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Ethnocentrism of Disciplines and the Fish-Scale Model of Omniscience[1]

Donald T. Campbell

This chapter is a preliminary exercise in the sociology of science—an exploratory application of principles of groups and intergroup organization to group processes in the institutionalization of science. The goal in this book is a comprehensive, integrated multiscience. The obstacle described in this chapter is the "ethnocentrism of disciplines," that is, the symptoms of tribalism or nationalism or ingroup partisanship in the internal and external relations of university departments, national scientific organizations, and academic disciplines. The "fish-scale model of omniscience" represents the solution advocated, a solution kept from spontaneous emergence by the ethnocentrism of disciplines. The slogan is collective comprehensiveness through overlapping patterns of unique narrownesses. Each narrow specialty is in

[1]From *Interdisciplinary Relationships in the Social Sciences* (pp. 328–348), by M. Sherif and C. W. Sherif (Eds.), 1969, Chicago: Aldine. Reprinted by permission of the estate of the late Donald T. Campbell. The author is deceased. At the time of his death he was Professor Emeritus at Lehigh University

this analogy a "fish scale." Figures 1.1 and 1.2 illustrate the title. Our only hope of a comprehensive social science or other multiscience lies in a continuous texture of narrow specialties that overlap with other narrow specialties. Due to the ethnocentrism of disciplines, what one gets instead is a redundant piling up of highly similar specialties leaving interdisciplinary gaps. Rather than trying to fill these gaps by training scholars who have mastered two or more disciplines, we should be

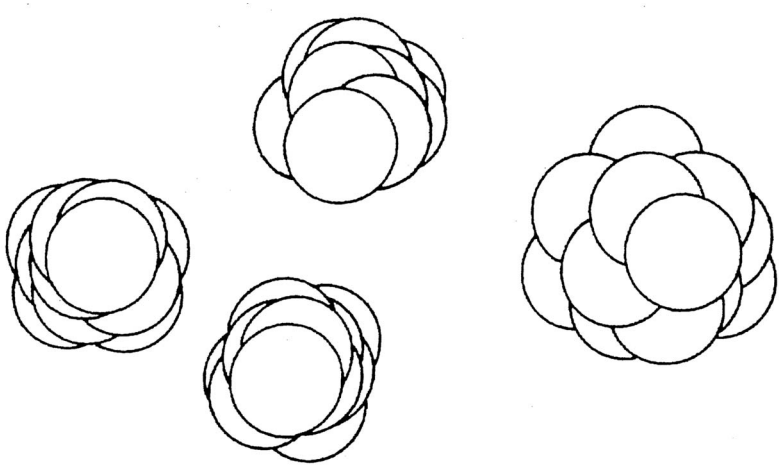

FIG. 1.1a. Present situation: Disciplines as clusters of specialties, leaving interdisciplinary gaps.

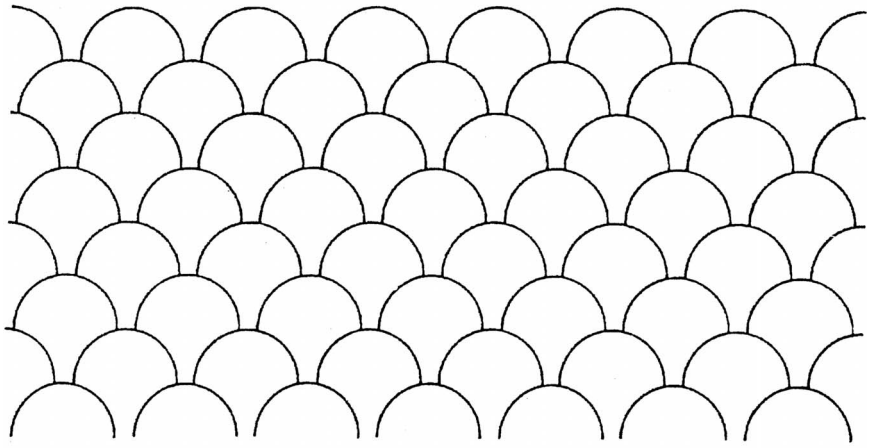

FIG. 1.1b. Ideal situation: Fish-scale model of omniscience.

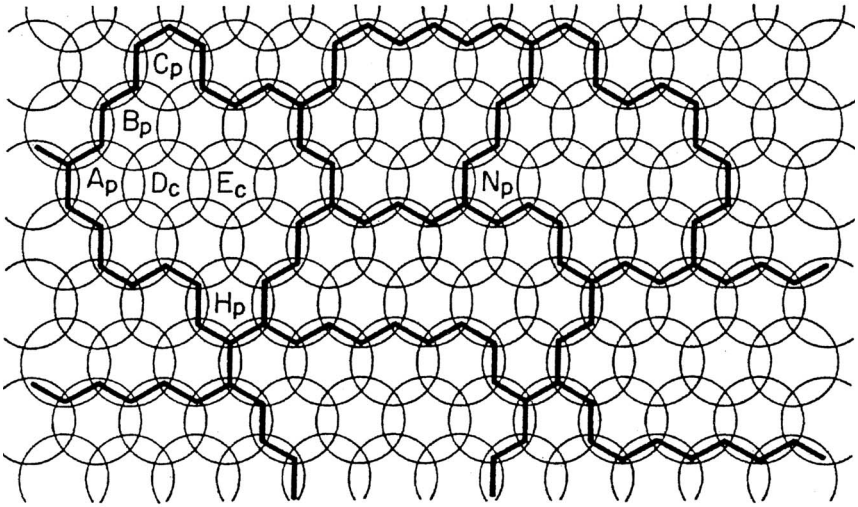

FIG. 1.2.a. Hypothetical pattern of specialty overlap at the time of superimposition of arbitrary "departmental" boundaries (heavier lines).

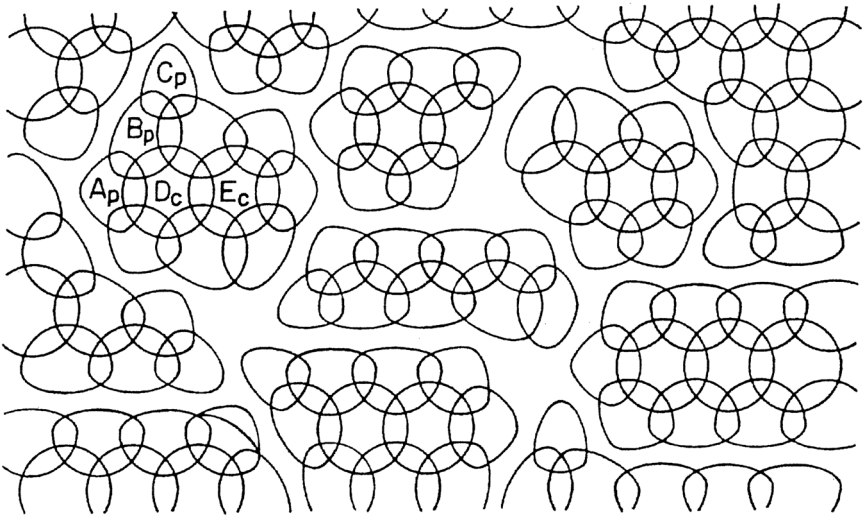

FIG. 1.2b. Resulting modification of specialty overlap as a result of organizing decision making and communication along the arbitrary "departmental" lines. ("Departmental" boundaries omitted to facilitate inspection of specialty overlap pattern.)

making those social-organizational inventions that will encourage narrow specialization in these interdisciplinary areas.

The diagrams of Figure 1.1 and 1.2 are of course an oversimplification, an analogy in two dimensions of what should be *n* dimensional. Particularly likely to be dyscommunicative are the exaggerated gaps between the disciplinary clusters. The real situation is perhaps more often one of unrecognized overlap. The disciplinary clusters may at their edges overlap other clusters, but as ships that pass in the night, they fail to make contact. The clusters, as it were, may overlap but lie on independent planes. Such an alternate diagramming might be possible, and the reader is invited to substitute it in his or her mind's eye in what follows. The issue, too, is not one of total absence but of relative density of interdisciplinary specialties.

COMPREHENSIVE TRAINING AND THE LEONARDESQUE ASPIRATION

Too often in discussions of interdisciplinary training one hears calls for breadth, for comprehensiveness. Too often we attempt the production of multidisciplinary scholars, professionals who have mastered two or more disciplines, rather than interdisciplinary specialists. This orientation I parody as the "Leonardesque aspiration": the goal of creating current-day Leonardos who are competent in all of science. As a training program, it is bound to fail in one of two directions. At its worst, it produces a shallowness, a lowest common denominator breadth, an absence of that profound specialization that is essential for scientific productivity. At best, it is evaded in the direction of the interdisciplinary narrowness here advocated.

BURGEONING LITERATURE AND THE OBLIGATIONS OF INTERDISCIPLINARIANS

One of the several background facts that lies behind my emphasis is the enormous past and burgeoning present literature. Speaking for myself, any volume such as this raises guilt feelings in that it acquaints me with the existence of scientific literatures of obvious relevance to my work that I have neglected. William McGuire's paper (1969), for example, lies in an area of high relevance to my work, and yet I have not read or read at even half of his citations and was not at all aware of the existence of another sizable proportion. However, it is not only multidisciplinary

conferences that have this effect. Unidisciplinary conferences remind me that I am failing to keep up in areas once central—and so does the arrival of one of the few journals I take (and read only 10% of), or chance inspection of one of the many journals equally relevant to which I do not subscribe.

What seems to me essential is that moving into an interdisciplinary problem area not increase this obligation and guilt—that for every new literature we pick up, we are excused from or drop some other literature so that the interdisciplinarian is free to remain as narrow, as specialized, as any other scholar.

MYTH OF UNIDISCIPLINARY COMPETENCE

Lying behind many models of interdisciplinary competence is an unrealistic notion of unidisciplinary competence—the image of scholars competent in one discipline. It will clarify the discussion of interdisciplinary competence to recognize at the outset that there are no such persons. What we have instead is a congeries of narrow specialties, each one of which covers no more than one tenth of the discipline with even a shallow competence. Yet individual disciplines do have some integrity, some comprehensiveness—at least in comparison with social science as a whole or with specific interdisciplinary areas. What must be recognized is that this integration and comprehensiveness is a collective product not embodied within any one scholar. It is achieved through the fact that the multiple narrow specialties overlap and that through this overlap, a collective communication, a collective competence and breadth, is achieved. This approach is our only hope for a unified and complete behavioral science. The present social organization of science impedes it.

LOCUS OF SCIENTIFIC KNOWLEDGE IS SOCIAL

Philosophy of science and epistemology have not yet assimilated the fact that the problem of knowledge must, in the end, be stated at the social level—although Charles Sanders Peirce and James Mark Baldwin, for example, were making this point at the turn of the century. Moving the problem of knowledge from a solitary viewer's vision to language is a step, but the implicit model is still usually a single native speaker with perfect knowledge of a stable language. Sufficient attention is not yet given to the social and incomplete conditions of language learning, to

the fundamental idiosyncrasy and errorfulness of functional individual lexicons, to the very partial distribution of words that are still somehow "in" the language, to the effective redundancy that makes imperfect language as competent as it is. When these have been assimilated, the locus of "truth" and "knowledge" will have clearly shifted from individual "minds" to a collective social product only imperfectly represented in any one mind. Similarly, in the philosophy of science, the competence, the discipline, the verification, and the integration are all in the end social products, imperfectly and incompletely represented in the work of any one scientist. Michael Polanyi (1966) wrote to this point in *The Tacit Dimension* identifying the locus of scientific authority as the "Society of Explorers" itself:

> … the *principle of mutual control.* It consists, in the present case, of the simple fact that scientists keep watch over each other. Each scientist is both subject to criticism by all others and encouraged by their appreciation of him. This is how *scientific opinion* is formed, which enforces scientific standards and regulates the distribution of professional opportunities. It is clear that only fellow scientists working in closely related fields are competent to exercise direct authority over each other; but their personal fields will form *chains of over-lapping neighborhoods* extending over the entire range of science. It is enough that the standards of plausibility and worthwhileness be equal around every single point to keep them equal over all the sciences. Even those in *the* most widely separated branches of science will then rely on each other's results and support each other against any laymen seriously challenging their authority. (p. 72)

PRESENT DISCIPLINES AS ARBITRARY COMPOSITES

Although it is probably not essential to the perspective, it is certainly relevant that the present organization of content into departments is highly arbitrary, a product in large part of historical accident.

Thus, *anthropology* is a hodgepodge of all novelties that struck the scholarly tourist's eye when venturing into exotic lands—a hodgepodge of skin color, physical stature, agricultural practices, weapons, religious beliefs, kinship systems, language, history, archeology, and paleontology.

Thus, *sociology* is a study of social man in European industrialized settings, a hodgepodge of studies of institutional data in which persons are anonymous—of individual persons in social settings, of aggregates

of person data losing both personal and institutional identity, and of interactions that are neither persons nor groups.

Thus, *psychology* is a hodgepodge of sensitive subjective biography, of brain operations, of school achievement testing, of factor analysis, of Markov process mathematics, of schizophrenic families, of laboratory experiments on group structure in which persons are anonymous, and so forth.

Thus, *geography* is a hodgepodge of land-surface geology, of industrial development, of innovation diffusion, of social ecology, of political territoriality, and of visual perception of areal photographs, and of subjective phenomenology of mental maps.

Thus, *political science* is a hodgepodge of political entities as actors and persons as actors, of humanistic description and scientific generalization, of history, and of social psychology.

Thus, *economics* is a hodgepodge of mathematics without data, of history of economic institutions without mathematics or theory, and of an ideal model of psychological man.

There are no doubt many natural divisions within the domain of the social or behavioral sciences—but they are not employed in the allocation of content to disciplines. A hierarchy of levels of analysis exists in which the focus of differential description at one level becomes the assumed undifferentiated atoms of the next: This is the atom-molecule-cell-organ-organism-social group and so forth model. On this hierarchy, sociology, political science, geography, and anthropology are all mixed across the individual and group levels and so is experimental social psychology. The experimental laboratory work of Sherif, Lewin, Lippitt, and Bavelas in many instances has represented psychologists doing experimental sociology, experimenting with social structure, developing laws about social norms in which persons are treated as undifferentiated atoms and in which the resulting laws relate social structural and group-product variables.

Another natural division is between the descriptive humanistic on one hand and the scientific on the other. On this dimension too our departments and disciplines are mixed, with all save history having both strong scientific and strong descriptive-humanistic factions.

There are ways of describing the internal logic and coherence of disciplines, but this cannot be done with singular principles and still capture both the reason for the content within one discipline and the reason for the same content's appearance or exclusion in others. Cer-

tainly the dimensions so used would be only a partial sample of potential classificatory criteria.

The specialties within disciplines are more coherent, and eventually such specialization takes over, each scientist allowing the congeries of irrelevancies within his or her own disciplinary knowledge to atrophy, journals to go unread, subscriptions to lapse, and so forth. The temporary disciplinary breadth transiently achieved in graduate school is of course not undesirable—the objection here is rather to the repetitious duplication of the same pattern of breadth to the exclusion of other breadths equally relevant but organizationally unsupported.

Effects of Organizing Specialties into Decision-Making Units

Consider what would happen if we took a large domain of specialties and aggregated adjacent dozens into "departments" as collective decision-making units. In this hypothetical example, suppose that the aggregation has been arbitrary except for the requirement of adjacency, that all specialties are equally well staffed to begin with, and that any specialty can belong to only one department. We are now interested in the effect of this second-level organizational structure, this superimposition of departmental boundaries on the specialty boundaries. We are particularly interested in differential effects on the future growth of the "central" specialties versus the peripheral or marginal specialties, this centrality or marginality being in this hypothetical case a purely arbitrary by-product of where the administrative boundaries happened to fall. Figure 1.2 is an effort to portray this starting point. (In Figs. 1.2a and 1.2b, A_p, B_p, and C_p, are examples of peripheral specialties, and D_c and E_c of central ones.)

Consider first purely internal decision making. For most issues, there are differences in priority and preferences that are associated with specialty points of view, and overlapping specialties are apt to have overlapping preferences. The situation will also be that collective decisions will be achieved only by a consensus of a plurality of specialties within the department. The accidentally central specialties have more natural allies within the department and find it easier to achieve support for their concerns. The natural allies of the peripheral specialties lie in other of the arbitrary departments and are organizationally prevented from effectively presenting their consensuses. The incidentally central specialties are also more frequently the compromise candidates, and when an ideology is needed to rationalize the historically arbitrary departmental-

ization, it is the concerns of the central specialties that are chosen as epitomizing the true common denominator as the essence of the initially arbitrary aggregate. Centrality becomes reinterpreted as common root, trunk, and fountain head when initially, it meant only remoteness from the boundaries with other departments.

Here are some considerations that would illustrate these purely internal dynamics. The selection of a chairperson in a peaceful department will follow these lines—only if a peripheral is a compromise between two strong factions, each with some central specialties, will he or she be a chairman. Deciding on a core curriculum to be required of all students, the minimum essential to their being sound, well-grounded *X*-ologists, will go in this direction. Pressure there will be to require one course from each specialty. Demands for time to meet the needs of specializing will preclude this in any but the smallest departments. The process of choosing a smaller set will involve the elimination of peripheral specialties because inherently, in the arbitrary organizational structure, there are fewer other specialists in the department who deem them important. This tautology may of course be expressed ideologically as "that's not really *X*-ology—it even comes close to being *Y*-ology." The setting of qualifying exams and dissertation committees will exercise a constant centralizing bias on the training of graduate students in peripheral specialties. Going across departmental lines in study programs is wasted effort as far as these important hurdles are concerned. The peripheral specialist himself or herself will be anxious that his or her students show up well on the central core content and will be willing to see equally or more relevant cross-department content be neglected because no punishment is involved in its neglect, no institutional reward in its achievement. This is a minor problem if these departmental hurdles are low. However, there is great pressure on departments to achieve excellence, and there is a perverse tendency to see this as implemented by high standards in the achievement of passive regurgitative mastery of past achievements in the literature. Under the institutional decision-making arrangements here described, the inevitable effect of higher standards in training is greater neglect of peripheral and cross-departmental content, and this is without the by-product of increasing the profundity of specialized training for any but the central specialties.

Deciding who in the department merits a raise or is ready for promotion, whose competing offer it is essential to meet and whose the department has not the funds to match, whose specialty needs additional

staff and space—all show the effect of the arbitrary location of departmental boundaries on what becomes defined as central or peripheral. In my professional career at four universities, I have repeatedly seen men who were of exceptional creativity and competence and who were absolutely central as far as social science or behavioral science was concerned (occupying positions like those designated as H or N in Fig. 1.2a), be budgetarily neglected and eventually squeezed out because the departmental organization of specialties made them departmentally peripheral. That in some cases these were arrogant men does not explain the result because their detractors were also arrogant men but more centrally located. However, a selective feedback may well be at work; it may be that of all those who are initially attracted to peripheral, boundary-crossing specialties, only the arrogant persist in bucking the institutional pressures that would otherwise move them to more centrally defined specialties.

The dynamics just described are internal to our hypothetical departments. These arbitrary budgetary units compete with each other as budgetary entities for budget increases, space increases, and personnel increases. The specialties within the arbitrary departments thus come to share common fate and become joint actors in competition with the other arbitrary aggregates of specialties. This common fate, although arbitrary in its initiation, is real enough in practice to provide the basis of an ingroup identification against competitive outgroups. There also develops implicit or explicit competition for the most talented students and indoctrination procedures designed to maintain the loyalty of those who have tentatively joined. Characteristic of ingroup–outgroup relations in other settings, these indoctrination procedures not only emphasize ingroup virtues and ideology but also contrasting outgroup faults. Philosophy and sociology departments have frequently maintained internal solidarity by teaching about the wrongness of behavioristic psychology. Sidney Aronson (1969) has documented the manner in which historians build ingroup morale by deprecating sociologists. (It is even symptomatic of ethnocentrism that the first illustrations that come to his and my mind are ones in which our own departments are being wrongly disparaged by outgroups rather than vice versa.)

If I add to my hypothetical example the feature that on most university campuses, the arbitrary aggregations into departments be parallel as to which specialties are combined, further institutional pressures emerge. Departments' students must be prepared to appear adequate

to centrally dominated hiring committees at other universities. The new faculty appointments to the department must be ones that inspire admiration on the part of the parallel departments of other universities.

Effect of Departmental Organization on Scientific Communication and Specialist Competence

In this topic, I come to the most direct effect of departmental organization on scientific knowledge. Each scientist's competence, his or her participation in the collective activity of science, is based on communication. The hypothetical departmental organization under consideration affects communication patterns in many ways. In my hypothetical example, suppose that those specialties aggregated into an arbitrary department be housed adjacently but that departments be scattered at random. Incidental oral and paper-passing communication links thus become predominantly intradepartmental, and the extradepartmental aspects of peripheral specialties suffer great relative neglect in comparison with their intradepartmental overlaps. Shop talk, reading of dissertations, reading of each other's preprints and reprints, and looking at laboratory setups and research instruments all illustrate primary modes of communication seriously warped. The bias extends also to books and journals read. One is rewarded socially for shared detailed reading of exciting new developments. No such reward occurs for unshared reading, and thus, the literature in the cross-departmental aspects of a specialty loses ground to the reinforced intradepartmental reading.

With a parallel arbitrary organization occurring at other universities and in national and international disciplinary organizations, still other boundary effects occur. Professional organizational membership and their journal discounts to members lead to stereotyped patterns of journal subscription, with most members limiting themselves to journals within one field—these are invariably so voluminous that one excuses himself or herself for not reading in other fields by noting that this would be foolish when he or she is not even able to keep up in "his or her own field." "Own field," needless to say, tends to become defined in terms of these arbitrary departments whenever it goes beyond the narrow specialty. Abstracting sources, annual reviews, handbooks, and so forth, further the redundant repetition of intradepartmental patterns of breadth at the expense of equally relevant cross-departmental ones.

The annual reviews and handbooks do another disservice from the fish-scale model. Even within departments, each scholar's coverage must be partial, collective competence being assured by different partialities for each. Annual reviews and handbooks become crutches leading large numbers of scholars to the same partiality and the inevitable neglect of other partialities. The degree of this partialness is generally underestimated, impressed as one must be at the long bibliographies appended.

The departmental grouping of communicators allows unstable language to drift into unintelligibility across departments. A basic law is that speakers of the same language, once isolated into separate communities, drift into local idiosyncrasies and eventually unintelligibility once the discipline of common conversation is removed. This tendency produces departmental linguistic idiosyncrasy even for shared contents and referents. Furthermore, as Edmund Leach and others have noted, such idiosyncrasy may be exaggerated as an ingroup solidarity device. What is despised as jargon by the outgroup may be the shibboleth of adequate professional training by the ingroup.

RESULTING ETHNOCENTRISM OF DISCIPLINES

Figure 1.2b shows the results of these dynamics. A few isolated specialties have been lost, and the peripheral specialties have allowed their cross-departmental edges to atrophy, producing departmental discreteness and interdepartmental gaps.

What started out as a hypothetical case has occasionally in the previous paragraphs drifted into the description of current actualities, perhaps blurring the point being made: Even if the true nature and the historical starting point had been one of a homogeneous texture of overlapping specialties, the organizing of specialties into departments and disciplines for decision-making and communication purposes would have produced disciplinary discreteness, cohesiveness, and interdisciplinary gaps such as exist at present. These features therefore should not be judged to justify as natural the existing arrangements of specialties.

The historical origins of departments and disciplines are of course quite other than those of my hypothetical example. The actual histories add historical depth to the tribal myths of origin and no doubt provide a greater true commonality to departments than in this hypothetical instance. Yet no matter what the degree of valid core and discreteness, the

dynamics described here would inevitably have the effect of artificially enhancing it.

A MISCELLANY OF REFORMS

A New Ego Ideal for the Scholar as Student

At the present time the ego ideal of scholars calls for competence, for complete knowledge of the field they claim as theirs. In their everyday interaction with fellow specialists, scholars tend to feel guilty when they find that they have not read what others have read. Although scholars inevitably learn to live with such guilt feelings, this ego ideal spells the direction of their guilt. If scholars take to heart the notion that scientific competence can never be embodied in single minds—that their guilty neglect is not their unique shame but the inevitable predicament of all and that science is somehow achieved in spite of this—they may come to substitute a quite different ego ideal, a quite different focus of guilt. Rather than praying, "May I be a competent and well-read *X*-ologist, may I keep up with the literature in my field," a scholar will pray, "Make me a novel fish-scale. Let my pattern of inevitably incomplete competence cover areas neglected by others." Each scholar would then try to have a pattern of journal subscriptions unique to his or her department, university, or profession. Noting that the scholar and a colleague were reading the same set of journals, the scholar would feel guilty and vow to drop one of these in favor of some other. Recognizing that the interdisciplinary links in the collaborative web of knowledge are the weakest, the scholar would give up some ingroup journal in favor of an outgroup one. The scholar would feel guilty if he or she did not cut attendance at ingroup conventions to attend relevant outgroup ones, and so forth.

There is a secondary payoff in cross-disciplinary reading and conventioning. Scholarly reading for the true scholar is ideally recreational, something the scholar enjoys doing and would choose to do reactionally even if he or she had some other profession. The social system of science, particularly in graduate school and in the first stages of a scientific career, associate such activities so strongly to the reward and punishment system of competitive evaluation that they cease to be relaxing or effectively recreational. In the current disciplinary organization, the scholar will often find that the journals and conventions of a neighboring discipline can still serve this recreational function—particularly if the scholar accepts his or her role as smatterer and does not assume the

obligation of "mastering" that literature. If my fish-scale model were to become the norm, such reading would of course tend to become more obligatory and run the risk of ceasing to be recreational.

While on the themes of recreational reading and the duplication of fish scales, it seems appropriate to deplore the tendency of social scientists to feel that they all should read current newspapers, particularly the *New York Times.* Certainly the collective perspective would be better if most spent the equivalent time with newspapers of other epochs or with historical, anthropological, archeological, or literary descriptions of quite other samples of social milieus. Rather than the ego ideal of keeping up with the current worldwide social developments, the young scholar should hold the ideal of foregoing current informedness for some infrequently sampled descriptive recreational literature. Too often our ego-ideals call for uniform omniscience, knowledge of both past and present, of both here and there, and too often we settle for the same pattern of compromise all our colleagues are settling for. Compromise from the Leonardesque aspiration there must be, but even in leisure reading, one can hold as ideal the achieving of unique compromises.

An Ego-Ideal for the Scholar as Teacher

Under the ideology of disciplinary competence, a department feels that its staff should be able to provide competent guidance in the PhD programs it offers, that students should bend their interests to the locally available specialties or go elsewhere, that to train a student properly, the faculty should be more competent than the student in the student's area of study. Combining this with the organizational advantages of one-headed decision-making units in dissertation direction, and so forth, a strong tendency toward duplicating of identical fish scales within departments results.[2]

Under the fish-scale ideology, professors would feel guilty when they turned out "chips off the old block," PhDs who showed the same pattern of overlap as they did. The goal instead would be to encourage each new PhD to select such a novel specialty that each one could indeed within his or her graduate training become one of science's leading experts, a fully contributing specialist. Note the difference between this approach to instant expertness and that of exhaustive mastery of an exceedingly narrow

[2]For total careers, there is, of course, considerable freedom to redefine personal specialties within disciplines. This, combined with the needs for autonomous personal identity within face-to-face departments, reestablished the needed texture of overlap within disciplines.

realm within one specialty. The latter asks graduate students to be narrower than their mentor, to subspecialize within their mentor's range. The former asks the graduate student to achieve a novel range, not necessarily broader or narrower than the mentor's. One greatly needed implementation of this goal is to encourage the PhD to give up some traditional intradisciplinary subfield in favor of mastery of a cross-disciplinary one of relevance. A common reason given for rejecting this is that for such a content, we *X*-ologists would have no way of checking the PhD's competence—a typically ethnocentric reaction, illustrating again the way in which, given our present organization into departments, concern over evaluation of competence decreases the crossing of departmental bounds in specialization.

Using the Advantages of Smallness and Bigness

Generally speaking, the larger the university, the wider the variety of specialists available and the more likely that the full range of possible specialties be represented by actual persons. This being so, one might expect the interdisciplinary gaps to be less and interdisciplinary collaboration to be more frequent. In actual practice, the contrary is more apt to be the case (although we need studies to verify this), and the laws of group organization and size applied to departmental organization explain this. The larger the department, the more obligatory relationships there are intradepartmentally and the more the totality of obligatory and informal relationships is predominately intradepartmental. The larger the department, the more required courses there are for graduate students within the department (Aronson,1969, cites a study by Sibley to this effect) and the less opportunity and the greater jeopardy for cross-departmental study. In the smaller department, the loyalty demands are less, informal communication and friendship links are more frequently cross-departmental, collaboration across departmental lines is less apt to involve loss of intradepartmental esteem, and graduate students are more apt to feel sufficient mastery in their home departments to have time to explore outside. Northwestern University has had an exceptionally productive period of interdisciplinary collaboration in recent decades, at a time when most universities have been finding such relationships increasingly impracticable. The explanation lies in part in the chance accumulation of a few key leaders with this orientation, such as Richard Snyder in political science, but more significant, I believe, has been the smallness of its departments combined with low teaching

loads and a full commitment to research and graduate training. Most places this small are focused on undergraduate training. Most places focused on research and graduate training combine this with largeness. In contrast stands the University of California at Berkeley where interdisciplinary contacts have steadily decreased as departments grew and where once interdepartmental institutes have become annexes of single departments.

The reprise is Bigness increases the isolation of departments and decreases the interdepartmental fish scales unless organizational reforms are devised to prevent this.

Ad Hoc Interdisciplinary Training Programs

Even at Northwestern, what crossing of disciplines we achieve is mostly at the faculty level. My own graduate students are as unidisciplinary as any and rarely do more than a required course or two outside of psychology. Were I to push them to a real mastery of some relevant-to-them, cross-disciplinary specialty—be it time-series analysis in economics, analysis of ideology in sociology, or child rearing customs in anthropology—I would be adding to an already inhibiting burden of requirements. However, if I could at the same time relieve them of the need to master some physiological psychology, or the sensory discrimination literature, or the like, such programs would be possible. They are also much needed, not because they would be better than the present mix but because they individually might be as good and because the combination of some of these plus some of the standard would be collectively stronger than the present all-of-one-type.

At a place with relatively good (although minimal) interdepartmental contact like Northwestern, one should be able to train hybrid specialists such as these with an ad hoc assembly of core courses, fields for prelims, and dissertation committees tailor-made for each student. The adviser and student would assemble an ad hoc training advisory faculty and schedule of courses. Perhaps a divisional review committee would have to check the program to assure that it was as exacting and as coherently specialized as the standard programs required in the overlapping departments. Such a committee would also conduct written and oral qualifying exams and guide the dissertation. If the possibility of use to evade difficult requirements emerged, the program might be restricted to only the top half of entrants. If perceived as a vehicle for inadequate professors, the prerogative of advising on such programs could be limited to an elite of

proven unidisciplinary capability, and so forth. To coordinate with the labels of the disciplines nationally, the PhD would be designated according to the department of his or her senior advisor. If departments objected to thus anointing an inadequately trained *X*-ologist, a dual labeling could be adopted—PhD in *X*-ology (divisional) for the new type, PhD in *X*-ology (departmental) for the old. In the present academic market, we should have no difficulty placing such PhDs. Thus, with no such drastic reorganizations as creating new rigid interdepartments, with no new budgetary units, and with no new staffs, a congeries of new specialties each as coherent and narrow as our present PhD programs could be achieved.

Paralleling such ad hoc training programs for graduate students, ad hoc decision groups substituting for departments in deciding on raises, promotions, and tenure, might well be established for interdepartmental faculty appointments with some divisional funds allocated for such purposes separate from departmental budgets.

Organizational Alternatives for Journals and Conventions

Our academic professional organizations publish journals and offer them to their members at reduced rates. There results a repetitious patterning in the several journals each scholar takes. If our associations would make these same rates available to the members of other disciplinary associations (as indeed some do), novel journal sets would become more frequent. In the creation of new journals, broad interdisciplinary scope should be eschewed for novel narrowness. The *Journal of Verbal Learning and Verbal Behavior* sets an excellent example. It is much narrower than the *Journal of Experimental Psychology*, which it overlaps heavily, but it juxtaposes work by experimental psychologists and by linguists so as to eventually nurture some novel fish scales.

Our professional conventions are too large, have too many simultaneous meetings, cover too wide a range of specialties, and last too long. If our conventions instead were held at different times by each specialty (e.g., by divisions within the American Psychological Association), and if the scholar did his annual conventioning by attending several of these shorter ones, he would be much more likely to cross disciplinary lines.

SUMMARY

Interdisciplinary programs have been misled by goals of breadth and multidisciplinary training. Even within disciplines, disciplinary compe-

tence is not achieved in individual minds but as a collective achievement made possible by the overlap of narrow specialties. This fish-scale model of collective omniscience is impeded in interdisciplinary specialty areas by the ethnocentrism of disciplines, by the organization of specialties into departments for decision making and communication. For an integrated and competent social science, we need to invent alternative social organizations that will permit the flourishing of narrow interdisciplinary specialties.

Donald T. Campbell: A Tribute

Donald T. Campbell was "a nimble-minded social scientist who left his mark on half a dozen disciplines and helped revolutionize the fundamental principles of scientific inquiry common to them all" (Thomas, 1996). Campbell, a social psychologist, did his major work at Northwestern University, but his last university post was at Lehigh University where he was designated a "university professor" with faculty appointments in the departments of psychology, sociology, anthropology and education.

They could have easily thrown in biology, the philosophy of science and market research. For a generation, virtually no respectable researcher this side of the chemistry lab has designed or carried out a reputable scientific study without a thorough grounding in what Dr. Campbell called quasi-experimentation, the highly sophisticated statistics-based approach he invented to replicate the effects of the truly randomized scientific studies that are all but impossible in the slippery and unruly world of human interactions (Thomas, 1996).

Dr. Campbell argued that valid inquiry in the social sciences required the sophisticated interaction among many methods. This was the theme reflected in his famous paper with Donald W. Fiske, "Convergent and Discriminant Validation by the Multitrait-Multimethods Matrix." More than 300,000 copies of "Experimentation and Quasi Experimental Designs for Research," a book written with Julian Stanley, have been sold (Thomas, 1996), and this book is yet to be replaced as the research bible for field-based social intervention studies.

Campbell, who had studied how academic departments often stifle the advance of knowledge, coined the tongue-in-cheek phrase, "fish scale model of omniscience" in reference to a serious theory about the distributed nature of knowledge. Permission to reprint this piece is given by his son, Martin Campbell, who recalls his father as a personal

genius as well as an intellectual. "My memory is that Dad affectionately referred to this one as perhaps chief among his crack-pot articles.... Yes, please include my father's piece with my and the family's blessings."

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