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Bridging the Abyss

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Bridging the Abyss: A Paper presented to the Oxford Round Table, July 2006 by

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Abstract:

This paper seeks to explain the epistemological bases for the two cultures and to show why this disciplinary divide continues to plague American academic culture. Next, we discuss strategies for bridging the two cultures through general education curricula which promote mutual understanding of the two cultures while educating students in basic skills. Evidence is presented which shows the efficacy of these integrative, interdisciplinary curricula. In conclusion, we briefly mention some collaborative research efforts which indicate the enduring effects that such an education may have.

Epistemology : The Reasons for the Two Cultures

In 1541, when Rene Descartes published in French "Meditations on a First Philosophy", he inaugurated the problem of consciousness and, with it, the onset of an anxiety which pervades the Western intellectual tradition. For, according to Descartes, unless I posit the existence of a concerned and benevolent deity who guarantees the accuracy of my perceptions of the phenomenal world around me, then I can never be certain that what I perceive actually exists or that others share my perceptions. As Descartes himself states:

> ...the most common error ...encountered here consists in judging that the ideas which are in myself are similar to or conformable to things outside myself (Descartes 2003, 406 para 37).

According to Descartes, I can only be certain of one true fact - namely that I, the thinking thing, must exist. To amplify this position as stated in the famous 'cogito ergo sum', because I can perceive that thinking is happening, I can posit that something must exist which is doing the thinking. But questions posed as to how I exist, or what form my existence takes, involve me in the problem of consciousness.

Nonetheless, to return to the 'cogito', I can still affirm the truth of the fact that I, the thinking thing, must exist. Furthermore, it is reasonable to assume that most thinkers who pondered the problem of consciousness, perhaps even Descartes himself,

felt a definite uneasiness about warranting perceptions of reality by recourse to metaphysics, a strategy fraught with epistemological conundrums and contradictions.

Having plunged us into the problem of consciousness, Descartes offers a solution, perhaps not totally satisfactory but certainly one that raises our hopes. In paragraph 20 of the Meditations he states:

> Arithmetic, geometry and the other sciences of this nature which treat only of very simple and general things without concerning themselves as to whether they occur in nature or not, contain some element of certainty or sureness. For, whether I am wake or whether I am asleep, two and three together will always make the number five, and the square will never have more than four sides.... (Descartes 2003, 407)

Ah, mathematics as savior! Thus, if I can reduce aspects of my perceptual field to quantifiable mathematical systems, I then have something certain, something true, and something that I can share with others.

If then we accept mathematics as a partial solution to the problem of consciousness, then we ought to ask which disciplinary domain uses mathematical systems as a descriptor of objects in that domain. To resort to a colloquialism, this domain is that of the 'hard sciences' and other disciplines that use mathematics and the verification of mathematically quantifiable results through repeatability, also known as the scientific method. We note that the scientific method directly addresses a crucial aspect of the consciousness problem, that is, proving the certainty of a shared

perception of reality. Thus, when C. P. Snow surveyed the 'scientific culture', he understood that, although "...biologists more often than not will have a pretty hazy idea of contemporary physics...there are common attitudes, common standards and patterns of behavior, common approaches and assumptions"(Snow 1961,10). Thus, for us Post-moderns, mathematics, instead of Descartes' benevolent deity, guarantees the certainty of our perceptions of the world of phenomena.

Now as comforting as that may be for scientists, Shakespeare's *Hamlet* or Velasquez' painting "Las Meninas" or Conrad's novel *Heart of Darkness* are not suitable subjects for mathematical enquiry. And those aspects of these artistic works which might be susceptible to mathematical analysis will never give us the definitive meaning of why Hamlet delays or explain whether Kurtz's dying cry, "The horror, the horror," is irrelevant or the very key to the novel's meaning.(Conrad 1988, 77)

There have been attempts to use statistical methods in literary analysis and though they prompt, certain noises of polite interest, such statistics can never penetrate to the heart of the matter. To give an example, in the case of the Athenian dramatist, Euripides, it has been shown that variations in the iambic trimeter (a meter similar in structure and in function to Shakespeare's iambic pentameter) occur more frequently in the later tragedies.(Webster 1967, 3-4) Thus, statistics help us date Euripides' extant tragedies. Statistics, however, do not have much relevance for helping us to uncover Euripides' attitude towards the gods.

And it is the very inability of scientific methods to unravel questions of meaning or value, in short, to verify aesthetic statements, that accounts for the great divide.

Thus, while scientists rest secure in a perceptual reality guaranteed by mathematical analyses and by the scientific method, we in the humanities and arts watch in dismay as changing fashions, often subservient to social or political agenda, decide aesthetic questions. For example, in Post-modern literary theory, I would have a great deal of difficulty arguing persuasively for the intrinsic artistic superiority of Shakespeare's *Hamlet* over the United States Federal Tax Code. According to criteria presented in a current handbook on literary theory which addresses the question "What is literature?", I would have to state that both texts are meaningful in that their respective authors had a definite intention in mind when they were composing their respective texts. Both texts use language 'purposively' and for a particular expressive goal. The readers of each text reads with certain expectations and attentively. And finally, both texts "...encourage reflection as the way to engage with the world ...or promote the questioning of authority and social arrangement" (Culler 2000, 37). Indeed, there are not any indicia of literature which Culler brings forth to answer the question "What is literature?" that could not be applied to both *Hamlet* and the Federal Tax Code.

On what, then, other than on my subjective reactions or on my culturally received value system, can I justify my privileging of *Hamlet* over the Federal Tax Code ? And even when we can agree that *Hamlet* is great art, Ernst Jones, a Freudian

analyst and I disagree about the reasons for Hamlet's delay. And whose interpretation is correct or true, since both of our conclusions may rest on a series of subjective perceptions, some of which may lie, as Freud himself tells us, below the threshold of consciousness in that gloomy swamp of the subconscious.

In fact the current state of affairs in literary studies is aptly summarized by Culler:

The meaning of a work is not what the author had in mind..., nor is it simply a property of the text or the experience of a reader. Meaning is an unescapable notion because it is not something simple or simply determined. It is simultaneously an experience of a subject and a property of a text. It is both what we understand and what in the text we try to understand. Arguments about meaning are always possible,and in a sense meaning is undecided always to be decided... (Culler 2000, 63)

Oh for the clarity and decisiveness of scientific fact and the uniformly shared reality of the scientific method !

Once we realize that the two cultures operate from two entirely different epistemological bases, then we can devise strategies for creating common ground or at least for fostering an understanding of these different foundations.

As a professional educator, who has spent my entire academic career in what is vaguely termed general education courses and programs for college Freshmen and Sophomores, my strategy will naturally rest within the area of general education

curricula. At first glance, this seems an obvious solution and one that has been employed repeatedly in the past. Indeed, most colleges and universities to a varying degree require their students, regardless of major, to take certain courses in basic skills in the humanities and sciences as part of a concerted effort to give breadth to undergraduate education. A recent survey conducted by the American Association of Colleges and Universities in 2000 found that ".. general education has increased as an institutional priority according to 64 % of the respondents"(Ratcliff et al. 2001,7). In fact, required general education courses have increased since their all-time low in 1974, when student protests led to " relaxed requirements"(12-13). Thus, in 1974, 33.5 % of a student's baccalaureate degree was spent in general education courses. Currently "the median is 40 percent of a 120 hour baccalaureate requirement or 47.8 units"(12). At San Jose State University where I teach, the total number of general education units is 57 semester units out of a baccalaureate total of 120 units. Almost 50 % of the baccalaureate is spent in general education.

Nonetheless, even with all these attempts at creating a common core of knowledge for all students, the two cultures still persist in much the same way as C.P. Snow described them in 1959.

I felt that I was moving among two groups - comparable in intelligence, identical in race, not grossly different in social origin, earning about the same incomes, who had almost ceased to communicate at all, who in intellectual, moral and psychological climate had so little in common.... (Snow 1961, 2)

And why is this still the case? Why do our engineering majors resent having to study literature ? Why do English majors not see the value of learning mathematics ? It is my contention that the problem is not that our students are not being broadly educated, but that it is the form in which this general education is being delivered.

A Curriculum for Bridging the Abyss

A consideration of how general education is delivered at a sample of institutions noted for their educational luster reveals what I call the canapé format of individual courses, which satisfy one aspect of general education requirements. In this format, students are offered a selection of courses divided into disciplinary areas from which they must choose a specific number of units. Individual courses are supposed to satisfy learning objectives in specific areas - usually written expression, critical thinking, speech, the sciences and mathematics, etc. From my own experiences, I find this learning format problematic. First of all, this suite of courses chosen from discrete disciplines lacks any semblance of coherency. Secondly, we allow our students to exercise their unformed and uninformed judgment on their education. Most students at some point in this GE banquet choose solely on the basis of their time schedule. Consequently they have little or no engagement in the course content because for them

it merely fulfills a requirement or gives them a convenient morning class on a Monday and Wednesday.

This canapé format for general education is precisely that of MIT, Cal Tech and my own institution, San Jose State University. At MIT the School of Humanities, Arts and Social Sciences provides required curricula which .." encourages students to develop a more mature understanding of a field in the humanities, arts and socials sciences... and to provide a good understanding of subject matter and methodologies used outside the natural sciences and engineering " (http://web.mit.edu/hass/ undergraduate /hass-req). Individual students tailor their humanities, arts and social science requirements (HASS) in concert with an advisor. From a suite of eight subject areas students take a minimum of 9 units in each area. But three of the eight areas have to be in HASS distribution courses which break down according to art, literature and social science. Further, an examination of course content is no different from lower division general education courses at San Jose State where students are required to take a certain number of units in art, literature, social sciences, science and mathematics in addition to American and California history and political institutions.These last requirements are mandated (and wisely so) by our state legislature.

The learning objectives specifically expressed at MIT could stand for all the schools I studied, my own included. Indeed, would educators say anything less? Implicit in the wide variety of course offerings is the belief that there are many ways to

achieve these learning objectives. Thus, it makes no difference what the specific course content might be as long as the course fits under a disciplinary umbrella. Thus, our students, like happy lambs grazing the clover of this rich variety of course offerings, will come away, we hope, with an affective understanding of the arts and literature, critical and analytic skills, and, "o frabjous day, callooh callay," a social conscience. The reference to Lewis Carroll's *Through the Looking Glass* says it all!

As interesting , innovative and cutting edge as the content of the general education courses at any one institution may be, there is no coherency, no common context from course to course. And, when attempts are made to institute commonalities or unity between courses, these attempts frequently come to nought. Carol Schneider observed in a recent collection of essays on general education:

Thus even as individual colleges and universities work to make their general education programs more coherent, fewer and fewer students proceed through those programs according to plan. Rather they take courses here and there, cobbling together bits and pieces of more than one curriculum. As students frequently tell us, their general education programs add up not to an intellectual framework, but rather, to an assorment of fragments to be assembled up and then left behind as quickly as possible (Association of American Colleges and Universities 2001, ix).

I often use a computer metaphor to accuse my students of erasing their brain's hard disk after the final exam so that they can free up disk space for the next semester's courses. To some extent, the ubiquitous institutionalization of all forms of assessment at

every level of the American educational system betrays our doubts about whether the learning objectives we so fervently espouse are addressed by such disjunctive curricula.

To be sure, the state of affairs in general education, despite all our interest and all our efforts, is in complete disarray. Harvard has even gone so far as to contemplate doing away with required general education courses altogether. Brown has already done so. And Stanford, for the most part in so far as humanities and the arts are concerned, has reduced learning to a one quarter course in methodology appropriate to the humanities followed by one course each subsequent quarter of the Freshman year structured around a theme. Innovative education to be sure, but substantive education, not at all.

A recent article in Peer Review addressing this very issue observed that some educational reformers in K through 12 education :

... advocated integration and argued that sophisticated levels of learning cannot be attained by studying subjects separately. The movement toward a brain-based approach furthered the case buoyed by research indicating the brain is a parallel processor that makes meaning by patterning (Klein 2005, 9).

It is interesting to note that for most students, once they have left the canapé feast of general education, their major programs of study offer coherent and systematized learning structures. Pre-requisites and introductory courses are the norm in all

disciplines before the student progresses to more advanced and sophisticated curricula in his or her major courses. Frequently major course work in the humanities is numbered and scheduled in such a way that historical frameworks are adhered to. For example, the required sequence in American literature at San Jose State offers English 56 A: *Colonial Beginnings to 1865* in the Fall semester while English 56 B :*Post Civil War to the Present* is offered in the Spring semester. From the way major required courses are scheduled, students are more likely to take courses in order. The question posed at this point is: since these structured sequences have proved effective in preparing our students for either the work place of graduate study, why don't GE programs of study follow a similar integrated and historically structured curriculum ?

Well, I propose to present a general education curriculum that does just that and further, one that has been shown to achieve as Klein states "..that set of core capacities which emerges from the intersection of integrative and interdisciplinary pedagogies" (Klein 2005, 10). These are :

- the ability to ask meaningful questions about complex issues and problems
- the ability to locate multiple sources of knowledge, information and perspectives
- the ability to compare and contrast themes to reveal patterns and connections
- the ability to create a framework and a more holistic understanding.

She concludes these competencies with the observation that: " contextually, conflict and change are defining parameters of this kind of learning."

At San Jose State University, entering Freshmen, if qualified, can elect to complete the bulk of their lower division general education requirements in a four semester sequence of courses where learning objectives in the humanities, arts and social sciences are achieved in a combination of large lecture format classes followed by small seminar discussions focusing on assigned primary readings in art, philosophy and history drawn from the great works of human culture. Although the core of the texts follows the so-called 'Western Canon', the inclusion of two or three different non-Western cultures each semester accounts for approximately 25 percent of the syllabus and provides a counterpoint to Western culture, while it encourages students to explore outside their own cultural frame of reference.

Because this is a two year program, exploration of all cultural monuments, Western and non-Western, can be done in depth since at least two lectures and two seminar sections are allotted to a single selection or an author. The inclusion of historical or critical background to the seminar readings is usually treated in lecture.

At this point I am sure that many of you are thinking that this kind of program has existed for generations and why should we hear another talk on the 'same old same old'. Indeed, the Humanities Honors Program at San Jose State has been in existence since the 1950's. However, because these Programs are on the surface 'old-fashioned ', it

is not a valid justification for discarding them. Others of you might remark that since the majority of the texts are drawn from the Western canon, that by discussing such texts, we are promoting Eurocentrism and its concomitant cultural imperialism. This is an attitude which I firmly believe needs to be discarded. That this curricular bickering is a serious obstacle to general education reform is unfortunately a widespread phenomenon in a profession which is supposedly dedicated to the disinterested pursuit of truth. The closing paragraphs of a recent study on the state of general education published by the American Association of Colleges and Universities remarked:

In short, the advance of General Education remains stymied by the organization and values of the academy itself. The tradition of faculty autonomy and the lack of tradition for working collaboratively, the preference of students ... for specialized study over the broad aims of general and liberal learning and the protection of turf by administrators and faculty alike: these are all major barriers to designing, approving, implementing and assessing an effective general education program (Ratcliff et al. 2001,18).

As an added obstacle, current graduate programs of study encourage young Ph.D s to specialize in increasingly narrower fields of study. Having expended so much effort in thesis research on a highly specialized topic, young graduates want to capitalize on all this hard work by teaching courses related to their doctoral studies. Thus, they are reluctant to teach general education curriculum which, in many cases, may be outside their areas of expertise. The result of all this is that general education courses are most often taught by temporary lecturers who, because of their exploitation

and marginalization, have no voice in general education reform nor any commitment to general education other than their paycheck. When we combine all these factors with a bias against the Western Canon then the problem becomes too Byzantine for any kind of simplification.

Regardless of our personal biases - for or against Western culture- we as Americans have been formed in the crucible of Western culture.We do our students great disservice by not allowing them to understand their culture. Unless they understand their culture, they cannot change it. And I firmly believe, given what is going on in the world today, change is needed and will always be needed.

To some extent, the antipathy towards Western culture on the part of many academics stems from Marxist cultural theory of the 1960's. These Marxist theorists, such as Marcuse, Lukács and others, indicted cultural monuments of the past as one weapon in the arsenal of the ruling class whose control of the means of production necessitated the concomitant control of the proletariat so that their labor could be exploited. I must admit that I have consistently used Marxist analyses to help students understand some of the social values implicit in the texts, art and historical processes they encounter. But, just because the poem *Gawain and the Green Knight* or the medieval Japanese novel, *Tale of Genji*, issue from, and are directed toward, a warrior, aristocratic elite is no reason to remove them from a general education curriculum. These extraordinary texts offer our students a window into an imaginative time and place.

One of my Japanese -American students when asked whether he considered the first two semester's reading too Eurocentric remarked, "Old stuff is cool." Fortunately students at San Jose State neither share nor care about the disciplinary battles laying waste to curricula in the Humanities and Social Sciences. They want to explore; they don't want to be indoctrinated.

Let me describe to you our program and its extraordinary success at a large, urban public university whose primary purpose, despite administrative rhetoric and mission statements, is to prepare lower and lower - middle class individuals for the work place.

San Jose State graduates provide 25 % of the work force for Silicon Valley high tech. We have a full-time student population which has stabilized to 27, 000 from a low of 24, 000 in 1981 to a high of 30, 000 in the boom years of the early 1990's. Of those 27,000 students registered in the Fall of 1999, minority students accounted for more than 15,000 students; 8000 students self-identified as white and 3,400 listed 'unknown ' as their race or ethnicity. The overwhelming majority of undergraduates elect majors that are unequivocally directed toward the job market. Business, Engineering , Computer Science and Applied Sciences account for more than 3,500 or 2/3 of the 5,300 degrees awarded in the Spring of 2000. One would expect at a campus this ethnically diverse whose students choose majors which will provide them with job skills that a humanities focused curriculum that is admittedly Eurocentric would have little appeal, and further,

that business and engineering majors would choose other more pragmatic options complementary to their majors to fulfill lower division general education requirements.

To a great extent our success is the result of three aspects of this program which I address in order. They are : learning community, curriculum, and faculty.

Unlike most general education programs, the San Jose State Humanities Honors Program is a sequence of four six - unit courses beginning in the fall semester of the Freshman year and concluding in the spring semester of the Sophomore year. Learning structure includes large lecture format classes twice weekly followed by small seminar discussion sections. Students stay within the same seminar cohort of about 25 students as they rotate each semester from one to another of the four team faculty. The total cohort of students on any one team usually numbers about one hundred students. Team faculty represent different disciplines in the humanities and social sciences. Thus, over the four semesters, a single seminar cohort will have had each of the team faculty for a semester. Since the entire team cohort meets twice weekly for seventy-five minutes to hear one of the team faculty deliver a background lecture on the seminar readings, students are already familiar with their instructors before they begin each new semester. In addition, students regularly maintain contact with team faculty throughout the two years as they rotate from one instructor to the next. Study sessions, group assignments reinforced by the learning structure create a cohesive, supportive learning community

at a large urban commuter campus where student demographics would not ordinarily favor such a development.

The success of this learning structure has been amply proved by the fact that our retention rate is twice the all-university average. For the years 1975 -1995 anywhere from 32% to 40 % of Fall semester Freshmen did not continue into the Spring semester. In contrast, the Humanities Honors program has a first semester attrition rate of less that 10% and an overall retention rate of 82 - 85 % over four semesters. It might be countered that because this is an Honors program that students of a high caliber would be more likely to remain in college to continue their studies. In Spring 2005, we recruited a special cohort of students who began San Jose State needing remediation. We offered them the opportunity to be part of the Humanities Honors Program if they could resolve the need for remediation and get a letter of recommendation from an instructor. This particular remediated cohort of students began in spring 2005 with 75 students and three faculty. After three semesters we still had 69 students enrolled. These retention statistics have prompted the office of Undergraduate Studies, an entity which in the past has been less than sympathetic to this Program, to submit plans to expand the Program. But it is not only the supportive learning community which contributes to the Program's success.

The curriculum in the first semester immediately engages the students' interest and imagination with the great works of the ancient world. Since many of our students

are engineering and science majors, team faculty in the large lecture format classes regularly provide material about ancient technology and science, architectural techniques and ancient trade and manufactures. Supplementary handouts and Power Point lectures keep students informed and engaged. In subsequent semesters, their intellects are progressively more challenged by the curriculum. In fact, at the end of the fourth semester at least 40% of students on any one team elect to fulfill a minor in the Humanities department.

Obviously course content in a four - semester program of study needs to be carefully considered. Here some observations of Alfred North Whitehead are remarkably apposite. He intimately recognized a central problem of general education courses, or as he terms them - general studies - in comparison with a student's major course of study, in his terms - specialist education. And that is the issue of student interest - a problem then as it is now according to a recent study on the status of general education in American higher education published by the Association of American Colleges and Universities in 2001.

Whitehead in 1929 observed in his essays on education that:

....the specialist study (i.e. major course work) is normally a study of peculiar interest to the student. He is studying it because he wants to know it. ...The general culture (i.e.general education) is designed to foster an activity of mind...What education has to impart is an intimate sense for the power of ideas and for the structure

of ideas ...which has a peculiar reference to the life of the being possessing it.
(Whitehead 1951, 23)

In addition to his remarks on general culture courses, he offers these further insights into the type of content likely to engage student interest. It is important to note that in constructing a curriculum he takes into account both the developmental stages of learning and of the individual. Currently, most of general education occurs in the Freshman and Sophomore years, i.e. between the ages of seventeen and twenty. In contrast the physical size of the brain peaks at age eighteen while specific nerve cells which link relatively disparate areas of the brain are not fully developed until complete adulthood (Restak 1979, 102). Thus, it is reasonable to assume that our students' learning capabilities, still in a formative state, need curricula which take into account these developmental changes. Whitehead's suggestions in the 1920's were remarkably prescient when he observed that there was a rhythmic character to intellectual growth. "(T)he quality of our teaching (i.e.curriculum) should be adapted to the stage in the (student's) rhythm"(Whitehead [1929] 1951, 41-42). We might state in more contemporary terms that our curricula ought to be adapted to the student's cognitive development.

A curriculum in harmony with Whitehead's rhythmic cycles would be one appropriate to the student's first stage in the cycle, the stage of imagination or romance as Whitehead calls it. In the next developmental stage, the curriculum is characterized

by increasing precision and by activities which foster intellectual discipline. In the final stage, the student engages in curricula which foster generalization (Whitehead 1951,43).

Specifically, the curriculum I advocate to a great extent mirrors these stages. The first semester focuses on the empires of the ancient world, - Mesopotamia, Egypt, Greece and Rome, China and India. Assigned readings in the art, architecture and literature are integrated with an examination, whenever appropriate, of the scientific achievements of ancient peoples. Western texts are chosen with the goal of explaining how Western culture develops over time. The inclusion of non-Western texts in themselves of major importance are related to the Western texts thematically. For example, after a discussion of Aristotle's *Nichomachean Ethics* and what the ancient Greeks thought were the proper activities for human beings, we read the *Analects* of Confucius as a counterpoint to Western constructs. These great monuments of human achievement provide a wealth of opportunity for the development of the student's imagination.

Confronted with the exoticism of ancient places and faces, students begin to form both social and academic bonds. Curriculum in the first half of the second semester continues this appeal to their imagination with such readings as *Beowulf*, Dante's *Commedia Divina* and *Tales from the Arabian Nights*. Subsequent readings in the second semester introduce them to medieval proofs for the existence of God. Regardless of their religious positions, analyzing these proofs provides them with a foundation for more

sophisticated discussions such as Montaigne's conception of the self, Buddhist constructs of self-reflexion and Francis Bacon's categories of perception. The third semester continues these disciplined analyses with readings in the British Empiricists and the political theories of thinkers such as Locke and Rousseau. This introduction to early modern political theory provides them with an understanding of the historical and philosophical matrix of American history and institutions.

The last point I would like to make about an integrated multi-semester program such as this concerns the faculty who will teach it. They are perhaps more important to learning than a well-constructed curriculum. Students on the whole are malleable with respect to curriculum. They trust our judgment. We are their teachers, assumed to be the holders of knowledge. But that position from which students will not retreat is being subjected to faculty who are inadequate to the task of teaching them. Faculty in a program such as this must be student-centered teachers. The focus must be student - learning not faculty performance. Unfortunately the academy is moving more and more towards rewarding faculty for their research rather than their teaching .

Indeed, the ongoing debate over the validity of student evaluations indicates our disquiet with our student's estimations of our performance. On the one hand, we demand that they be mature and responsible adults in fulfilling course requirements but, when they venture their thoughts on our performance, we discount their opinions. We accuse them either of vindictiveness over grades, or worse, of being seduced by

charismatic teachers. In the modern academy perhaps the most damning judgment that could be leveled at a teacher is the label 'popular'.

As coordinator of the Humanities Honors Program at San Jose State I regularly review faculty syllabi, assignments, and seminar topics in order to generate the lengthy and detailed assessment reports that all general education courses on our campus must submit on an ongoing basis. In addition, I ask for sample portfolios of student work from these faculty. I am consistently impressed with our faculty's performance on all counts. The rigor of their assignments and the careful seminar planning indicate a real commitment to engaging their students. As their supervisor, I regularly review their statistical evaluations. No faculty score below 4.5 on a five point scale. At least two thirds of them regularly score on the high end between 4.8 and 5.0. Individual narrative evaluations confirm the validity of these figures.

In order to achieve student success we need to put aside our egos and reward good teachers. At so-called research institutions a major shift needs to occur. It is at these institutions that the bulk of student teaching at the lower division level is relegated to graduate assistants. I will grant that their youthful vigor makes them ideal mentors to their young charges. Nonetheless, their commitment to the overall enterprise of general education is limited by their lack of expert knowledge and their marginal status in the academic hierarchy. I suggest that general education be a separate entity

where permanent faculty are hired, tenured and promoted primarily for teaching and for involvement in general education.

This does not mean that research is not a part of their professional obligations. Rather, conference papers, whether subsequently published or not, should count more than they do now. I am sure that this aspect of my paper may be the most controversial. However, it is of interest to note that Alfred North Whitehead recognized the importance of excellent teachers in 1929 when he said :

It must not be supposed that the output of a university in the form of original ideas is solely to be measured by printed papers and books labeled with the names of their authors. Mankind is as individual in its mode of output as in the substance of its thoughts. For some of the most fertile minds composition in writing, or in a form reducible to writing, seems to be an impossibility. In every faculty you will find that some of more brilliant teachers are not among those who publish. Their originality requires for its expression direct intercourse with their pupils in the form of lectures, or of personal discussion. Such men exercise an immense influence; and yet after the generation of their pupils has passed away , they sleep among the innumerable unthanked benefactors of humanity. Fortunately, one of them is immortal - Socrates (Whitehead 1951,103).

In keeping with Whitehead's remarks we may need to advocate a two-tiered faculty.This faculty structure is problematic, to say the least. Nonetheless, something drastic needs to be done to improve the overall quality of general education. Throwing graduate students into the fray only serves to indicate to our students that general education is not taken seriously by 'real' faculty. When we hire temporary lecturers to

fill these positions we create a disenfranchised transient professoriate who either through their tenuous employment or because of the very temporary nature of their positions have no enduring commitment to general education. We should reward faculty for teaching in general education programs. By institutionalizing general education as a separate entity, by motivating outstanding faculty to participate and by rewarding them either with advancement, salary raises or release time we might remove from general education its current stigma as the purgatory of academia.

In conclusion, I would like to make some remarks about course content in these programs. And again I will base my remarks on the Humanities Honors program at San Jose State. Our curriculum focuses entirely on what specific cultures have designated to be their great texts. These works have influenced their cultures for a reason. They have helped each culture describe what for that culture defines the human condition, what explains the central questions of human experience and what has formed each individual culture. By exposing our students to such texts we open them up to the full panoply of human creativity and possibility. I can think of no greater goal than this in general education.

Bridging the Abyss: Collaborative Research between the Two Disciplines

I would like close my discussion of general education as a means to bridging the divide between the sciences and humanities so that communication between these

groups becomes a source of fruitful collaborative research. Again I will draw from my own experiences. Currently I am engaged in a book - length study of the Greek goddess, Styx. In antiquity, both Homer and Hesiod make reference to her originary site on Mt. Chelmos in the northern Peloponnese. Local legends associated with this goddess have long been interpreted as just that - myths- with little basis in fact. However, understanding the geology of her originally site reveals, in my opinion, that these legends were prompted by a need to understand phenomena which have a geological basis. I was directed to investigate geology by a colleague of mine when I remarked that Styx's waters made a black stain on the sheer rock face from which they fall. She suggested I work with one of her hydrology students who was making a study of ground water in Greece. This student led me to several studies made by geologists in the 19th and 20th centuries which have completely altered both the direction of and the conclusions drawn from my research on this goddess.

In the same vein, collaborative research with those who are expert in computer technology has led me to several serendipitous discoveries. I am engaged in cataloging a series of 19th century photographs made of classical statuary in the Capitoline Museum which were part of a larger collection of photographs used for teaching purposes at a small New York preparatory school in the 1880's. I was urged by my husband , a computer engineer, to have many of them digitized at low resolution so that they could be published possibly as an "e-book" and at high resolution so that I

could more easily catalogue and study them without constant handling of the originals. One of the photographs was of a gallery in the Vatican, at the end of which stood a large, black marble urn. In the original photograph, the urn was unremarkable. But when the photograph was digitized to a high resolution, I was able to zoom in on specific details. My original intent had been to enlarge portions of the image so that I could more easily identify the statues on display in the gallery. Imagine my surprise when I realized that the figure of the photographer bending over his camera was reflected on the shiny black surface of the urn, an object which heretofore I had dismissed as unexceptional and without any interest.

My last example comes from an article published in *The Chronicle of Higher Education* on the way in which "(t)echnology is reshaping literary scholarship on such Melville classics as *Moby- Dick*" (Howard 2006, A14). Prof. Olsen-Smith on the English faculty of Boise State University discovered in the Harvard's Houghton Library that a book formerly part of Melville's personal library contained marginalia and marked passages by the famous author. The book, Beale's *Natural History of the Sperm Whale* was one of the important sources Melville used in writing *Moby-Dick.* Unfortunately much of the marginalia, written in pencil, had been erased in the course of its fortunes from Melville's library to its current resting place. However, with the aid of computer enhancement some of Melville's remarks were recoverable providing scholars with important insights into Melville's creative process.

The current discovery of a palimpsest containing a lost work of the Greek mathematician, Archimedes and its subsequent recovery solely through computer technology has recently been the feature of several PBS programs all of which illustrate the importance of collaboration between humanities professionals and computer scientists.

These few examples amply testify to the importance of such collaborations and point towards a future where such collaborative efforts will increase. If these collaborations are buttressed by a mutual understanding instituted at any early stage of educational and scholarly development, they can only lead to more rewarding and enjoyable research.

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