Disciplinary Cultures and Social Reproduction

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'Culture' has in recent years again become a favourite concept in the sociology of science and of higher education. It seems that a starting signal was given by what is known as the micro-sociological or ethnographical approach to 'social studies of science' (e.g. Latour & Woolgar, 1979; Knorr-Cetina, 1981; Knorr-Cetina & Mulkay, 1983; Lynch, Livingstone & Garfinkel, 1983; Woolgar, 1988): research even in the hard pure natural sciences was seen as a social process of production or rather construction of knowledge embedded in a 'laboratory life' which could best be described as a 'culture'. Then American sociologists of higher education adopted the term in order to describe the diversity of higher education institutions in the USA, perhaps most notably the monumental work on 'academic life' by Clark (1987) and the many publications listed in the report *The Invisible Tapestry* by Kuh & Witt (1988). Lastly, the 'disciplinary cultures' attracted the attention above all of European writers (e.g. Becher, 1981, 1987a, b; Liebau & Huber, 1985; Apel, 1987, 1989; Projekt Studium, 1988).

It would certainly be worth pondering what the reasons are for the attraction of this approach and its connections with similar preferences in other spheres, for instance for organisational culture, corporate culture (or identity), professional culture or sociology of culture in general (cf. Soeffner, 1988; Haller *et al.*, 1989), but this question is too complex to be answered here *en passant*.

My own interest in disciplinary 'cultures' arose from a concern with socialisation and personal development in or through higher education, especially in its disciplinary refractions. Any one-to-one correlation between individual 'input' and 'output' variables had of course proved unsatisfactory for many reasons; the concepts of 'environment' in the tradition of the College and University Environment Scales and its successors remained behaviourist in character, while the interactionistic focus on personal (or moral or identity) development seemed to be somewhat blind or highly selective as regards the institutional or wider context. 'Culture' then offered itself as a concept sufficiently wide and complex to cover all the relevant traits from everyday life to cognitive and social structures in the disciplines, and it is almost 'naturally' linked to a concept of socialisation as the development of basic dispositions to act which are specific for a given group, produced in and reproducing its culture, i.e. of a disciplinary *habitus* in the sense proposed by Bourdieu (see below). Both things make 'culture' preferable, in my view, to that much-loved concept of (social) 'system' which seems to seduce its adherents (e.g. Klüver, 1983, 1988, 1989) into restructuring the complex whole of university or discipline life based exclusively on the production of knowledge, neglecting the interaction with other systems (most of all that of educa-

tion) and the many historical traditions which make these worlds so complicated and fascinating—just like cultures (for a less summary critique, see Huber, 1990).

But where there is fascination there is also temptation. Undoubtedly, viewing disciplines as cultures has produced a wealth of observations as to how different these 'small worlds' are. As remarked in the editorial of this issue, and as may be confirmed by even a quick glance at Becher's book (1989), disciplines differ in many ways. Taken as environments for teaching and learning organised in departments, differences have been shown in teachers' interest and involvement in teaching, students' goals and aims, learning strategies, satisfaction with instruction, structure of the subject matter, educational code of the curriculum, grading system and procedure, relationship between teacher and students or colleagues, density of contact, etc. (e.g. Winteler's review (1981) of a dozen out of many studies; Gleich *et al.*, 1982; Dippelhofer-Stiem, 1983; Entwistle & Ramsden, 1983; Huber, 1990; and, most important for the theoretical side, Bernstein, 1977). Looking at them more broadly as academic institutions, Clark (1987) confirms the familiar perception that there is a wide range of variation in teaching load and orientation; in the role and type of research, as well as the resources required and available for it; in the amount of practical work and its importance; and in the involvement in administration/self-governance and the cosmopolitan versus local orientation that accompanies these other aspects. Yet beyond these familiar dimensions, disciplines are different as *ethnoi*. This perspective is developed in Becher's illuminating book (1989): he shows that academic 'tribes', like others, have their traditions and taboos, their territories and boundaries, their fields of competition and their pecking orders within and between them, their tacit knowledge and hidden assumptions, and their specific patterns of communication, publication, division of labour, hierarchies and careers.

The temptation I can see here is of willingly or unwillingly becoming immersed in an ever more detailed, ever more colourful description of the world of disciplinary cultures in its rich, almost endless variation. The 'small worlds' within academia then offer such a multitude of interesting or strange, pleasing or horrible traits, intriguing similarities and contrasts that the task of the observer comes to resemble that of a biologist who studies the morphology of organisms and is most concerned with establishing a taxonomy. Such taxonomies—Becher's book contains excellent examples—serve as a useful tool for the observation, description and classification of the manifold phenomena. However, the same concept of culture that is such an efficient eye-opener for research (and learning) as a social process, then entails the danger of looking at this social process only within the disciplines or at most the academic cosmos as if it were a self-sufficient and self-explanatory cycle. In such a perspective the epistemological characteristics of the domains of knowledge are seen as the causes of the disciplinary cultures which cultivate them, and influences from a wider social context are treated rather as subsidiary variables. The books by Becher (1989, ch. 7) and more so Clark (1987) are examples of this, too.

This is where I wish to raise some doubts. It is, I think, extremely helpful to identify patterns like Bernstein's 'collection versus integration' code in the teaching/learning arrangements or Becher's 'hard/pure to soft/applied' matrix in the realm of research, and to discover many other traits of the culture from the hierarchies and division of labour down to the conventions of communication and publication clustered around them. But, first, why are the patterns the way they are? Does the subject alone really dictate whether the knowledge communities are convergent/tightly knit or divergent/loosely knit in their work, urban or rural in outlook, etc.? Are not the

patterns themselves the result of a history in which a major part was played by the use (in the broadest sense of the word) that society made (and wished to make) of inventions relevant to controlling or changing their world and communicable interpretations for understanding it (cf. the distinction of interests guiding knowledge made by Habermas, 1989)?

My second objection is that there are traits associated with the disciplinary cultures which cannot plausibly be connected only with the epistemological characteristics of the knowledge domains.

In the first place, in addition to all the other differences identified, disciplinary communities also differ in the *attitudes to political and social issues*. Surveys on academics or university teachers [1] always show that their stance is more liberal or to the Left than that of the average citizen, but within academia they tend to reproduce the same rank order from Left to Right, 'progressive' or 'liberal' to 'conservative': people in the social sciences are farthest to the Left, followed by those in most of the humanities (less so in modern languages and sometimes history); natural sciences fall in the middle (physics more to the Left than chemistry); medicine and particularly engineering tend to the Right. This appears to be true over time and across national borders (cf. Halsey & Trow, 1971, p. 432; Bourdieu, 1984, pp. 93 ff.; Ladd & Lipset, 1975, p. 60; Institut für Demoskopie as analysed by Naumann, 1986; smaller scale studies by Meusburger, 1986; Pross *et al.*, 1970). In my view, the reasons for these repeated findings must be sought in the place or function academics have in the social order. If the subject is all-important: why the differences between sociology and economics, or between psychology and medicine, or between physics and chemistry? And why, then, one of the few major differences to emerge in international comparison: law? Law appears at the Right of the spectrum in Europe, especially France and Germany, but rather on the liberal wing in the USA—a phenomenon which can only be explained by the close involvement of lawyers in all state and administrative functions in (particularly continental) Europe as compared with the more freelance character of their profession in the United States.

Moreover, the discipinary communities also differ in some *cultural practices and preferences in the private lives* of their members. Bourdieu (1984, pp. 93 ff.) found for the professoriate at universities in Paris in the 1960s that in the disciplines on the liberal Left wing of his spectrum—humanities and theoretical natural sciences—there were relatively more Protestants (in France!), more Jews, more people separated or divorced, with fewer children, more who lived in either typically academic (Latin Quarter) or average urban neighbourhoods, fewer who were inclined to accept state commissions for research, seats on public committees, public ceremonies and honours. On the Right wing—medicine and law—he found almost the opposite. Ladd & Lipset (1975, pp. 345 ff.) found comparable traits, e.g. frequent concert-goers among those in fine arts, far fewer in engineering, business administration, agriculture, botany and so on, but more frequent participation in sports events in the field and in education; frequent attendance at religious services was particularly rare among social psychologists, anthropologists, lawyers, sociologists, historians, philologists and physicists. For Becher 1989, p. 106) "it was, for example, apparent from the incidental remarks they made that the physicists were inclined towards an interest in the theatre, art and music, whereas the engineers' typical leisure activities included aviation, deep-sea diving and 'messing about in boats'". One would have to know more about the religious denominations or the kind of sports in the case of the Ladd & Lipset study and more about the kind of theatre, art, music in all cases in order to confirm the hypothesis put

forward by Bourdieu (*loc. cit.*), that the underlying patterns are a *principe de 'distanciation'* in the one case and a *'goût de l'ordre'* in the other. But it seems clear that again differences cannot be derived just from the subject, but are to be attributed to the cultural capital people bring with them. This leads me to my third point.

The disciplinary communities are also different in terms of the *social background* of its members. In general, of course, the professoriate is mainly middle class. However, judged by the socio-economic status or the educational attainment of their parents, professors of medicine, closely followed by those in law (or vice versa), have always been and still are the most upper class; humanities are a mixture; parts of the natural sciences, followed by the social sciences, recruit more from lower social classes; engineering is definitely at the low end (Halsey & Trow, 1971, p. 431; Bourdieu, 1984, p. 66; Ladd & Lipset, 1975, pp. 88 ff.; Meusburger, 1986; Buchhofer *et al.*, 1981). A certain levelling may take place, but recent surveys on junior staff in Germany show that even if distances are smaller there is still the same rank order between the disciplines (cf. Holtkamp *et al.*, 1986; Over, 1985). It must be social factors that attract certain social groups more than others. In turn, if social groups, bringing their specific *habitus* with them, are differently represented in the fields, one would have to look for the impact this may have upon the disciplinary cultures.

This view does not, however, seem popular. It is explicitly condemned as irrelevant by Clark in a passage worth quoting for its forthright language:

> Sociologists who concentrate on characteristics imported into the academic profession by individual members from their personal background and prior experiences have been essentially looking at the least important components of academic culture (1987, p. 107).

Clark argues against my first point that "political preferences that come from external commitments and from an overlay of political parties . . . have at best a minor role", and with regard to my other two points that "by the time young academics are committed to a discipline and embedded in an institutional setting, the beliefs and identities they import from their social class background also fade" (ibid.)—but he does not provide any evidence. This, I would say, is essentially how academics would like to think of themselves. Becher, although less outspoken, seems to share this view in so far as he does not deal with political attitudes at all, treates the cultural preferences and practices as private or, quoting Kolb, "peripheral" (1989, p. 106), and starts his account of recruitment to the disciplines with the postgraduate stage without mentioning social background or the like. Are the academic disciplines thus autonomous spheres, not really affected by external commitments and do they eradicate the social identities of their members? Against this view I would argue that the cultures of the disciplines, although (or just because) they enjoy a relative autonomy, cannot be understood without taking into account their relative positions in social space.

Disciplines in Social Space: external relations

Indicators helpful in locating disciplines in social space could perhaps include the following.

The first is the *personal income* of university teachers in a given discipline relative to those in others. In the Federal Republic, for instance, while the average salary of professors, lecturers, etc. is fixed according to formal rank and seniority and is the same across disciplines, the actual individual income may vary to a large extent

depending on opportunties to earn extra money through professional practice or through commissioned research. These opportunities, no doubt, differ not only according to personal ability and status (credentials) already achieved, but also according to disciplines. Disciplines which allow or even expect academics to practise as professionals at the same time—i.e. as medical doctor, therapist, lawyer, expert, counsellor or even journalist—offer substantial advantages in this respect; so do those whose members may run an office or enterprise alongside their academic job, e.g. in architecture, engineering or, nowadays, certain branches of biochemistry or biotechnology. Commissioned research, more frequent in the natural sciences, engineering or medicine than in economics, social sciences or education, may not necessarily increase the individual income directly, but may bring with it fringe benefits such as assistant staff, travel funds or the like. Exact figures for individual incomes of university teachers by discipline are not available, as far as I know, but for Germany it is safe to say that professors in clinical medicine may earn, on average, three to five times more than their colleagues in the humanities or social sciences who mostly have to rely solely upon their state salary, and that between these extremes there rank lawyers, economists (or rather those in business administration), and engineers or chemists. The effect is twofold: academics with external links act outside their discipline in one or more other fields or frames of reference, relating to and competing with professionals who are not professors, and probably tend to bring about an equivalence between their positions in both. And within their disciplines, a second prestige order besides the academic one is generated, which is not totally independent but not congruent either. Here not only the amount of additional income but also the character of the activity—profession in the classical sense of the word, or commissioned work—makes a difference regarding social status.

Another indicator is the amount and the sources of *additional research funds* allocated to members of different disciplines. There are, of course, great disparities in the basic equipment needed for research and even teaching, for instance in engineering and the natural sciences, compared with the humanities, and which is therefore supplied by the universities [2]. These budgets in Germany cover roughly two-thirds of the research and development expenditures of universities (and *Fachhochschulen*). They probably indicate—as do the funds that can be raised from other sources (in German: 'Drittmittel')—not only what research in the disciplines currently costs, but also hint at what society is willing to pay for a discipline's contributions and how useful it is thought to be. For the largest *Land*, Nordrhein-Westfalen, the distribution of 'Drittmittel' of all sorts among the disciplines compared with staffing levels is shown in Table I. The table clearly shows that staff in engineering or natural sciences, although they account for only 17 or 22% respectively of total numbers, receive 40% and 30% respectively of the additional funds. Actual figures may be still higher as not all additional funds are reported, especially not those from private sources. The proportions in medicine are misleading, as the figures include staff who often work mainly in hospital. The picture would become even sharper if only the senior professors or chairholders (*ordinarii*) were considered since they receive two-thirds of all additional funds (cf. Wissenschaftsrat, 1988, p. 40).

Nevertheless the general picture is probably correct. It is confirmed by the distribution of the single most important source of additional public money, the Deutsche Forschungsgemeinschaft (DFG). And it has its reciprocal in the staff–student ratio: where more external additional funds are available, the numbers of students to be taken care of are smaller (Table II).

TABLE I. Additional research funds (*Drittmittel*) allocated to higher education institutions in Nordrhein-Westfalen (million DM) compared with national distribution of academic staff by discipline, 1984

Discipline	*Drittmittel*	Percentage share	National distribution of academic staff (%)
Humanities	31.3	7.6	19.2
Law, economics, social sciences	16.1	3.9	12.5
Natural sciences	119.3	29.1	22.3
Physics	*40.9*	*9.8*	
Chemistry	*19.7*	*4.8*	
Biology	*40.9*	*9.8*	
Medicine	70.1	17.1	22.1
Agriculture, forestry, nutrition	5.5	1.3	2.5
Engineering	167.7	40.9	17.2
Civil	*19.4*	*4.7*	
Mechanical	*69.8*	*4.7*	
Electrical	*22.8*	5.6	
Total	409.8	100	100

Source: Wissenschaftsrat (1988, pp. 37 ff.); BMBW (1987, p. 199).

Is it nowadays too daring to assume that the full duties of a professional job or substantial additional research funds must create and demand a certain attitude for the clientele to be served as well as a certain loyalty to the social structures which make it possible to earn extra status and income along with the professorship? Especially if teaching loads and numbers of students to be looked after are clearly smaller? This is not to parrot phrases like 'slaves of capital' nor to suspect that these academics could not do independent research. What is meant, however, is that these disciplines compared with the more theoretical social sciences and especially the humanities have stronger links with and more interests invested in the outside world. The frames of reference go beyond the boundaries of the disciplines or of knowledge altogether: the academic communities have become 'hybrid' (cf. Daele *et al.*, 1977), their networks include the administrative, medical and business worlds (cf. Whitley, 1984). The same

TABLE II. Number of students per full-time academic staff at German universities, 1985

Field	Students per head
Social sciences, law, economics	31.9
Fine arts	21.2
Humanities	20.4
Agriculture, nutrition	12.6
Engineering	11.1
Mathematics, natural sciences	9.6
Medicine (including veterinary)	5.1

Source: BMBW (1987, pp. 142–143 and 198–199) (author's calculations).

critique which warned the micro-sociological approach to laboratory life not to take these cultures as self-contained (cf. Weingart, 1982) also concerns the ethnography of disciplinary cultures. Becher (1989), who devotes a chapter to these issues, is anxious to affirm that such external influences do not affect the criteria for truth and for quality of research as established in the disciplinary culture; but, if as they probably do, they influence the selection of topics, definition of problems and forms of publication, this is testimony enough to the place of disciplines in social space.

Bourdieu's Model of Social Space

These observations have already been guided implicitly by criteria drawn from the model of social space which Pierre Bourdieu has developed in order to reconstruct the process of social reproduction; it ought to be made explicit here (see Bourdieu, 1975, 1982, 1984, 1985, 1987).

Bourdieu's social theory belongs to the tradition of theories of social reproduction like that of Marx as opposed to those of actions or systems. Unlike Marx, he sees the structures of society as not totally and not directly determined by their economic structures, and consequently the process of reproduction of social structures as driven not only by capital in the purely economic sense. Instead he distinguishes four kinds of 'capital' (or 'resources') which any individual may possess [3]:

(i) economic capital: wealth (indicated by financial resources) and/or possession of means of production, institutionalised by law in ownership of property, easily transformed into the other sorts of capital;

(ii) social capital: social relations and influence, revealed in networks and institutionalised in status, professions, hierarchies;

(iii) cultural capital: knowledge in the broadest sense (general education, special (professional) qualifications, taste); also indicated by possession of books, works of art, etc., institutionalised by the educational system in titles and qualifications which under certain conditions can be transformed into other sorts of capital;

(iv) symbolic capital: individual prestige, brought about by higher levels of the three other kinds of capital (especially economic capital) *and* personal characteristics (e.g. charisma), manifested in authority and credibility and highly apt to be re-transformed into economic and social capital [4].

The position of any member of society is determined not only by the absolute volume of his or her capital but also by its composition relative to that of other members (in a synchronic or horizontal perspective) and by its history: the social rise or fall of the individual, family or group (in a diachronic or vertical perspective). To enhance or at least to keep their status, individuals have to make the best use possible of their capital and to win advantages over others: rational investment and competition do not belong to the economic sphere alone.

This takes place in different *fields* structuring social space and themselves dominated by one of the types of capital or a certain combination of them, with economic capital underlying all of them and symbolic capital mediating the transfer across all of them. 'Field' may be understood as field of force, as battle field or playing field: it is always made up of actors complying with its framework and rules, holding or, if they can, changing positions which can only be described by their relation to (and be changed in reference to) the other positions within the same field, and competing for more of the capital or related values at stake in that particular field. Equivalences may exist between positions in the fields of politics, economics, religion, arts, intellectual

life or the sciences. The petit bourgeois striving upwards in the social field or the research entrepreneur in the economic field may find himself in an equivalent position to others in the academic field. But in order to pursue one's game in another field, one must abide by the rules in force there: for example, it is neither decent nor therefore possible to compete for economic capital directly and openly within the academic field—the game there is about cultural capital and especially academic prestige. (This is the way the 'external links' mentioned above work within the academic community.)

It should be pointed out that, in spite of the terms used, individuals act as they do only in part consciously and directly in response to goals. Born into certain fields and then initiated into others, and finding themselves in certain positions surrounded by clusters (groups) of people sharing this situation, people somehow grasp how the game works, learn by doing and incorporate the generating schemes very much as a child learns its mother tongue and patterns of social behaviour, i.e. a practical competence (*'le sens pratique'*, a feel for the game) without knowing the rules or consciously complying with them. Thus a correspondence—not determination—is at work between the *field* (the structures in which the history of a society has become institutionalised) and the *habitus* (the actors' dispositions in which the same history has been incorporated): they produce and structure one another and are reproduced and structured by one another.

Now we come back to the positions of the disciplines in social space. Not only must positions within the fields be defined in relation to the other positions, but so also must the fields themselves in relation to other fields. Depending upon the choice of perspective, positions within one field must be described in relation to adjacent fields as well. Within the *political* field, in the game about power, actors with substantial economic capital, close links with the field of economics, are in a dominant position; actors holding less of this and more cultural capital form the dominated element—their role is therefore to take a sceptical view of the values and structures prevailing in this area. Within the *cultural* field (in the broadest sense), actors holding considerable economic or social capital may still be in a good position in so far as they can transform it into expensive education or ownership of precious things etc. But by doing so they acknowledge, perhaps with scepticism or resistance, that this is another game, dominated by cultural resources which artists and academics (in the broadest sense of the word) primarily boast of having.

This relationship is repeated in the sub-fields of the cultural field, for instance in the academic field (Bourdieu's *le champs scientifique*) with its disciplines or, to use the fitting spatial metaphor, 'departments'. Across the whole spectrum, the disciplines that positively contribute to the reproduction of the structures in, and keep close links with, either the economic or the political field or both and which in exchange command relatively more wealth or influence are also in a good position within the academic field, but are nevertheless opposed to and relatively devalued when it comes to the proper rules of this game, to criteria such as 'pure' (versus applied) 'disinterested' (versus interested or commissioned), or fundamental, general, holistic etc. (versus situational, particular, atomistic, etc.). There the strongest positions are claimed by the humanities in general, philosophy and history in particular, against the sciences in general, engineering in particular.

This game is repeated within the groups of disciplines and even within the individual disciplines. The actors who represent the more practical or applied discipline or sub-discipline and who have stronger links and better standing outside the

field, who get more funds and make more money, may be envied in some, but are devalued for the same reason by the actors who stand for the more theoretical and pure work and defend the true academic values: philosophy versus education, history versus sociology, physics versus chemistry, natural sciences versus engineering, but also philosophy of education versus physical education or teaching foreign languages, social theory versus industrial sociology, economics versus business administration, theoretical versus experimental physics, theoretical versus clinical medicine, and so on. Here, always in the theoretically more ambitious, economically less profitable subjects, are the real priests of academia, more frequently honoured with academic awards and more frequently represented and active in leading positions and governing bodies of their institutions and associations than the others. In order to do this they have to stress the distance of their position and the difference of their field as against the economic or political field, and fight for the symbolic value of their particular academic capital. This is indeed part of the game in all fields: the battle is not only a real one for increasing one's capital of one sort or another, it is also a symbolic one for keeping up or enhancing the value of the particular kind of capital one has vested interests in. For the same reasons, then, the 'practitioners' and 'applicants' have to defend their position, e.g. by propagating economic growth, practical usefulness, social relevance and the like as criteria for 'modern' or 'progressive' academic work. In this game any objective or subjective differences, in resources as well as in preferences (problem definitions, methods, taste) at the same time serve as social distinctions, by which the positions and their relations (distances) to others are marked (cf. Frank, 1989). Knowledge claims are at the same time status claims.

This will have a familiar ring to those who are used to listening to debates in academic senates, students' assemblies or funding committees about claims to greater appreciation and resources for the humanities or the technological sciences, pure or applied research, the theory-oriented or practice-oriented parts of the curriculum in turn. But it also fits the stereotypes by which Becher's interviewees tended to mark the places of other disciplines in relation to their own, and to what he derives from that for the academic pecking order. However, this is not, as again Bourdieu has pointed out (1984), a phenomenon of our times. He refers us to Kant, who in his witty essay 'The Contest of the Disciplines ('Der Streit der Fakultäten') of 1798, revealed just such a dual pattern of the positions of 'Fakultäten' in his time: if the competing claims of the faculties are judged by their relevance for or contributions to the state, to keeping up divine and mundane order, public wealth and health, then the rank order is:

theology—law—medicine—philosophy (including humanities and natural sciences)

If, however, judged by relevance for or contributions to the intellectual discourse, to developing rationality, it is the reverse:

philosophy—medicine—law—theology

Kant, imagining the disciplines as sitting in a parliament of reason, sees the Faculty of Philosophy as sitting on the left wing and arguing in Left-wing terms, i.e. critically, while the traditionally so-called 'higher' faculties sit on the right side and argue in Right-wing ways, i.e. conservatively. They all do their job, but in doing so they are in permanent conflict about their place in an internal or external rank order. It is in this context that within and between the disciplines the contest goes on, not only about which knowledge is harder and purer, but also about whether these criteria themselves are legitimate. It is in this competition about distinction in their social field that the academic behaviour, so well illustrated by what disciplines say about one another in

Becher's interviews, develops, which otherwise would seem in a mysterious way to stem from the cognitive characteristics of the subjects themselves. And it is related to the place of a discipline being near to or distant from the political and/or economic field whether the attitudes and activities of its members conform with or oppose the existing social structures, which otherwise would seem to be sheer chance or irrelevant.

The Position of the Disciplines in Strategies of Reproduction of Social Status

So far the argument has been that the differences between disciplinary cultures are associated with the differing positions disciplines take in relation to the economic and political field and relative to other disciplines within the academic one, and their particular role in the reproduction of the social structure. If this attempt at a social topography of the disciplines is right, it should also be reflected in the choices which students make between them, as well as perhaps in the reasons they give for their choice. Different social input again should have an impact upon disciplinary cultures. An examination of this question, however, means extending the notion of disciplinary culture so as to include the students, because for the problem of socialisation this is the most interesting aspect and because the recruitment to the disciplines begins with them.

Recruitment

Differences between the disciplines or fields of study regarding gender and social background are still considerable in Germany and probably elsewhere, in spite of claims of 'democratisation' or 'levelling' of educational opportunities and careers [5].

One of the most recent representative social surveys on students in higher education in the Federal Republic, the eleventh Sozialerhebung des Deutschen Studentenwerks of 1985, on the basis of about 20,000 questionnaires (39% response rate) produced the results summarised in Table III [6].

In this survey, 'social background' is a variable in which parents' professional position *and* educational level (the highest, whether father's or mother's) are com-

TABLE III. Students at German universities by disciplinary groups and social background, 1982 and 1985

	Background (%)							
	low		middle		upper		high	
Discipline	1982	1985	1982	1985	1982	1985	1982	1985
Engineering	12	12	10	10	10	11	10	10
Humanities	23	23	24	24	25	26	23	25
Mathematics, natural sciences	22	23	22	22	18	20	18	19
Medicine	7	7	8	8	10	9	17	17
Law, economics	18	18	18	20	22	22	21	21
Social sciences, psychology, education	18	17	16	16	15	12	10	8
Total	100	100	100	100	100	100	100	100
(numbers)	(3873)	(2686)	(6155)	(4621)	(4884)	(3825)	(3551)	(3667)

Source: Schnitzer *et al.* (1986, p. 369).

bined. It appears that among students from disadvantaged backgrounds, relatively more choose engineering, mathematics or natural sciences and above all social sciences, psychology or education, while relatively fewer choose law, economics and least of all medicine than do those from the highest and high social classes; the humanities are also slightly more often chosen by students from the latter groups.

TABLE IV. Students at German universities by disciplinary groups and father's job, 1985

	Father's job (%)				
Discipline	manual worker	non-manual employee	civil servant	self-employed	Total
Engineering	18	42	21	19	100
Humanities	15	39	28	18	100
Mathematics, natural sciences	17	41	24	19	100
Medicine	14	38	23	25	100
Law, economics	20	39	24	18	100
Social sciences, psychology, education	10	36	29	24	100
Total (expected value)	16	39	25	20	100
(numbers)	(2238)	(5632)	(3593)	(2918)	(14,380)

Source: Schnitzer *et al.* (1986, p. 379).

The next two tables, from the same survey, show how as a result of this self-selection the different social groups are represented in the various fields, 'social background' this time broken down by father's job and father's highest qualification (Tables IV–V). Rough as the classifications in Table IV are, it is clear that while the bulk of students' fathers hold middle positions as employees or civil servants, there are (almost) twice as many children from working-class backgrounds (i.e. a fifth, a substantial proportion) in engineering or social sciences as in medicine. A quarter of the students in medicine and law and economics come from the group called self-employed, suggesting that the liberal professions still tend to reproduce themselves.

TABLE V. Students at German universities by disciplinary groups and father's educational qualifications, 1985

			Secondary school				
	University	Technical college	*Gymnasium*	other upper	lower	None or unknown	Total
Engineering	26	10	5	14	43	2	100
Humanities	31	7	6	16	37	3	100
Mathematics, natural sciences	24	8	6	16	41	3	100
Medicine	44	7	6	12	29	2	100
Law, economics	28	7	7	19	37	2	100
Social sciences, psychology, education	20	8	6	19	45	2	100
Total (expected value)	29	8	6	16	37	3	100
(numbers)	(4212)	(1137)	(903)	(2397)	(5688)	(386)	(14,722)

Source: Schnitzer *et al.* (1986, p. 382).

These profiles become even sharper in Table V. If one takes professional position as indicating Bourdieu's economic/social capital and educational level as indicating the cultural capital of the parental family, then medicine emerges even more prominently as the primary field to re-invest cultural capital, followed at a distance by (interestingly enough) first humanities and then again law and economics; by contrast, around 45% of the students in social sciences, engineering and natural sciences start with least cultural capital, their fathers holding the lowest educational qualifications.

The picture would become even clearer if, as in other surveys (e.g. Reissert, 1980, p. 31), students registered in teacher training (mostly integrated into the university system in Germany) were shown separately: as this has always been a path for the upwardly mobile (and for women), the remainder of the student body in the humanities would appear as more upper class in origin. Similarly, if students in law are separated from those in economics/business administration, law turns out to be the other high status profession next to medicine.

The same distinction also appears in another more recent survey on about 7700 students in 1984/85. Table VI contrasts only the extremes: children of academics versus working-class children, but adds other interesting information. The same field that is 'lowest' with regard to the social background of its students—social sciences and psychology—attracts the highest percentage of women, of students having vocational training before passing the *Abitur* (general certificate of education giving access to universities), of students transferring from other subjects and, consequently, of older than average students. It seems to be a sort of collecting pool for students with difficulties of access and winding career paths due to low economic and cultural (academic) starting capital.

Smaller scale studies generally confirm the emerging picture (e.g. Apel, 1987, 1989, comparing students of law and education; 1990 adding engineering). Preisser (1989a) in a study based on the statistics of both the Free and the Technical Universities of Berlin (*ca.* 65,000 students) has a graph demonstrating a remarkably steady rank order of individual disciplines from a low to higher proportion of students whose fathers have jobs requiring at least the *Abitur*, and another rank order according to percentage of students from working-class backgrounds in exactly the opposite direction. Since it examines individual disciplines, it also shows the differences which (not unexpectedly) within the disciplinary groups separate, for instance, Latin literature or history of art from English or German literature, ethnography from sociology, biochemistry or geology from biology or geography, etc.: in general those requiring more cultural capital or longer studies and therefore higher investment.

To sum up, I would argue that these data (which could be extended almost indefinitely) suggest that considerable differences in the social composition of the student population by discipline or group of disciplines continue to exist. As there is no formal selection to the fields using social background as a criterion, they are the result of self-selection (or rather self-elimination). The epistemological characteristics of the subjects as such could (perhaps) explain why they attract certain personality types, but not why students from a certain social background feel more drawn than others. It must therefore be a combination of social factors which affects the choices students make: such reasons as the status perspectives, the social careers opened or facilitated in certain fields, and the opportunities to profitably invest and make use of one's specific capital within these fields.

Choosing which subjects to study is a complex process. Students may be indecisive until just before registration, but even so they have ruled out many alternatives long

TABLE VI. Students of German universities by disciplinary groups and 'social profile', 1984/85 (in percentages)

	Humanities	Social science, psychology	Law	Economics	Medicine	Mathematics, natural science	Engineering	Total
Women	56	57	37	24	38	29	10	36
Background								
Academic	27	19	31	19	36	24	21	25
Working class	12	18	10	14	10	18	18	14
Occupational experience/training								
before *Abitur*	7	18	6	10	8	6	12	9
after *Abitur*	5	6	9	16	10	3	4	7
other	4	9	3	4	10	4	3	5
total	16	33	18	30	28	13	19	21
Study career								
transfer from other subject	21	26	8	15	18	12	10	15
mature student	18	33	16	22	30	13	17	9
graduate	9	9	8	5	7	12	11	9
total	13	18	7	6	6	8	6	10
Average age	24.8	26.3	24.2	23.6	25.0	23.8	23.9	24.5
(Total number)	(1583)	(698)	(737)	(991)	(857)	(1498)	(1070)	(7663)

Source: Peisert *et al.* (1988, p. 75).

before. For, more often that not, their choice is less a positive selection of this and no other discipline than a successive exclusion of alternatives 'which are not for me' (cf. e.g. Bürmann, 1979). Not necessarily consciously and by no means always on the basis of complete and correct information about the target professions or the fields of study, students and their families assess the probability of success with regard to their aims later on and the economic, social and cultural capital needed on the way. Their perception of these capital requirements depends on their cultural milieu, language, general education, taste and competence they feel they have. This capital is in any case not identical simply with the individual's achievement in corresponding subjects at school, important as that may be: access to medicine, for example, is limited by a strict *numerus clausus* in Germany and open only to students graduating from the *Gymnasium* with the top grades, and promises (at least in recent decades) rewarding work, high income and status; nevertheless among the students fulfilling the requirements, significantly fewer from poor social backgrounds actually dared to follow this route (cf. Schnitzer *et al.*, 1983, p. 52; 1986, p. 376). This is quite consistent with general theories on the process of selection in education: that it is to a great extent *a process of self-elimination* which does not (or at least not only) depend upon individuals' actual achievements at school (cf. Saint-Martin, 1968; Bourdieu & Passeron, 1971; Boudon, 1973; Böttcher, 1985; Engel & Hurrelmann, 1987).

Both elements of the assumption can be corroborated in answering two frequently asked questions.

First, are there not important differences by gender? There are, but they generally fit into the picture. Women's career chances are still poorer than men's, girls from poor social backgrounds are even more hesitant than the boys to risk studying at the university, to disregard the adverse social stereotypes of their milieu and the lack of positive role models (girls from the higher social classes are three times more likely to study at university). If they study they tend, like female students in general, to choose the humanities (one third), but also—twice as often (24%) as the more advantaged girls—sociology, psychology and education (despite the diminishing role of teacher training). Unlike the men, lower class girls do not opt more for mathematics or natural sciences, and are only half as well represented in medicine (7% as against 16%); they are even less likely (3%) to intrude into the male domain of engineering (Schnitzer *et al.*, 1986, pp. 108 ff., 368 ff.). A breakdown of data by individual disciplines, especially with regard to the subjects traditionally favoured by higher class girls (history of art, classics or biology), would probably reveal even sharper contrasts. If there is a female profile of cultural capital, it can be seen clearly in these decisions: and if there is a female pattern of motivation—Böttcher *et al.* (1988, p. 127 f.) find female students more interested in personal competence, males more career-oriented—it may at the same time be a realistic subjective reflection of their objective gender-specific career chances.

Secondly, surely changes in career perspectives due to the academic labour market must alter the whole picture? Indeed, if it were a matter of economic principal and interest, reactions would be quick and clear. But, as Table III showed, the changes are slight and the structural relations remain steady, probably because of the 'relative autonomy' of the cultural field and because cultural capital is less easily transferred. Figure 1 shows that, as might be expected, between 1982 and 1985 the greatest decreases and increases were generally in the fields where employment prospects were worst or best respectively, i.e. in social sciences, engineering and economics. But they also show that the changes are greater for men than for women and generally smaller at

both extremes of the social spectrum, where those at the bottom do not see many alternatives and those at the top do not feel forced to make any real effort.

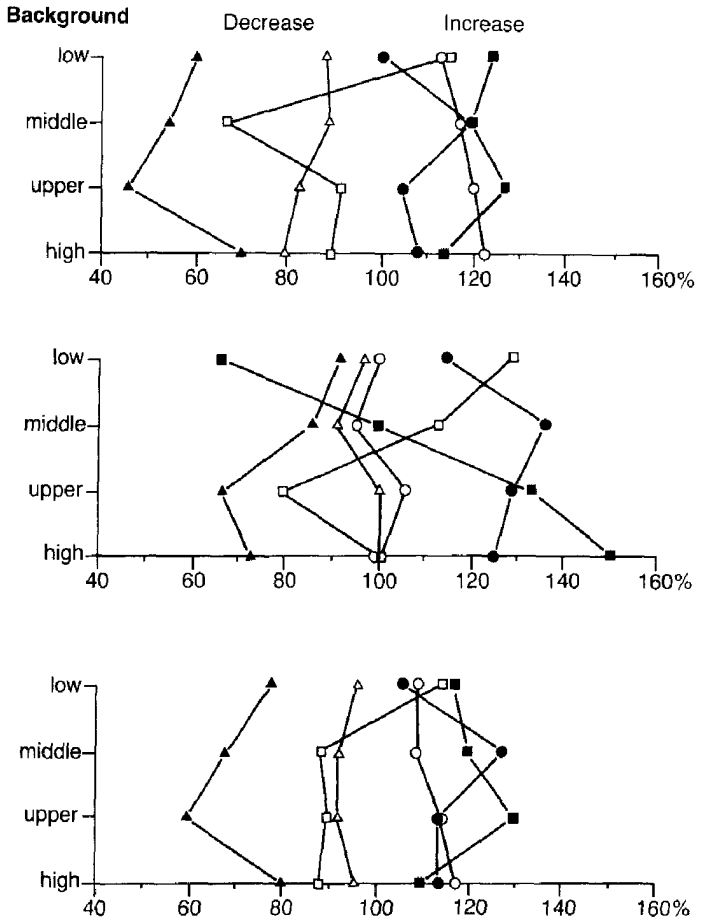

FIG. 1. First- and second-year students at German universities and colleges in 1985 by social background and choice of subject in comparison with all students in 1983 (=100). (■) Engineering; (▲) social sciences, psychology, education; (○) mathematics, natural science; (△) humanities; (●) law, economics; (□) medicine. *Source:* Schnitzer *et al.* (1986, p. 375).

The different representation of social groups and gender helps to differentiate the disciplinary cultures. Using preferences with regard to lifestyle, kind and source of furniture or clothing, types and target regions for vacations etc., Apel (1987) was able to show traits of a rather bourgeois conformist culture among students of law, of a rather petit bourgeois, sometimes pretentious, yet sometimes divergent culture among students of education. The Projekt Studium und Biographie (1988; cf. Apel, 1990) is widening the indicators to include cultural preferences regarding art, music, sport, etc. and is finding similar results. Student culture seems to be consistent with what was said earlier about faculty culture.

Motivation

The social strategies at work in the decision to go to university and in the choice of subject cannot be expected to be expressed directly in the motives students declare in

large-scale surveys. In the first place, they are pursued at least in part unconsciously, most of all by students from a milieu where studying at the university and perhaps even the subject to study are a matter of course. Secondly, the questionnaires, mostly tending to the 'catch-all' type, are not at the level of refinement where they ask about such thoughts or feelings as 'cultural distance'. Thirdly and perhaps most importantly, students learned early on and accepted the answers socially desired *in their fields*. This in itself is of interest (a) for the culture, here the normative climate, of the disciplines, and (b) as a reflection of the place within the cycle of reproduction of the disciplinary field and the professional field to which it leads. From the numerous sources only one example will be cited here. According to Reissert (1980, p. 88), 50% of all German students subscribe to motives so honourable in academia as specific interest in and/or talent for the subject. But considerably more than the average do so among students in the humanities and in mathematics/natural sciences [7]—the core disciplines, by the way, of a liberal arts college or curriculum—while at the same time fewer of them articulate aspirations to a certain professional position, to a safe or well-paid or especially esteemed job, or better chances of employment. This was very wise if one looks at their actual career prospects at the time: they like what they can have and devalue what they are unlikely to get, and at the same time consent to the norms and self-concept of their environment. In this respect students in the social sciences are similar, being concerned with personal growth and social change. Medical students by contrast are oriented not so much to the subject, but most of all to their profession, one that is safe and so imbued with respectable goals ('to help others') and social status that it is superfluous to mention income. High income, however, is more openly acknowledged as an objective, along with good job opportunities, among students of economics or business administration and law, who clearly consider their curricula as tools with no special appeal to personal interest, goals or talent.

All of this is neither new nor surprising: the distribution of *motives* to study and to choose subjects has remained remarkably constant among German students since the 1950s, as Gleich *et al.* (1982) claim—at least on this level of questions and answers. But even on this superficial level the results mirror the normative climate in the disciplinary cultures, which has its equivalents in other elements of everyday life. From the way students do or do not make use of university rooms and libraries, make a sharp or less sharp distinction between work and leisure time or between public and private, through to their learning strategies and their criteria for good teaching [8], disciplinary cultures differ in the degree of indentification with the subject and the world of academia versus instrumentalisation of study and student life for external goals [9]. This is true of students and their contribution to disciplinary cultures—but their professors have passed through and been influenced by that environment, too, and as teachers are affected by it whether, for instance in an 'instrumental' subject, they still like and share the dominant external orientation to (professional) practice or have themselves turned to the intrinsic norms of the academic field.

Furthermore, what has been presented about differing *social recruitment* to the disciplines is neither a recent nor a purely national phenomenon: similar distributions of social groups to disciplines have been shown over the years and for other Western societies as well [10]. These patterns have been known since at least the 1960s, when it was a matter of great concern theoretically for the sociology of education and practically for political attempts and social movements to reduce social inequalities and to improve equality of opportunity in education. The trouble is that this part of social reality tends to be forgotten, if not deliberately ignored, by a sociological theory

of systems lacking even the categories to analyse it and by a political ideology which keeps telling us that social inequalities, leave alone class structures, are in any case diminishing or becoming obsolete in modern pluralistic societies. It would fit all too well with such a trend if disciplinary cultures were to be conceived and described as phenomena exclusively belonging to and explainable within the academic field.

NOTES

[1] The following results are obtained regardless of whether the measure used is self-localisation on a Left-to-Right scale, preference for political parties or candidates, or position in current social controversies. Note that the attitudes tend to become more conservative when the questions come nearer to the domains (institutions etc.) of the interviewees.

[2] In Germany this is called *Grundausstattung*. Calculated by discipline and per student, annual expenditures in 1985 ranged from DM 6100 in social sciences to DM 17,800 in natural sciences and DM 36,100 in medicine. (BMBW 1987, p. 217)

[3] Bourdieu's usage of 'capital' has been criticised because the connotations of 'expropriation' and 'surplus value' in Marxist theory seem to be missing in the social and cultural field. Other connotations (e.g. 'investment', 'interest'), however, make it suitable as a metaphor.

[4] It has been noted that this fourth type of capital, which Bourdieu introduced only in his later work (e.g. 1982, 1985), is not well defined and not always easily distinguishable, especially from social capital. Nevertheless, the category seems appropriate and necessary to describe certain phenomena of authority and credibility in the academic field, and in order to convey that here (as in other fields) this capital hides the economic one which—negated or devalued as itself—can operate only in disguise (as Bourdieu says: 1987, p. 215).

[5] The problems involved are of course legion: surveys use different definitions of social class; consider only the father's job and/or qualifications or else both parents; cover different disciplines and often aggregate them so that essential features are lost; all the categories may have different meanings in different national contexts.

[6] In interpreting the social distribution shown here it should be remembered that, in addition to universities (*Wissenschaftliche* and *Kunst-* or *Musik-Hochschulen*), German higher education includes *Fachhoschschulen* which provide more vocational education and take well over 20% of all higher education students. These institutions take 50% more students from disadvantaged backgrounds (29%) than do universities (18%), but far fewer from upper class families (see Schnitzer *et al.*, 1986, pp. 108 ff.). In those fields where *Fachhochschulen* also provide courses (mainly engineering and social work, but also business administration, librarianship, etc.), the social differences between disciplines may be less accentuated because the students are more highly selected. Although this is important, especially for international comparisons, the present paper deals with universities only.

[7] Differentiation would be desirable here and in the following passage for physics, astronomy, geology, in all instances tending more to the academic side, versus chemistry, biology, mostly more to the engineering side.

[8] Such differences of student life and learning are described in more detail by

Liebau & Huber, 1985; Apel, 1987, 1989; Huber, 1990, and with regard to teaching-learning by Kolb, 1981; Entwistle & Ramsden, 1983.

[9] This echoes the famous distinctions made by Clark & Trow, 1966 (although there is no such thing as a 'collegiate' culture in German universities). However, there it was to analyse only climates of colleges as a whole; here, not insignificantly for German higher education, it differentiates between disciplines.

[10] Cf. Bourdieu & Passeron, 1971, p. 246 for France in the 1960s; Kelly, 1976; Williamson, 1981 and generally the UGC-statistics for the UK in the 1970s and 1980s; US Bureau of the Census, 1982 (Tables 5–7 and Introduction) and the Carnegie Undergraduate Survey Marginals (1984) for the US. US statistics, however, raise some difficulties for interpretation: they are generally more concerned with race than with social background and more with type of institution than with field of study (which reflects different structures and lines of selection). Those I consulted dealt with college students who often had not yet chosen their major and could not yet choose medicine or law, most significant disciplines for our argument.

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