director to the rest of the group in a seminar session a week or so before the exercise begins. Without this presentation, you will not be allowed to produce/direct your piece.

Please give Nils a copy of the written information before the seminar begins.

3. Shooting the video

A week or so after you've presented your plans for the exercise, you will have a workshop session devoted exclusively to shooting your video, *with the help of the rest of the members of the group (everyone will be expected to chip in, even if it's not their own video).*

You will be videotaping:

- contextualizing images of whatever topic is being covered;

- an interview in the field with one or more persons, which will be edited into the overall narration;
- a conclusion in which the presenter makes some closing comments and identifies the group s/he is working with.

Since each producer will only have two hours to shoot the piece, you should be sure to arrive punctually to the workshop. You should also make sure that you've used the pre-production period (including the seminar) to prepare yourself for the production process-- otherwise you will lose valuable time trying to figure out what you want to do.

3. Editing the video

The next session will be devoted exclusively to editing, and providing the voice-over narration for your video. As director/producer, you will have two options vis-a-vis the voice-over narration: you can either take the "rushes" (raw footage) and prepare a voice-over narration at home; or you can do the voice-over narration "on the spot" the day of the editing process. The first option gives you more time, and should probably be used by those who don't do well working under extreme pressure. The second option is more "realistic" in that this is how news reporters frequently work, but requires you to be sharp and inventive while working under severe time constraints.

4. Some examples of video exercises you might do

- Interviewing some lecturer about his/her area of expertise, in relation to some scientific/environmental issue;
- Interviewing students on campus to find out what they think about some scientific/environmental issue;
- Investigating environmental problems on campus or in the Fishponds area.

Whatever the subject, you will be expected to produce a short news piece, that follows the conventions or format of TV news about science and the environment. (we do not want "video art"!)

5. Rotation

Since each person will have a chance to do produce/direct a piece, we will be operating on the basis of a system of rotation. This means that each person will be able to produce/direct, but also each of the following functions:

- presenter
- camera
- sound
- lights
- editing
- researcher

Indeed, although you will be directing/producing one produc-tion, you will also perform each of the other

functions, on a rotating basis, during other people's exercises.

Although these exercises will not be marked, you are expected to be present for all exercises. Indeed, any student with a record of two or more unexcused absences will not be allowed to produce/direct his/her own exercise. If there is low attendance after the person has done his/her exercise, then she/he will not be allowed to take key functions during the final production.

Assessment No. 1: Treatment

The first assessment which you will be handing in is known as a "treatment". Below you will find a description of the assessment, as well as guide-lines for its completion.

1. Description

As was explained earlier, a treatment is a short description of a video project which you would like to produce. It states

- the subject and genre of the video
- angle
- what audience the video is aimed at (this will require some extra research)
- how the video is to be structured, in terms of the audio-visual narrative.

Your first assessment for this course will be the submission of a treatment which conforms to the guide-lines which are explained below.

Each group will select one of the submitted treatments for its final production. Therefore, you should assume that you are writing a treatment for a video project which your group could actually produce, even though there is no guarantee that it actually will be selected for the final production.

This means planning for something which is fun and exciting (and ideologically critical!), but also something that can be produced given the facilities and time you will have for the final production. At this stage, it may be useful to read the instructions for the final production so that you can get an accurate idea of what limitations you'll be working with.

2. The subject of the treatment

This is a course about the communication of science and/or environmental subjects or issues. The topic of your video should thus be about some science and/or environmental issue.

In particular, it will be a requirement that SCC students should deal with subjects or issues which their Issues module, or any other SCC module, has explored during the first term. Although this may seem to be an unnecessary restriction, it is meant a) to promote a greater integration between the different modules and b) to provide you with a research base with which to approach your subject ie. if you use what you've learned in other modules, you will not have to start your research from scratch.

3. The genre of the video that would be produced

The notion of "genre" refers to a particular type or style of programme. Examples of genres are news, documentary, drama, poetry, etc. Genres are key to the extent that they help to "synchronize" the communicative activities of producers and viewers: producers need genres to know what type of programme they are producing (news, documentary, etc.) and viewers need to know what genre a given programme is in order to know what to expect from it (as viewers, we classify programmes on the basis of genre, and this affects the way we watch a programme. We expect, for example, different things from news, and from soap operas).

This course will be concerned with so-called factual genres, but especially with news and documentary. Your treatment should be for a two minute news piece, of the type that is typically broadcast during the evening news (eg. Channel 4 7 o'clock news).

Your mark will depend in part on whether or not you actually propose a project in this genre and not another, so it is key that you stick to the news genre, which will be described in the lectures.

4. The "angle"

Your treatment will also have to explain what "angle" you take in your approach to whatever topic you finally choose. In a sense, the notion of "angle" is almost synonymous with "treatment". Angle refers to how you delimit and "frame" whatever subject you choose. Here's an example: you could choose to do a video on New Age travellers, but your angle might be "a day in the life of a New Age traveller", or "New Age travellers' beliefs about nature". Determining the angle is key to the extent that it allows you to decide what to include, and what to exclude from a potentially vast subject area. If you choose a good "angle" or approach, you will also find that it will help you in constructing a good narrative structure for your script. It is also key in determining how your viewers understand an issue.

Clearly, your "angle" will be linked to questions of genre, audience(see point 5 below), and production resources. Even so, it will also depend on what knowledge and what beliefs you have of whatever subject you pick. So you should refer back to what you've learned in your other modules (remember, you must pick a subject or issue which has been or is being covered by your SS&M or Environmental Science course) and you should provide full citations for any texts/sources you quote.

5. Designating an audience

We will be learning that communication is about producing *and* receiving messages. This, however, does not become explicit unless we actually engage in face to face communication, or unless we say who we have in mind as an audience for a programme. Ideally, we communicate not only on the basis of what we know or don't know, think or don't think, but also on the basis of what our audience knows or doesn't know, thinks or doesn't think about the subject. Otherwise we speak in a vacuum!!

In order to do this in your treatment, you will be asked to decide what type of audience you would want to communicate with if your treatment was chosen for the final production. It might be a group of students you share a flat or house with (but not from our own course, please!), it might be your parents, etc. What you will be asked to do is not only to "designate" that audience, but also to interview them. What do they know about the subject? If there is some big issue which the popular press has covered, has your audience read or hear about it? If so, what do your interviewees feel about the subject, where do they stand? On the basis of their answers, you would then proceed to propose a video project which would try to engage with your audience's level of knowledge, and with their opinions or discourses. If you feel that they've been misinformed, you may want to do a news piece that provides more accurate information. You might also want to explain something they haven't understood.... but all in a way which would take into account the fact that a) you must try to provide a balanced coverage which represents a variety of points of view provided by well informed sources; and b) that it's TV that your audience would be watching (if this were "for real"), and that there would thus be other channels competing for their attention!!

So in your treatment, you should include a) who your designated audience is (say, two or three people); b) what you asked them and what they responded; and c) how your treatment will engage with these people, and their discourses.

6. The structure of your proposed video

Earlier, it was noted that having an angle provided the beginning of a structure to your video. Your treatment should conclude by giving a clear outline of the structure which your proposed video would have. Bear in mind that the final production would include

- an introduction and contextualizing images of whatever topic is being covered;
- a voice-over narration which is clearly structured and readily understandable;

- an interview in the field with one or more persons, which is edited into the overall narration;
- a conclusion in which the presenter makes some closing comments and identifies the group s/he is working with.

Whatever outline you suggest should keep all of the previous points (genre, angle, audience) in mind.

7. Marking criteria

Your treatment will be marked on the basis of the extent to which it provides all of the information required above. I will be looking for evidence of
- originality of ideas
- suitability and feasability of the ideas, given the genre constraints (it must be TV news) and pro-duction constraints faced by production groups;
- research, which includes the use of texts, library resources, and any other materials you might find useful; plus thinking of interviewing a balanced variety of appropriate sources during the video production.
- clarity of expression, that is, a well written, well organised and well justified explanation of what it is that you plan to do.

Your treatment should be typewritten with double spacing, and should be no more than 1,000 words or four pages. You should provide full references for any quotes or ideas which are not your own, in accordance with the guidelines provided in your essential papers.

8. Concluding remarks

Each person will be submitting a treatment individually, and will be marked individually, whether his/her group actually decides to produce his/her project or not. This project will be worth 20% of the final mark.

A final note. You are being asked to take the whole process of communication seriously by designating and interviewing a "real" audience. In this course, we will be discovering that any and every text has an "implicit" audience which the writer has consciously and/or unconsciously attempted to communicate with. Who will be the implicit audience of your treatment? In one sense, the course lecturer will be that implied reader: you want to persuade him that your treatment is worth a good mark, and you'll try to write it accordingly. But what about your group? Should you take them into account when you write your treatment? Who else, after all, will be reading your treatment and deciding which treatment becomes a final production? So is it possible, and desirable, to incorporate a second "implied audience" in your writing process?

Assessment No. 2: Textual analysis

This second assessment will be due after the Easter break, and forms a key part of your learning process. Since textual analysis will be explained in detail in the course and in class notes, below we will merely 1) summarize the requirements for this assessment; 2) make some suggestions for the group work; and 3) list the criteria that will be used to mark it.

1. Description and requirements

Groups of no less than two, and no more than three students will be asked to do a textual analysis of a media piece which is about, or involves scientific/ environmental issues. A list of options for analysis will be provided, which include videos, brochures, and magazine articles. If your group has access to a videotape player, it is recommended that you analyze a video. If, on the other hand, you don't have easy access to a videotape player, make sure you choose one of the non-video texts for analysis.

A number of examples of textual analysis will also be provided during the course, which should provide you with additional ideas about what it takes to engage in textual analysis. From your analysis, it should be evident that you have studied and incorporated the methods and/or findings of at least one model of textual analysis.

Your textual analysis will need to show in detail, how specific textual structures are used to (re)produce one or more discourses, which you will attempt to link to one or more concrete institutions. Textual analysis involves discursive analysis, and vice-versa; one aspect of analysis is incomplete without the other, so you are expected to demonstrate the capacity to link textual forms to discourses, and vice-versa.

The following is the recommended structure of your group report: 1) the report should begin with an introduction that explains what media text you've decided to analyze, and why you've chosen it. This introduction should also mention what *theoretical approach* you will be using to analyse the media text, and why you've chosen it. 2) This should be followed up by a second section that provides a general account of how the media text is structured, in terms of a description of the media text's overarching narrative structure. If you are analyzing a text that recontextualizes science, then this section may compare and contrast the recontextualized, and the recontextualizing piece. 3) This

will be backed up by a more detailed analysis of parts of the media piece which you consider to be particularly relevant from the point of view of the presence of discourse(s) and ideology; and/or from the point of view of discursive/ ideological transformations. Indeed, although you do not have to provide a shot by shot, or sentence by sentence analysis of the entire media piece, you will be expected to provide a close analysis of aspects of the text which you consider to be especially relevant or important for reasons which you will also explain. 4) Your analysis needs to include, as an integral part of the analytical process, how the text attempts to position an audience or audiences which you will attempt to identify. It is recommended that you contact the producers of the media piece to enquire what their "target" audience was, if there was any. If you obtain this information, then your analysis might be structured in a way that investigates what assumptions the producers make about the targetted audience; what kinds of audiences might be excluded by the text; and whether or not your analysis reveals the communicative strategy to be successful. 5) Your analysis will conclude by stating (in a concluding section) exactly what discourse(s) and (if necessary) ideologies are at work in the text, and why these are problematic. 6) Please include detailed footnotes and bibliography.

2. Doing a group textual analysis

You will be working in small groups to do this textual analysis. It is thus very important that you organize yourselves in ways which ensure that the group dynamic does not simply lead to fragmentation and incoherence in the analysis (or to one person doing all of the work to ensure coherence). You may find it easier to work with people you know, and can easily meet after class.

Each individual should read or view the media piece a number of times, and the group should meet as many times as necessary to discuss the piece collectively, to decide on a strategy of collective analysis.

Once you feel that you have understood the structure of the media piece, you will need to write the analysis.

Each person should write a section or sections of the analysis, and should put their name next to the section heading(s) so that each person can be given an individual mark

Despite this "division of labour", it should be clear from your analysis that the group has agreed on an overall interpretation of the text, and that there is linkage between the different parts. (If there is

disagreement amongst the group members about the meaning of an aspect of the text, then you might agree to record this disagreement and discuss if and why specific textual structures may have been ambiguous.)

Remember that meaning is not something that is "in" the text, but something that is created by the relationship between text and reader. To some extent, meanings will thus vary from reader to reader and it would be excellent if you yourselves could use your differing interpretations as an example of this process at work.

3. Marking criteria

Papers will be marked on the basis of their fulfillment of the list of required sections listed above. Each of these will receive equal weighting.

The group will be given a group mark, but each individual will receive an individual mark for his or her contribution, which should be clearly labelled as such. The final assessment mark for each person will then be based on an average of the two marks (50% group mark, 50% individual contribution, averaged to produce 100% of the mark for Assessment No. 2).

Please note that group marks will be marked up or down by a maximum of 10 percentage points depending on the extent to which the sections are closely inter-related and coherent amongst themselves; and individual marks will be marked up or down by a maximum of10 percentage points depending on clarity of expression.

5. Conclusion

Please bear in mind the following recommendations:

The textual analysis must be no more than 2000 words, and must be typewritten, with double spacing. You must provide full references for any quotes or ideas which are not your own, in accordance with the guidelines provided in your essential papers.

All groups should include a copy of the analysed material as an appendix at the end of the analysis. Papers without this material will not be marked.

If you analyse a video, your analysis must include an appendix with a list (though not an analysis) of all of the shots in the media text. Please be sure to number these shots, and to refer to these numbers in the main body of your analysis.

Assessment No. 3: Final production

After every person in the group has had a chance to produce/direct one exercise, we will begin work on final productions. What follows is a detailed description of this, the most important of the assessments.

1. Description.

Each group will produce a final production which will be marked and which will be worth 50% of the overall mark. Whereas the exercises have a time limit of 1 minute, the final production will have a time limit of 2 minutes. This too, will be a news item about a science and/or environmental issue. And this piece too, will provide

- contextualizing images of whatever topic is being covered;
- images of whatever subject matter is being represented;
- a voice-over narration which is clearly structured and readily understandable;
- an interview or interviews on location with people who are authoritative sources of information (these interviews will be edited into your overall piece);
- a conclusion in which the presenter makes some closing comments and identifies the group s/he is working with.

Aside from being longer, the difference vis-a-vis the exercises is that this time you will have more time to prepare for the production, and will have more time to actually carry out the production. Moreover, this time you may also find and insert ready-made images of whatever subject matter is being discussed or represented.

2. Selecting a treatment, electing a production team

As explained earlier, Assessment No. 1 requires you to hand in a <u>treatment</u> for a short video piece about scientific or environmental issues. The first step towards your final production will be selecting, from amongst the treatments handed in by the group's individuals, which treatment the group as a whole wants to produce. You should consider not only how interesting the idea/treatment is, but how feasible it is to produce.

Once you have chosen a treatment, you should decide who will perform the following functions:

- Producer/director
- scriptwriter, unless the producer/directorher/himself writes the script
- presenter
- camera
- sound
- lights
- editing

Groups with six people may decide to double up on one of these functions. When you designate functions, you should bear in mind who was most successful performing each function during the exercises. You should also bear in mind that the person who thought up the treatment is frequently-- but not necessarily-- in the best position to produce and direct her/his own piece.

Once you have decided on these matters, you should give the course lecturer a piece of paper explaining a) what treatment you're using, with a reminder of the topic; and b) who will be doing what during the production. Hand this in before you begin work on the script to make sure that the subject or topic is suitable for the course.

3. Writing a script

Once the group has selected a treatment and elected a production team, it should begin work on scripts, and/or on any research required for these. Although the whole group can and should participate in the discussion of the script, one, or at most two people should be in charge of actually writing the script. Don't let the need for consensus bog you down-- although there should always be some consultation, you must distribute work amongst yourselves. You must also respect the producer/ director's final decisions (this assumes, of course, that the producer/director is on the ball...). Please note, though, that producers/directors under no circumstances should end up doing all, or most of the work themselves.

You will be given some time to work on scripts during the seminars, and during the workshops. However it's more than likely that the scriptwriter will have to work on scripts outside of seminars and workshops as well. You will be asked to bring in rough drafts for discussion to the seminar. Please note, though, that:

There will be a deadline for the submission of the final draft of the script, and failure to meet this deadline will mean a 0 for that aspect of the production, in accordance with the university regulations for late submission of work. Moreover, no group will be allowed to start the actual production stage until they have submitted the final draft of the script.

So the script itself will have a submission date, and will be marked as part of the final production. It will be worth 20% of the final production mark, and will be marked on the basis of the following criteria:

- the extent to which it demonstrates a capacity to communicate in an audio-visual language (as distinct from a video "essay" or a "talking head") that is in keeping with the news genre; as part of this, the extent to

which it is clearly organised on the *narrative* level (providing a clear and coherent narrative structure) and is a narrative that is appropriate to the TV news genre;
- the extent to which it shows an effort to communicate with the designated audience of the group;
- the extent to which it is the result of a research process which reflects on the problems of discourses associated with the subject/problem being treated;
- the extent to which its own formal presentation *as a script* is clear and follows the conventions for scriptwriting presented in the course.

Each of these will be given equal weight.

4. Producing the video

Once each group has handed in and received some feedback on the script, it will begin the production process. Each group will need to plan its activities in a timely and effective fashion. The production will take place during the four weeks after the Easter break. Although there will be a limited amount of extra production time available for groups with technical difficulties or any other problems *beyond the group's control, (please note that this is different from problems the group should have foreseen!)* you should assume that you have no more than four summer term workshop sessions to complete the production. Any particularly disorganised groups who don't adequately use production time may find that no extra time will be available if the A/V technicians or resources are very busy.

The mark for the production process will be split in two:

- the extent to which the group keeps to the planned division of labour and works as a coherent group (as distinct from groups in which one person does all, or vice-versa, where everybody does a bit of everything) (20%).
- the extent to which the video itself is successful in embodying the marking criteria mentioned for the script, in regard to a/v communication, communication with the designated audience, communication that is critical vis-a-vis existing discourses, and finally, narrative structure. Again, each of these points will be given equal weight (20%)

5. Evaluating the video

After you have finished the production, you yourself will also be asked to participate in the evaluation of your own video in two ways.

On the one hand, we will have a conference in which we will critique (not to be confused with "criticize"!) each group's video.

On the other hand, each person will be submitting a written evaluation of the production, which briefly

analyzes in three separate sections,

- your own contribution to the group (including a description of your roles and functions in the group)
- the group dynamics (how well you worked as a group)
- the degree of success of the video in communicating its intended message to its designated audience, including the reasons why you think it was or wasn't successful.

This individual report will be worth 40% of the final production mark. It should demonstrate a capacity to evaluate each of the above points (your own contribution, group dynamics, and the video itself) with the relevant concepts, ideas, and/or critiques taught in the course throughout the year. Here are some examples of the kinds of things we will be looking for: explaining if and how the group dynamics and the video itself contest or (re)produce any discourse or ideology (eg. a sexist or racist discourse); if and how there is any instance of self-censorship; if and how the text failed to engage with its designated audience; if and how the dynamics of the production process got in the way of making a more ideologically critical video; if and how a certain textual feature of the video itself "framed" the issue in a way that was particularly critical, or uncritical of any discourse or ideology.

Individual reports which fail to demonstrate a working knowledge of the different concepts taught in the course (eg. discourse, ideology, etc.) will not get a passing mark.

Although this point may seem obvious, please do remember that you will also be marked on the basis of your capacity to take critical distance from your own work, and not on the basis of your capacity to laud your own group!

This report must be typewritten, double-spaced and must be no more than 1000 words. You must provide full references for any quotes or ideas which are not your own, in accordance with the guidelines provided in your essential papers.

Please note: You need to put the number of the production group you belong to on the title page of your assignment so that internal and external markers know what video production process you are evaluating.

6. Summary of marking criteria

The following, then, is a summary of the different things that will be taken into account in the marking of your entire final production:

Summary of criteria for marking final productions

A. Script: (20%)

1) Communicates in A/V language, with suitable narrative?

2) Shows evidence of attempting to communicate with designated audience?

3) Is ideologically critical vis-a-vis discourses/ideologies treated?

4) Follows conventions of scriptwriting, and includes all required explanations?

B. Group work (20%)

1) Group follows pre-established division of labour?

2) Group follows plans as far as possible, or modifies them in a manner that considers the implications for the overall narrative?

C. Video itself (20%)

1) Communicates in A/V language, with suitable narrative?

2) Attempts to communicate with designated audience?

3) Is ideologically critical vis-a-vis discourses/ideologies treated?

D. Individual report (40%)

1) Evidence of adequate individual participation?

2) Is there a critique of the group dynamics, which employs terms and theories taught in the course?

3) Is there a good critique of the video itself, which employs textual analysis to evaluate the video?

Bibliography

The following is a list of some of the texts that will be referred to in different parts of the course. Please note, though, that the central readings for the text will be the class notes, which will be distributed throughout the year. Each set of notes will offer a bibliography with recommended texts. You should read at least some of the recommended texts, as these will be primary sources which will help you to understand the different concepts and approaches used in the course.

Baker, S. (1993) Picturing the Beast. Manchester: Manchester University Press.

Barker, M. (1981) The New Racism. London: Junction Books.

Corner, J. (ed.) (1986) Documentary and the Mass Media. London: Edward Arnold.

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Crowther, B. (1994) "Towards a Feminist Critique of Wildlife Films" (manuscript).

Ellis, J. (1992) Visible Fictions: Cinema, Television, Video. (rev. edit.) London: Routledge.

Fiske, J. (1982) Introduction to Communication Studies. London: Methuen.

--- (1987) Television Culture. London: Methuen.

Gardner, C. & Young, R. (1981) "Science on T.V.: A Critique" in Bennett, T. et al. (eds) Popular Television and Film. London: BFI.

Hodge, R. & Kress, G. (1988) Social Semiotics. Cambridge: Polity Press.

--- (1993) Language as Ideology. (2nd. edit.) London: Routledge.

Myers, G. (1990) Writing Biology: Texts in the Social Construction of Scientific Knowledge. Madison: University of Wisconsin Press.

Silverstone, R. (1985) Framing Science: The Making of a BBC Documentary. London: BFI.

Tester, K. (1991) Animals and Society: The Humanity of Animal Rights. London: Routledge.

Thompson, J. B. (1990) Ideology and Modern Culture. Cambridge: Polity.

Turnstall, J. (1993) Television Producers. London: Routledge.

Williams, R. (1980) "Ideas of Nature" in Problems in Materialism and Culture. London: Verso, pp. 67-85.

Yorke, I. (1990) Basic Television Reporting Techniques. London: Focal Press.

Zettl, H. (1990) Sight Sound Motion: Applied Media Aesthetics. 2nd. edit. Belmont, CA: Wadsworth.

Appendix XII

Example of Concept-oriented Lecture

The following pages contain an example of what I describe in chapter three as a lecture organised along the lines of the concept-oriented modality. The pages show the information put up on OHP transparencies during the lecture. As I delivered the lecture, I 'punctuated' each point with the OHP. Before each lecture, I left a copy of these notes in the library, for photocopying by students. The example I have chosen recontextualizes some of the ideas of Scannel, P. (1991) "Public service broadcasting: the history of a concept" in C. Sparks & P. Dahlgren (Eds.) Communication and Citizenship, London: Routledge, pp. 11-28.

COMMUNICATING SCIENCE
"Public Service" as Discourse

The week before reading week...

*Popularization of science as recontextualization

*Recontextualization as part of mass communication

*Mass communication as institutionalized communication

This week...

*We will discuss the sense of "mission" that led the BBC and other media institutions to communicate about science: the idea of providing a "public service"

1. But what *is* "Public Service"? (A brief history based on the work of P. Scannel)

*The Victorian notion of service

*The need for the state to intervene in the distribution of a scarce resource

*The decision by the government to regard this scarce resource as a "public utility"

*John Reith, managing director of BBC (1927-1938).

*Reith: public service broadcasting should

*unite an otherwise scattered and fragmented public into a 'general public' (nation-building)

*provide universal access to all aspects of national life

*educate and "improve" this public by providing them with quality programming

*empower citizens to make democratic choices by informing them about all aspects of state decision-making

*BBC a monopoly meant to carry out the aims defined by Reith. This monopoly lasted for about 30 years.

*The rise of a "commercial" sector for T.V. in 1950's continued the "public service" mission.

3. Communicating Science as "Public Service"

The Reithian ideals are quite easily applicable to science communication:

*nation building: need to build nation through increased science & technology

*universal access: the "general public" should have access to science

*"quality" programming like "Horizon" series should improve public's understanding of scientific issues

*science programmes should inform public so that public can decide

4. "Public Service" as DISCOURSE

*The "idea" of public service is an example of a social discourse.

In this course, we will define discourse in a special way:

A discourse is a group of statements which provide a language for talking about-- i.e. a way of representing-- a particular kind of knowledge about a topic. (S. Hall)

*Discourses determine how we approach, understand, and relate to phenomena.

*Although discourses are expressed through language, they are also expressed through other forms of action: 'discursive practice'

*Discourses occur as groups of statements, each of which is linked to the other in what are called discursive formations

*Discourses are never absolutely "true", or "false": they are always "motivated" ways of representing phenomena

Appendix XIII

Example of Media-Analysis Lecture

The following pages contain an example of the content of what I describe in chapter three as a 'media analysis' modality of lecturing. The form is different from the lecture in that the following pages contain essay-like lecture notes, which were distributed to students on the day of the lecture. Even so, I have included this example (one of many similar lecture notes provided to students) because they provide a sense of the hierarchical, sequencing, and criterial rules with which I structured this modality of lecture.

COMMUNICATING ABOUT SCIENCE AND NATURE

Nature Naturalized

Lecture notes by Nils Lindahl Elliot
Communicating Science
BA (Hons) in Science, Communication and Culture

Introduction

In this brief lecture, and in the following ones, we will discuss social ideas of nature. We all think we know exactly what we're talking about when we use words like "nature", "natural", or even "unnatural". To use earlier terminology, we have naturalised ideas of nature, which we now think of as being, well, "natural". This chapter will denaturalise some of the ways in which we speak about nature, the natural, and the unnatural.

1. Ideas of nature as discourses about nature

It is easy to forget that our representations of the "nature of nature" are exactly that: representations. By means of symbolic forms-- words, images, statements, but in general, discourses-- we represent nature in culturally particular ways. Different cultures have different ways of representing nature. The Kogi Amerindians in South America, for example, have no general term to represent what we call "nature". While the symbolic form "nature" allows us to speak generally about all of the objects/phenomena which we regard as being part of what we call "nature", the Kogi represent each object/phenomena in terms of its individual attributes, and in terms of its relationships with specific "lesser" gods, and with their supreme god, the Great Mother of the Universe (note that their supreme deity is female, not male...).

To be sure, and as Raymond Williams (1980) has noted his brilliant essay "Ideas of Nature", the ways in which we ourselves have used the symbolic form "nature" have changed over the centuries. During the medieval era, for example, Williams notes

that God was "absolute first", and Nature "His minister and deputy". Centuries later, the idea that nature was the result of godly actions, indeed "God's deputy" came to be questioned with the rise of scientific discourses about the origin of the universe, and the evolution of natural phenomena. At that point, nature ceased being "God's deputy" and became an abstract, material force which was no longer thought of as an expression of godly intentions and motives-- at least not by those who suscribed to this new representation of the meaning of nature.

Why is this history important to us today? It is important because it historicizes and thereby denaturalizes our present ideas of nature. To historicize something is to show it to be the result of social-historical forces and actions, as different from being something which just "is" for no human, and social reason. What we say and what we "do" with nature-- what discourses we develop to speak about nature-- depends on a history of such discourses that have led to our present understandings of nature. This denaturalizes our present conceptions to the extent that it forces us to recognize that the ways in which we speak about nature are the product of culturally and socially bound discourses. They are not "natural".

Actually, the point just made begins to illustrate the social power of discourses about nature, and the natural. If we think that something is "natural", we tend to absolve any person, any institution, any concrete human action from responsibility for it. It thus makes sense that people and institutions might be tempted to brand certain phenomena as being "natural" to further their causes, and eventually, to dominate certain social groups who feel powerless to act because they think something is essential, unchanging, immutable, indeed, "natural". When this happens, discourses about nature serve ideological purposes.

2. An example of (institutional) discourses about nature and the natural: Clairol Loving Care.

The above argument might seem far-fetched, or abstract. Here then is an example of this very process at work in our everyday life.

In 1992/3, Clairol ran a 30-second television advertisement which told the following story:

Event 1: A woman discovers with horror that she has a gray hair.
Event 2: The woman tries to conceal it by putting on a hat, but this strategy fails: the gray hair reappears.
Event 3: Clairol appears on the scene with the solution: a hair dye
that removes unnaturally gray hairs.
Event 4: The woman dies her hair (although this is not shown) and emerges triumphantly, her problem solved (this is shown).
Event 5: She passes by another woman, who has just discovered, again with horror, that she has the same problem.

As described, this narrative may seem quite simple. In fact, the advertisement is extraordinarily complex. As is the case with any text, it (re)produces a number of culturally and socially embedded and inter-twined discourses, using a variety of subtly structured symbolic forms (shots, camera angles, statements, etc.). In this case, the discourses of most interest to us are discourses about female beauty, and thereby femininity; and discourses about nature. In this advert, these are inter-twined and mutually supportive.

The discourse on feminine beauty in this case is reproduced by a combination of a) all of the visual features exhibited by the model used for the advertisement-- young despite not being so young, "fresh", immaculately groomed, extraordinarily elegant, etc--; and b) by the story of which she is the protagonist. The story is a story about a beautiful woman (of course, the notion of the beautiful is itself culturally coded-- we will return to this in future lectures--) whose beauty is threatened by the appearance of a single gray hair. Although this is never explicitly stated, viewers socialized by dominant codes of feminine beauty instantly understand that the horror is due to the fact that the gray hair is a symbol of aging. And within Western culture, aging, particularly amongst women, is something which is viewed as a negative sign: aging-- and all of its signs-- must be suppressed "at all costs". This is in sharp contrast with other cultures, such as the Chinese, were aging is said to be a sign of wisdom, grace, durability...

The discourse of nature enters the scene most explicitly with the voice-over narration:

"When your gray hair becomes a handful, Shampoo in Clairol's Loving Care. With no peroxide or ammonia, it lasts up to 8 washes or for longer lasting colour there's Clairol's Lasting Colour. Both cover gray gently, returning your hair's natural colour. Giving (sic) your hair with a depth and shine that's outstanding. Not gray hair that stands out. "

When examined critically, this actually can be revealed to be an extraordinary statement, given the dominant discourses about nature which regard aging as a natural process, and which regard chemicals as being "unnatural" (Of course, are chemicals truly unnatural? Are they not produced with "natural" elements?). The advertisement implies that gray hairs are somehow unnatural, and that the chemicals in the hair dyes will restore the hair to its "natural condition". So the advertisement works by trying to invert the meanings normally promoted by dominant discourses about nature: use chemicals to be more natural.

This discursive inversion is intimately inter-twined with the discourse on beauty to the extent that the full discursive 'formula' can be described thus: to be beautiful is to be beautiful in the way that this woman is beautiful, that is, youthfully and "naturally" beautiful (perhaps too youthful for the presence of such hairs!). Such beauty can be lost unless you use Clairol to cover up unnaturally gray hairs.

The entire audio-visual narrative strategy works to (re)produce this discourse, which is quite widely used by the cosmetics industry. In this case, digital image synthesis techniques akin to those used in *Who Framed Roger Rabbit* are employed to "animate" a gray hair, and thereby to make the gray hair stand out "unnaturally" (of course a "natural" gray hair would never be this visible). Thus emphasized, this "horrendous" phenomenon is then given even more salience by the use of symbolic forms which themselves reproduce discourses of the natural, some of which are conflicting amongst themselves. The woman has brown hair-- a "natural" blonde would have undermined (paradoxically) the "natural" look-- and wears a brown dress. Even so her skin is very white-- why should it be?-- and stands out-- though not as much as the silver hair (!)-- when represented in the context of a domestic background of "natural" sepias and browns, and also a lot of greenery: domestic foliage, "nature" brought into the household.

A full textual analysis would need to explore a number of other aspects further. We would want to explore the camera angles and montages, to then ask why they are used. One reading

of these is that the shots and montage invite the viewer to assume a paradoxical attitude of undetected, "peeping" observation, but at the same time of horrified identification with the woman: of watching it happen to someone else, from above, from partially closed doorways, from "behind" a two-way mirror, but also of imagining it happening it to oneself. We would also need to question the angles in which the products appear in the advert, and finally, we would need to explore the potential significance of the closing scene, in which another woman begins the cycle all over again. For the present purposes, however, it suffices to explain that an institution (the producer of Clairol Loving Care) has defined "nature" and the "natural" in ways which suit its (ideological) purposes. This is dissimulated (cf. previous lecture) by means of the ideological inversion mentioned earlier.

3. Conclusion

Examples like these should lead us to question the ways in which nature is represented in our culture. What is being defined as "natural", and what is being treated as "unnatural", by which institutions, and for what purposes? It is easy to forget that humans reproducing the values and discourses of particular cultures and institutions do the defining. To be sure, there is a long and tragic history whereby discourses about nature, the natural, and the unnatural have been used to justify the domination, exploitation, and at times even the elimination of certain social groups. When this has happened-- when, for example, women have been told that they should stay at home because they are "naturally" suited for domestic chores; or when capitalism has been justified on the grounds that it is a more "natural" economic system-- nature has been molded to serve ideological purposes. Part of what has made such discourses so powerful is that they have been attributed not to particular men or women, not to particular institutions or cultures, but rather, to nature "itself". In the following lecture we will examine another example of this process at work when we analyze natural history documentaries.

References: Evernden, N. (1992) The Social Creation of Nature. London: Johns Hopkins Press. Williams, R. (1980) "Ideas of nature" in Problems in Materialism and Culture. London: Verso, pp. 67-85.