Making friends, or before the science

Willard McCarty
Professor of Humanities Computing
staff.cch.kcl.ac.uk/~wmccarty

URC 2010: *UG Research in Computer Science – Theory & applications*
www.urc-stars.org.uk/
King's College London
24 March 2010

1. Introduction

This is a lecture about being interdisciplinary, that is, about how to make friends across the divides which distinguish and separate disciplines from each other. My assumption will be that because problem-solvers need problems to challenge them, you students of computer science will have no difficulty understanding that the ability to think your way into domains different from your own is important. I am not assuming that you will know how to do this or that formal training in interdisciplinary research is part of your curriculum. If it is I will be glad for the news and want to know the details. But I am not taking such training for granted.

You will, perhaps, know of the engineer, mathematician and computer scientist Richard W. Hamming, who worked on the Manhattan Project during World War II and then for Bell Telephone Laboratories for 30 years, where he collaborated with Claude Shannon. In his 1968 Turing Award lecture, "One Man's View of Computer Science", he spoke in a very practical way about "the danger of getting lost in the details of the field.... We must", he said, "give a good deal of attention to a broad training", and he went on to say that for computer science it is especially true that "'specialization leads to triviality'.... Narrower and narrower specialization is *not* the answer, since in part the difficulty is in the rapid growth of the interrelationships between fields" (1968: 4-5). This was not, for him, a question of what interdisciplinarity might be in theory. He stressed the practical side because in order for computer science to survive in the long term, he said, it needed to find its problems in the lives of others and to address them. This implies that the skill of seeing into those lives, to those problems, and seeing them in their terms, is of the essence. That's the skill I am going to be talking about.

2. My view of the world

I am someone who by choice and profession works in the field we now tend to call "the digital humanities" but which I call "humanities computing". I reserve the former term, digital humanities, to cover all of what happens with computing in the disciplines, the latter term, humanities computing, to denote the interdisciplinary common ground or "Methodological Commons" where scholars meet with technically adept colleagues to collaborate on digital projects. [**FIGURE 1**] Here is a diagram to show these two sorts of activity: at the top the various disciplinary groups with which people like me interact and collaborate in digital humanities work; on the bottom the disciplines from which we draw our arguments and technical methods to form humanities computing; in the middle the Commons itself, where I live. Although meetings between humanist scholars and technical experts are now relatively commonplace at many institutions around the world, King's College London is, as far as I know, the only one where such encounters are orchestrated by an academic department dedicated to the purpose. The reasons for our uniqueness in this respect are complicated and beyond my scope to explain here. Suffice it to say that basic institutional conservatism, which is particularly characteristic of the humanities, is largely responsible for the slow growth elsewhere. But change is afoot, especially in Canada.

My role within our rather special department is that of a theoretician, or as I prefer to think of it, a careful, reflective observer. My concern is, as the Canadian sociologist Irving Goffman and the American blues singer Marvin Gaye are both famous for having asked, what's going on? I have been in active pursuit of ever better answers to that question for the last 25 years, from the time when, with new PhD in hand, I began listening to the claims being made and the fears expressed by scholars in the humanities and started trying to understand the causes and implications of both. I think I have fairly good answers now, and so am not so shy anymore about making recommendations as to the course and direction of a most promising future for the digitally engaged humanities.

3. Disciplines as epistemic cultures

Here, however, my subject is (as my title suggests) what must happen "before the science" in order to enable it: that skill of seeing into the lives of others. Before any engagement with a discipline, either to collaborate with an individual scholar from that discipline or to take ideas from it to inform computing, one must think one's way into the discipline in much the same way as a social anthropologist intending to study a culture other than his or her own must understand that culture in its own terms. Disciplines, in other words, are "epistemic cultures", as Karin Knorr Cetina says (1999). These epistemic cultures are not, in my view, domains to be plundered or territories whose defining barriers are to be broken down in some war of

liberation. Rather they are ways of being, acting and communicating whose value to the world is liberated through respect and careful study. This study has enormous payoffs: not just interesting problems to work on but a challenge to one's own disciplinary self-understanding. The real liberation to be desired is from one's own disciplinary provincialism.

The disciplines represented at the bottom of the diagram are all important to humanities computing, but two of them have a especially intimate role to play. Computer science is perhaps the more obvious of these, though its interrelations with the humanities are problematic and the subject of ongoing discussion. Unfortunately I won't have time to talk about that now. What I want to talk about, or rather talk with, is the second of the two special disciplines, ethnography (which is what social anthropologists do), as it is applied to the urgent problem of interdisciplinary research.

4. Interdisciplinarity

I expect that you may be surprised by my calling interdisciplinary research an "urgent problem". For one thing it would seem that nearly everyone these days is doing it. For another it is hardly new: adventurous scholars have undoubtedly always gone wherever their questions have led them. How, then, is interdisciplinarity a problem for us now?

The word is in fact relatively new: the *Oxford English Dictionary*, for example, records its first occurrence in 1930 (cf. Klein 1990, 19-39). In 1970, for example, the editor of a book entitled *Science and Literature: New Lenses for Criticism*, used the word to introduce his collection of articles but put it in quotation marks, suggesting its expected unfamiliarity (Jennings 1970: vii). In 1976, when the journal of which I am Editor, *Interdisciplinary Science Reviews*, began, the founding editor Anthony Michaelis said that he chose the word for its title because interdisciplinary articles were much needed and not catered for in the then existing scientific literature (2001: 310). Like many others who have written on the topic, Michaelis felt the need in his inaugural editorial to define "interdisciplinary". In 1980, implying the phenomenon to be so new that attention needed to be drawn to it, the anthropologist Clifford Geertz argued that a great change was afoot among the disciplines. This change, he wrote, was surfacing not just in the then recent mingling of the social sciences with the humanities but more in the blurring of scholarly genres. This he called "the refiguration of social thought" (2000/1980). This Refiguration, or rather refiguring, now looks more like the normal state of affairs rather than a temporary phase.

What, then, has provoked it? Deeper explanations are on offer (for example, by Hugh Kenner's wonderful book *The Counterfeiters*) but let me offer two of the more obvious ones. First is the great, powerfully energising assembly of physical and

social scientists, engineers, mathematicians and others during World War II, out of which computing as we know it came. This interdisciplinary assembling of some of the greatest scientists of the time gave them an experience of working together that they never forgot. Cybernetics was one product of it, and out of that came cognitive science. The second provocation to interdisciplinarity is computing itself. Since 1991, when the Web became public, computing for academia (like it or not) has meant primarily the online mechanisms of distributing scholarship. The greatly lauded accessibility of writings in digital form, thanks to projects such as JSTOR and Muse, has not simply brought a deluge to the individual's desk. It has also effectively dissolved away the former containment of each discipline's materials by physical partitioning within the library. Due to the primitive, indeed crude nature of search mechanisms and the strategies practical to implement across such large-scale collections, transgressing disciplinary divisions, at a speed great enough to make a real difference, is now the default condition of scholarly research. Of course the scholar can restrict him- or herself to particular journals, but the default is not to do that. What then follows is confrontation with the intriguing if not compelling opportunities to pursue one's question so easily into now open fields of research. And note: I am not speaking only or even primarily about the work senior scholars like myself do. I am talking about what you do, or could do, and should be doing.

So, now, less than a century after the word was apparently first used, less than thirty years after the effects it names were appearing in the social sciences and about twenty years after it started to take over, interdisciplinarity is clearly no longer such a new thing, even for the graybeards to notice. Claims to be doing it are now rife, the need to demonstrate it close to required in some quarters and the literature on it voluminous. Indeed, *The Oxford Handbook of Interdisciplinarity* (Frodeman *et al* 2010) – surely a guarantee of acceptance – is now in first-proofs stage and due to be published later this year.

But amidst all the enthusiasm and pressure for being interdisciplinary, amidst all the *de facto* doing of it, the researcher is not as well served as could be. The problem is that interdisciplinary has become a transcendental virtue, i.e. a good if not indispensible attribute without any need for qualification, justification or training. We have had strong argument since the late 1980s, for example from the philosopher of science Thomas Kuhn and the literary scholar Stanley Fish, that strictly speaking it is impossible. Referring to his wrenching transitions among the three disciplines he commanded – physics, history and philosophy – and to this famous Gestalt drawing [**FIGURE 2**], Kuhn noted that "Though most people can readily see the duck and the rabbit alternately, no amount of ocular exercise and strain will educe the duck-rabbit" (1977/1968: 5-6). Fish argued further that to promote interdisciplinarity perverts scholarship because it is based on what is almost certain to be pretense (1989). At the same time we have seemingly endless theoretical discussion about what interdisciplinarity might be, with distinctions drawn between multi- and/or

trans-disciplinarity *ad nauseam*. We have very recent accounts of the messes researchers can get into by trying. So you can understand why, as someone who has been interdisciplinary for the last few decades, with very strong evidence that I am hardly alone in this, and no evidence that doing what I have been doing has been anything but hugely beneficial, I have found myself quite puzzled: what exactly is impossible or perverse to attempt? And there is the urgent, practical question of training people like you. Since extra-disciplinary wandering is happening and shows every sign of continuing to happen, and since the theoretical literature provides little to no guidance, how should professors like myself, who are here to provide this guidance, respond? What is the way forward?

5. How it is done

This lecture is all about how I un-puzzled myself and came up with a means of changing interdisciplinarity from a transcendental virtue to a plan of action.

Logically at least my first step was to look carefully at the arguments for impossibility. Both Kuhn and Fish (and perhaps others who agree that being interdisciplinary is wrong-headed) are arguing that there is no perfectly neutral standing point from which disciplines may be viewed. I think this is quite correct: one has to be somewhere intellectually before other places come into view. Kuhn does not argue that switching among disciplines is impossible: indeed, he did it with three of them (and found the switching very difficult, as I said). Fish argues or at least implies something more, however: that since one cannot be perfectly of another mind one should not try. This is equivalent to arguing that since no human being (short of a bodhisattva, perhaps) can be perfectly good, one should not try to be good. As someone who thinks that the struggle to be good is what life is all about, I disagree. I think that the point is the trying. And so I ask: what do we know about doing it – about thinking our way into that which is other than ourselves?

Now there is too much to be said about this for the time I have, so let me restrict the range of answers by asking a narrower question: to what discipline do we turn to learn about thinking one's way into a culture other than our own? As I have already hinted, and as you may know from the computer science literature, the answer is social anthropology, for the practice of ethnography. The two greats whose writings I depend on for guidance here are Clifford Geertz, whom I have already quoted, and even more the Australian ethnographic historian Greg Dening, who calls the central act "crossing the beaches of the mind" (1998). The standard anthropological term for the role at which such beach-crossing aims is that of the "participant-observer", neither wholly one nor the other but something uncomfortably, powerfully in between.

When one takes the anthropological approach to working with colleagues in their distinct epistemic cultures, the old metaphors with which we think about disciplines are shown up for the limiting structures they are. Certainly for someone like me and someone like you, the most fruitful way to think about a discipline is not as if it were a finite geo-political territory – in computer science usually called a "domain", i.e. an "estate or territory held in possession" (*OED*) – or as if it were a fixed branch on a great tree of knowledge – in computer science often the metaphor of choice for the knowledge-representation people – but as an island in a great archipelago of learning. This makes us shipboard merchant explorers, and it makes our central act negotiation across cultures.

6. Exploring disciplines

My final step toward a plan of action has been to lay out a course of instruction by which one could get started in doing what I have just briefly described – not to argue over what being interdisciplinary might be, not whether it is possible or a good idea, rather actually to take some baby-steps and see for oneself. Here I don't have time to get into the dangers and difficulties of taking those baby-steps, but let me assure you they are very real and quite formidable. All I have time for is to describe what I have done. It appears to be working.

I am referring to a PhD and MRes-level course, "Exploring Disciplines", [**FIGURE 3**] which is just now finishing its inaugural term for the King's Graduate School. Let me finish up here by explaining briefly how it works and then by going through the syllabus and commenting on it.

Exploring Disciplines proceeds within a seminar structure – one hour's introduction followed by an hour of discussion. It begins by considering in the first two weeks the growing necessity for such explorations, whatever the discipline of origin, then a few key writings on interdisciplinarity [**FIGURES 4-5**]. As you can see, readings (which are supplied as pdfs) are divided into "core", which everyone is asked to do; "volunteer", for comments to be presented in class; and "recommended". The burden on already very busy PhD students has proven heavy and may have to be rethought after the participants' evaluation of the course is completed in a couple of weeks. But the readings are heavy because this is a serious undertaking.

The next session is devoted to outlining an ethnographic strategy for thinking one's way into a foreign discipline, named as you can see with Greg Dening's metaphor [**FIGURE 6**]. It also takes up, in addition to Dening, two of Geertz's stories about his crucial anthropological encounters, in Bali and in Sefrou. Then the humanities are situated within the whole range of academic disciplines and related practices [**FIGURE 7**], considering several accounts but centring particularly on the cognitive psychologist Jerome Bruner's, in his marvellous essay "Possible Castles" (1986). The

remainder of the course consists of six brief case-studies of disciplines and disciplinary areas, beginning with philosophy [**FIGURE 8**]; note especially Dame Gillian Beer's question that I raise there: "how to distinguish what's central from what's peripheral in this other zone; how to tap into the hinterland of controversy that lies behind the works on the shelf; how to avoid becoming merely disciples because not in control of a sufficient range of knowledge" (2006). Beginning with philosophy, participants are asked for each discipline to figure out the nature of its normal discourse: as Richard Rorty says, "that which is conducted within an agreed-upon set of conventions about what counts as a relevant contribution, what counts as answering a question, what counts as having a good argument for that answer or a good criticism of it" (1979: 320). The manner and rhythm of publications and other communications are also considered. Then follows literary studies, history, archaeology & epigraphy [**FIGURE 9**]. I conclude with computer science [**FIGURE 10**], using the ACM's classification system, to display the enormous range of things computer scientists do, and a chapter from my own book on humanities computing in which I consider your discipline in great detail. In a final meeting [**FIGURE 11**] comparisons among the differing clusters of evidence and assumptions are presented in order to focus more sharply on the challenges and opportunities of interdisciplinary research.

7. Conclusions

Clearly much is to be learned from the students in this course once I have their comments. Like all courses several iterations will be needed for it to reach whatever stability is possible and seems desirable. But I have no question that what I have done for the past many years to enable responsible exploration of the reach and abilities of computing in the humanities is, at least in the first stages, a teachable strategy. The course has demonstrated that, and so it will be offered regularly twice each academic year from Spring 2011.

It is no accident that computing should provide perhaps the best starting point for thinking one's way into disciplines other than one's own. This, I think, is because computing is concerned, at least where it meets areas of application, precisely with how they do what they do, and to what they do it, as these can be resolved into data and software. As disciplines become more interpretative the reduction of sources and procedures to data and software becomes less complete, and so there is greater need for respectful observance of what's actually going on in the eyes of those for whom it is going on. And, you may already know, in dealing with the problems of clients (which are your raw material), it becomes increasingly necessary, as the distance between what computers can do and what needs doing increases, to be able to understand and explain the nature and qualities of computing to match the often unarticulated expectations of those clients. This means, of course, understanding

your own discipline from the perspective of a foreigner to it. So the powerful searchlight of interdisciplinary explorations needs also to be turned on yourselves.

Works cited.

Beer, Dame Gillian. 2006. "Speech on the Challenges of Interdisciplinarity". Institute of Advanced Study, Durham University. www.dur.ac.uk/ias/news/annual_research_dinner/ (24/3/2010).

Bruner, Jerome. 1986. "Possible Castles". In *Actual Minds, Possible Worlds*. 44-54. Cambridge MA: Harvard University Press.

Dening, Greg. 1998. "Beaches of the Mind". In *Readings/Writings*. Melbourne: Melbourne University Press.

Fish, Stanley. 1989. "Being Interdisciplinary Is So Very Hard to Do". *Profession 89*: 15-22.

Frodeman, Robert, Julie Thompson Klein, Carl Mitcham and J. Britt Holbrook, eds. 2010 (forthcoming). *The Oxford Handbook of Interdisciplinarity*. Oxford: Oxford University Press.

Geertz, Clifford. 2000/1980. "Blurred Genres: The Refiguration of Social Thought". In *Local Knowledge: Further Essays in Interpretative Anthropology*. 19-35. New York: Basic Books.

Hamming, Richard W. 1968. "One Man's View of Computer Science". 1968 ACM Turing Lecture. *Journal of the Association for Computing Machinery* 16.1: 3-12.

Jennings, Edward M. 1970. *Science and Literature: New Lenses for Criticism*. Garden City NY: Doubleday & Co.

Kenner, Hugh. 2005/1968. *The Counterfeiters: An Historical Comedy*. Normal IL: Dalkey Archive Press.

Klein, Julie Thompson. 1990. *Interdisciplinarity: History, Theory, & Practice*. Detroit: Wayne State University Press.

Knorr Cetina, Karin. 1999. *Epistemic Cultures: How the Sciences Make Knowledge*. Cambridge MA: Harvard University Press.

Kuhn, Thomas S. 1977/1968. "The Relations between the History and the Philosophy of Science". In *The Essential Tension: Selected Studies in Scientific Tradition and Change*. 3-20. Chicago: University of Chicago Press.

Michaelis, Anthony R. 2001. *The Scientific Temper: An Anthology of Stories on Matters of Science*. Heidelberg: Universitätsverlag C. Winter.

Rorty, Richard. 1979. *Philosophy and the Mirror of Nature*. Princeton: Princeton University Press.