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Editorial

Peter Wegner and Peter Richardson
Editors

This late first issue of the Faculty Bulletin includes 8 articles. We are pleased with the article by President Ruth Simmons and the contribution of Provost David Kertzer about the growth of the University, and have included three articles by the editors to supplement three articles by faculty. We hope that in 2008 we will receive a sufficient number of articles submitted by our colleagues so that we can publish the 2008 Spring and Fall issues more timely, as in previous years.

Ruth Simmons reviews methods of analysis of the academic enrichment plan so that the Corporation, the faculty, and outsiders can judge its current status and potential plans for its progress and evolution. Topics for analysis and review include curricular diversity, faculty and administration growth, departmental strengths, medical program advances, and whether we are trying to do too much or too little. She implies that our analysis will help us to better understand the growth and quality of the academic enrichment program.

David Kertzer examines the contributions of department chairs to the evolution of their departments. Chairs should possess a clear vision and plan for departmental growth, and ensure that the quality of teaching, research, and services be maintained by the faculty. They should enlist the support of colleagues in departmental objectives, while working actively with the administration, and ensuring that individual faculty meet university requirements and student needs. Department chairs should possess leadership, judgment, and skills in meeting their local and university goals. They should let sleeping dogs lie where necessary, while performing actions that contribute to the goals of both their departments and the university.

Ruth Colwill, the Chair of the Faculty, suggests that Brown's success as an institution is related to the boldness of its goals and expectations. Our University goals have included questioning orthodoxy, celebrating freedom of expression, and promoting internationalization. Our substantive bold changes have included revising our curriculum in 1969, changing the system of faculty governance, changing our social structure through academic enrichment, and accepting a woman president and women faculty chairs to organize and expand our growth and leadership. Ruth Colwill's analysis of faculty goals complements Ruth Simmons' analysis of institutional goals and David Kertzer's analysis of departmental goals.

Julius Kling explores the long history of psychology at Brown, first taught by Wayland and Andrews in the 19th century, subsequently established with a laboratory in the early 20th century, and transformed into a department in the mid 20th century. The department of Cognitive and Linguistic sciences (CLS) has interacted with students and faculty of the Psychology Department and the two departments will be combined into a single department of CLS and psychology in a few years. We hope this article is an early example of several for the Faculty Bulletin describing the history and evolution of departments, centers and programs at Brown, as we approach our 250th Anniversary.

Peter Wegner discusses the work of Peter Lipton, Chair of the Department of History and Philosophy of Science at Cambridge, who died tragically of a heart attack in November 2007 at age 53. His article "The Truth about Science", presented as a Medawar lecture at the Royal Society in 2004, evaluates the notion of scientific truth in terms of ideas proposed by Karl Popper, Thomas Kuhn, and other philosophers. His views relate closely to Peter Wegner's own ideas about the nature of scientific and philosophical truth.

Leslie Bostrom and Peter Richardson present distinct ideas about the impact of birds on human beings. Leslie, a professor of visual arts, has been working on a series of large landscape paintings titled a "Bird Disaster Series" that exhibits birds in the presence of disasters. Her current painting shows people in a house throwing toys out of an open window raining down on birds in the garden, while two Cardinals perched nearby are looking on. Peter Richardson explores interactions between birds and people starting from his own youth in England, with the chance local geographic link with Ralph Vaughan Williams's Lark Ascending, to the scientific studies (especially regarding bird flight and its mechanics) from Leonardo da Vinci to recent times for investigators at Brown and elsewhere.

The final article, by Peter Richardson, reflects efficient use of energy resources with autos and inferentially on the parking problem. The heart of it is to point out the under-recognized effects of starting engines from cold, in summer as well as winter, which he explains can be quite costly in gasoline. Recognition of this may alter patterns of use of automobiles.

Faculty Meeting Remarks Academic Enrichment

**Ruth J. Simmons
President**

Good afternoon. As this semester speeds by, I am acutely aware that there are many issues that we have in front of us that must get done somehow among all the other things that we must attend to. Every year, usually at a particularly intense moment in the semester, I ask whether we are trying to do too much. Predictably, I begin this year with the same question. Posing that question periodically enforces a modicum of discipline in the face of the imperative to add on to what we are doing. That imperative can soften into a kind of aimless drift if we are not careful of the decisions we make and if we fail to engage in the kind of on-going review so necessary to high quality efforts. So, I want to begin by discussing a process that began last year and is still under way that encompasses that kind of ongoing critique of what we are doing, the degree of effectiveness of the work, and the prospects for success if we continue on the current path.

Last year, nearing the fifth year of the Plan, we continued to hear about new academic and other needs. With an understanding that no budget can bear a limitless succession of good ideas being implemented, I began asking that we not only look to adding items to the Plan and the Campaign but also to assessing whether we have confidence that we have identified the right set of initiatives. I asked the Provost and the deans to work through their committees and advisory groups to pose and answer that question. What did we undertake that has done less well than expected? What are the opportunities that we declined to pursue that might have produced a promising outcome? Without abandoning ventures that have insufficiently matured, what have we learned that might influence the next steps in the Plan?

At the time the Plan was approved, we agreed to report to the Corporation in a timely way about how the investments we are making affect the quality of the academic program at Brown. While we can point to net additions to the faculty that should result in increased curricular diversity and offerings, reduced average class size and a more favorable student-faculty ratio, there is much more to improving the overall environment for teaching, research and learning. I don't need to repeat them all here but space issues, student life facilities, competitive salaries and benefits, an up to date physical plant and so many other factors impinge on the success of any academic strategic plan. One question that I certainly muse about is whether the combinations of investments across these areas are sufficiently focused to have the desired impact. Yes, we have improved our standing in some areas but have we made targeted improvements at a depth that will be decisive for its impact on our academic programs?

We have an obligation to report to the Corporation in the course of this year on the Plan to date. Part of that report should address the question of whether we are on the right course with regard to academic enrichment overall and with respect to specific programs within the Plan. We should not fear these questions but see them as a sign of strength. Where we identify the need for a change in direction, we should also identify how we would redirect resources to those areas. Of course, it is always easiest to

continue to add to our base. It is not only much harder but also more painful and disruptive to sort out what we should STOP doing. Yet, this is something that any healthy university must consider.

In a cycle that is frequently routine and demanding, we are expected to review all academic programs. This process includes bringing experts to campus in various fields, asking for their assessment of our strengths and weaknesses, and receiving advice about what would make these programs stronger. We do this even with our strongest programs. We also have a ten-year assessment of overall institutional effectiveness through the re-accrediting process. However, there is no regular cycle of assessment of administrative units. So, this process should also include asking questions about our administrative strengths and weaknesses. Do we have the right size and mix of programs to support our academic initiatives? Do they exist to serve our academic mission or have they developed separate and unrelated missions? How can we turn them to their primary purpose? Where growth and expansion have occurred, are there direct and demonstrable benefits of that growth that relate specifically to an improvement in teaching, learning and research? It is often difficult to stem excessive administrative growth and I want to be sure that we are looking at this issue very closely as we assess where we are and what resources can be deployed to our highest needs.

On the academic side, we are obviously in a very good position to gather a good deal of useful information. Current efforts through committees on undergraduate and graduate education should give us much food for thought in regard to our needs and opportunities in teaching and research. And of course we have been through a number of studies of the Medical division and the kinds of opportunities we face on that front. In the final analysis as we think about the next phase of the Plan, I am concerned that all of these efforts point in a coherent direction, particularly with regard to how we might maximize resources (human, capital and otherwise) to have the desired impact on the excellence, effectiveness and impact of our mission.

Another question that I think is quite important to air is whether we have paid adequate attention to strong departments that have the capacity for excellence. If not, what adjustments can and should we make now to assure that this is being done? How can these efforts be funded? There are additional questions that we should no doubt pose in this process of assessing where we are and we are counting on the committees that you have elected and the department chairs to inform the next stage of the Plan.

Again, it is my hope that these discussions will go on throughout the fall through various venues identified for these topics: the APC, URC, Faculty Affairs, Department Chairs and many others charged with these tasks. I met with the URC recently to discuss their involvement in this process, the Cabinet discussed these issues at a retreat in August, and others will take up these questions in the course of their varied missions.

In February, as we submit next year's proposed budget to the Corporation and as the graduate and undergraduate committees report on their work, I expect that we will have more to say about how we are doing in regard to answering some of these questions. I encourage your thoughts about this process.

The Role of the Chair

David I. Kertzer
Provost

In the sixteen months since I made the transition from department chair to Provost, I have often reflected on the role that department chairs—and heads of other academic units-- play at Brown. I am more convinced than ever of the centrality of the chair in ensuring that Brown achieves the level of academic excellence that we aim for. At a recent monthly chairs' meeting, following some unscripted comments I made on this subject, I was asked if I would set some of these thoughts down so that they could be more widely shared.

The department chair is responsible for a vast array of responsibilities, many of which are spelled out in the University's Academic Handbook. I would like here to focus on two central dimensions of the successful chair that I fear may too often be neglected among the welter of chairs' other responsibilities. What I have in mind are (1) the need to formulate a clear vision and articulate a clear plan for how the department can be as good as it can be; and (2) the need to take action to ensure that the highest quality of teaching, research, and service is maintained in the department.

If chairs have not uniformly seen their jobs in these terms, they can perhaps be forgiven. Most academic department chairs are faculty members who have, in one way or another, had leadership responsibilities thrust upon them—typically through the connivance of the dean and of their departmental colleagues, whose confidential opinions are solicited before such appointments are made. And most chairs, having agreed with some mixture of enthusiasm and reluctance to serve, see themselves in this role for a defined, predictable, and relatively short period of time (here I exclude our hospital-based department chairs, who follow a different tradition). Few campaign for the job, few hope that their term of office will be extended indefinitely, for like the rest of the faculty their professional existence is more often defined by their teaching and scholarly activities, rather than through their administrative accomplishments.

Most chairs begin their terms without a specific agenda that they wish to pursue—aside, perhaps, from the generic desire to see the department flourish. New chairs quickly find themselves dealing with a host of issues that they may never have had to confront before, from managing a budget and staff, to mediating disputes among colleagues, to negotiating with the administration for more resources, FTEs, space, TAs, or other necessities of academic life. It is understandable that after a year or so some chairs are tempted to equate survival with success and begin to look forward to the day when these burdens will fall on other shoulders.

At this moment in Brown's evolution, however, we should aspire to a higher standard than simply assuring that the required courses are taught, that searches conclude successfully, that concentrators and graduate students complete their work without undue difficulty. We need to recognize that each academic unit is the University in microcosm, and our ambition as an academic institution depends in good part on the cumulation of the ambitions articulated in our departments and centers.

The Vision Thing

Our academic units—be they departments or centers or others—can only achieve excellence through excellent leadership. They can only become as strong as we would like them to be through a vision that is well articulated and based on a clear-eyed analysis of the field nationally and of the resources available at Brown (including resources that could be made available). How are chairs supposed to achieve this? Certainly the chair has to be well acquainted with all aspects of the department and has to involve colleagues in planning and assessment. But unless these efforts involve the frank appraisal of the weaknesses in the department they are unlikely to be terribly productive. In any case, developing a vision for a department (or interdisciplinary center) is not the same as taking a poll of what all one's colleagues would like to see and simply summing up the requests. This is not leadership. For this a chair is not needed; a survey researcher would be better suited for the task.

This then is the basic conundrum chairs face. It is not in the culture of many departments to support such assertions of leadership, and in fact attempts to lead in this way may be met by resistance and resentment. The fact that the chair serves a relatively brief period, along with our strong democratic tradition on the faculty, makes the development of such a strategic plan difficult. Furthermore, unless the vision articulated by the chair is shared among at least a significant portion of department members, it is difficult to see how it could ever be put into effect.

To put the matter bluntly: Chairs alone cannot create a vision for their departments. Colleagues must support them in this effort, but without leadership from the chair such a vision rarely emerges. Achieving 100% agreement with such a plan, with such a vision, clearly would make the task easier, but it is in many cases an unrealistic goal. Someone is likely to have an alternative idea of priorities and possibilities. Chairs who wait until everyone is behind their plan renounce their responsibility to exercise leadership.

Among the questions that the chair needs to pose is what it would take to make the department more prominent nationally and internationally and hence attract the best faculty and the best students. In many cases, this is likely to involve identifying important areas within the discipline where the department can be outstanding. It may often be the case that the best strategy for attaining such national visibility and quality involves taking advantage of the strengths found elsewhere at Brown—whether in other departments, interdisciplinary centers, institutes, or programs, or through various scholarly or other resources available at the University.

Sleeping Dogs and Rocking Boats

Letting sleeping dogs lie is an enticing motto for the new department chair. For the same reason that it is difficult to articulate a vision which, inevitably, involves strategic choices that risk antagonizing some colleagues, the chair is loathe to rock the boat. Who wants to incur the wrath of colleagues by suggesting that they are not doing their work—whether teaching, research, or service-- at the level that we should expect of all Brown faculty? But chairs who turn a blind eye to areas of poor performance are not

doing their jobs. In some cases, such problems are attributable to the fact that no one had previously clearly explained university expectations to the faculty or staff member involved. A recent case came to light, for example, of a junior faculty member who cancelled a series of classes so that she could go around the country giving professional papers. Hopefully, as in this case, as soon as such a report comes in, the chair explains that this is unacceptable and the problem is rectified. But of course not all cases are so easy, not all are simply matters of better communication of university norms. There are many aspects of this question. For example, resources at Brown, as at any university, are finite, and it is the job of the department chair to ensure that they are distributed in a way that is not only equitable but also designed to contribute the most to the teaching and research mission of the university. Laboratory space is one such resource. Space that is not being used productively cannot be allowed to remain that way simply because reassigning it would anger a faculty member. Or, to give another example, faculty members who teach certain courses because they have always taught those courses, regardless of student demands and teaching needs in the department, require intervention from the chair.

The Importance of Departmental Leadership

What these two duties of the chair have in common is that together their performance helps us make Brown stronger. The result is attracting the best undergraduate and graduate students we can, at the same time as we bolster our role as a major center for the production of knowledge and for the arts. Of course no one can perform the role I have outlined here without strong support from departmental colleagues. Leadership in this sense must always be collective, and collegial. Nor can the chair be effective in strengthening the department without the support of the central administration. Once the administration sees that the department chair has articulated a compelling vision and has taken action to ensure high standards, it is the administration's job to help find the resources required to strengthen the department. As we look back on all of the progress that we have made in the past few years in strengthening our faculty, our departments, and our interdisciplinary programs through the resources provided through the Plan for Academic Enrichment, we need to keep up our momentum, to articulate plans, department by department, program by program, to become even stronger.

Being Bold, Being Brown

**Ruth M. Colwill
Chair of the Faculty/FEC**

For my generation at least, “Boldly Brown” predictably triggers a memory of that most infamous split infinitive which, throughout my impressionable years, heralded a weekly exploration of the final frontier. What genius that we should associate Brown with challenging the conventional and pioneering investigation of universal unknowns! Unique among her Ivy peers, Brown’s open curriculum and longstanding commitment to faculty-student partnerships have fostered a collaborative culture that embraces individual differences and nurtures talent and entrepreneurship. In this essay, I will argue that we must resist recent pressure, both internal and external, to standardize. Uta Hagen recognized the real and present danger of standardization: *We must overcome the notion that we must be regular...it robs you of the chance to be extraordinary and leads you to the mediocre.* Brown is not a regular school and what we do and the way we do it are not standard. Conforming to peer notions of what a university should be will suffocate our spirit and propel us into a black hole of anonymity. But while we must carefully protect those idiosyncrasies and practices that define our identity and culture, I also consider it necessary for us to ensure that each generation of students and faculty remains free to find its way. It’s not easy to challenge orthodoxies, but that is, I think, what Brown is known for. I want our legacy to be a world-class academic institution that respectfully celebrates freedom of expression, joyfully cultivates critical, reflective discourse, and ardently encourages innovative solutions to global challenges of unprecedented magnitude: sustainable and renewable energy sources for emerging economies; climate changes and environmental pollution; health, economic and educational disparities; and public scientific and technological illiteracy.

Brown’s success as an institution of higher education has defied the odds for years. With barely a shadow of the endowment of her Ivy peers, Brown has nevertheless engineered a coveted intellectual climate that attracts and sustains individualism. Both students and faculty are generally comfortable with the idea of being different and, equally important, with the consequences of being different. The College epitomizes this independent spirit. A magnet for independent minds, entrepreneurial talent and the socially responsible, the signature curriculum, eclectic grading scheme, and eleemosynary graduation requirements have conspired to create a sanctuary for intellectual risk-taking and scholarly diversification. Navigating this system has its challenges but its graduates live gloriously amazing lives and have been well prepared to confront the slings and arrows of life after Brown. It is of course only natural that conventional people find unconventional people threatening; humans, like other animals, are biologically wired to be suspicious of the unfamiliar. I see two insidious threats to the unique character of the Brown curriculum: Banner and Spellings. The first was disguised as technological advancement but in practice has already resulted in subtle assaults on the culture of course selection, registration and evaluation. The second is touted as legitimate accountability to a public increasingly indignant and anxious about the soaring costs of higher education. We must, as a faculty, be vigilant about how Brown responds to the latest federal exercise to measure the value of a college degree. Given the disastrous

consequences of product assessment on the K-12 educational systems, this produce of the Beltway may be even more nefarious than the colossal software dinosaur with its insatiable appetite for Ben Franklins. In either case, as we ponder the effect of standardization on Brown, we would be well advised to heed jazz musician James T Ellison's warning that *the real death of America will come when everyone is alike*.

Lest you now think I am one of those neophobic stick-in-the-mud fuddy-duddies lamenting the passing of the good old days, let me hasten to add that I am all for the idea of change and eager to be responsive to change. I agree with Darwin who understood better than most that change is part of the natural order; it's a fact of life. To steal his thunder, *it is not the strongest of the species nor the most intelligent, but the most responsive to change that survives*. Whereas Darwinian change is mindless and arbitrary, human directed change should be anything but. With our superior ability to contemplate the consequences of our actions, human beings have the obligation to think through the consequences of their decisions to implement change. Human-wrought change must be mindful and mistakes, which are inevitable, must be admitted and corrected. Because we are as a species in the unique position of directing change, we can preserve what is best about the past and enhance it through improvements in the present. Brown has made some good changes. We eliminated any and all physical education requirements for graduation including the requirement that women students would be photographed in their underwear. We have appointed women professors to the faculty and we are the first Ivy League institution to welcome an African-American woman as President. But our record is not without its blind spots, and those have cruel consequences. One that comes immediately to mind: The recent policy changes in graduate student support. Announcing the implementation of a new academic policy without any consultation of the faculty is scandalous; insisting on a "one-size-fits-all" philosophy for a process as diverse as the one that had evolved at Brown is destructive. What is especially distressing to many of us about the new policy is that its proponents genuinely think they are acting in the best interests of the university and the faculty - they just won't consider any evidence that indicates they are not. This problem should tell us that we need to devise and adopt principles for determining and implementing administrative change: transparency, communication and working from the ground up are, I'm convinced, the best way of doing so at Brown.

In the late 1960s, there was a movement to change the undergraduate curriculum. It was a bold idea championed by the undergraduate students and supported by the faculty and administration. After a period of intense, open debate, the faculty voted to adopt the new curriculum. What a momentous occasion! Goethe was right. There really is power, genius and magic in being bold. Decades later, there was a movement to change the system of faculty governance. Under the guise of making committee service more meaningful and improving the quality of decision-making by involving the faculty, the faculty governance system was overhauled in 2003. Four years later, we are still tinkering with the details to get this one right. But I believe we are almost there. So where will the next big move come from? I hope that our graduate students and the faculty committed to teaching them will step forward with a vision for graduate education that will give weight and meaning to the term university-college. Einstein put it in a nutshell when he said that *everything that is really great and inspiring is created by the individual who can labor in freedom*.

Within a year of her arrival at Brown, President Simmons provided the faculty with a gift when she created the Plan for Academic Enrichment – a vision; with her tireless and monumentally successful efforts to raise funds, she has provided the faculty with a second gift – the means; and most recently, she has provided us with a third gift – an invitation to control the next phase in Brown’s future. The Faculty Executive Committee has responded to this invitation with its report on the review of the Plan to which many of you contributed ideas and words, contributions for which we are all very grateful. I urge each of you to become a part of Brown’s history by attending the University Faculty Meeting on February 5 and adding your voice to those that will shape the set of bold academic priorities to guide the continuing evolution of Brown University. As the transatlantic poet Robert Frost said, *Freedom lies in being bold*. We, the Brown faculty, need to resist conformity and show by example the rich tapestry of knowledge, experience and opportunity that comes with diversity and respect for individual freedom. As we define ourselves as a truly international institution, let us not forget what we have been and let us remain true to that independent spirit. This will be no easy matter. To quote the immortal words of ee cummings: *To be nobody but yourself in a world that's doing its best to make you somebody else, is to fight the hardest battle you are ever going to fight. Never stop fighting.*

Another Century for Brown University Psychology

Julius W. Kling
Professor Emeritus of Psychology

Brown University is now in its third century of the research and teaching of scientific psychology. The field has had an interesting local history, and it is soon to enter still another phase in its development. Thus, this might be an appropriate moment to glance back at our history and, perhaps, to ponder the future.

As with all academic units, this department has reflected its local environment. Brown was, and to a degree remains a relatively small institution with aspirations that exceed its resources. Its individual programs and departments not only must compete for support within the university but they must compete with their counterparts in universities that typically are much larger and thus in a position to be better known. The relative success of Brown's graduate and research programs has come as a result of focused efforts: psychology, for example, was able to gain national recognition in the last century by focusing its efforts on experimental psychology, broadly defined.

Experimental psychology was a 19th Century creation. However, before that development, the philosophical approach to mind was well represented in the curriculum at Brown. From 1827 to 1855, President Francis Wayland taught the Senior Class a year-long course in moral and intellectual philosophy, introducing them to both the classical and the more contemporary writings on such topics as sensing and perceiving, remembering and forgetting, and the association of ideas (1). In 1889, when Elisha Benjamin Andrews assumed the presidency, the students were for the first time being taught by a philosopher who was thoroughly familiar with the newer methods of psychological investigation. Andrews expanded Brown's curriculum in a number of areas (2), including the hiring of E. B. Delabarre to establish a psychological laboratory. There also was the allotment of funds for equipment (to be shared with Physics), the assignment of three rooms in Wilson Lab for research and instruction, and permission to accept master's candidates into the lab

After the Andrews' years, Brown psychology grew slowly but made no important qualitative changes. In the mid-1920s, however, the economy was booming, colleges everywhere were prospering, Brown had been to the Rose Bowl, and our undergraduate enrollments warranted some expansion of the faculty. Leonard Carmichael, a young Princeton professor, replaced Delabarre as Director of the Laboratory, and a separate Department of Psychology was spun off from Philosophy.

Carmichael was an indefatigable organizer, recruiter, and publicist: he established his own research program (nature-nurture influences on sensory structures and functions), he re-organized the undergraduate curriculum, he set up a new graduate program and recruited a small but highly qualified set of graduate students, he established good working relationships with Butler Hospital and Bradley Home, and he put Brown on the psychological map by virtue of the publications of the faculty and the students.

Carmichael's research and his organizational abilities were widely recognized, and in 1936 he left Brown for a series of positions that included the presidency of Tufts University, and then appointment as the Secretary of the Smithsonian Institution. (As a retirement job, he later accepted the position of Director of Research of the National Geographic Society!).

On Carmichael's resignation, Brown called Walter Hunter from Clark University. Clark was at that time a small powerhouse of psychology, and Hunter was one of the nation's best known experimental psychologists. He had founded the Psychological Abstracts (in 1926), which he brought to Brown; he had been the president of the American Psychological Association and he was a member of the National Academy of Sciences. Hunter extended the reputation of Brown psychology by judicious selection of young faculty members (four of whom later were elected to the National Academy of Sciences) and of graduate students (four from that group also been elected). During the Hunter years, the department had about 10 faculty members and 15 graduate students (3).

The department grew during the 1950s, slowly at first, as Brown made a small increase in its student enrollments and in its faculty. John D. Rockefeller, Jr. gave Brown funds for a new Psychology building, and then the launching of Sputnik produced greatly increased federal contributions to research and graduate education. From such federal funds, we received the matching construction grant that made possible a larger and better-equipped lab, and the department collectively and students individually obtained grant and fellowship funds that allowed a substantial increase in the graduate program. By 1970, the department had about 18 FTEs and 45 graduate students. At the same time, undergraduate enrollments swelled to where we were running undergraduate lab sections almost every evening and make-up sections Saturday mornings. Although overall enrollments now are significantly smaller, the yearly number of senior concentrators then and now remains about 100.

A factor in the development of the Psychology Department that must not be overlooked is the remarkable influx of women into academia, and especially into psychology. Before 1940, women made up about 10 percent of American psychologists, with very limited opportunities for active academic careers. Today 50% of PhDs awarded in psychology go to women, and they fill positions of every type at every level. That change has raised the intellectual level of the field and broadened the perspectives from which research and education are approached.

Another recent and major factor influencing psychology at Brown was the decision to establish a department of Cognitive and Linguistic Sciences (CLS). The Psychology Department by 1980t had outgrown Hunter Lab, and the research and teaching interests of some of the faculty had branched out beyond the sphere of "experimental psychology, broadly defined." There was a strong research group working within the new Center for Cognitive Sciences. Some professors were questioning long-accepted departmental guidelines such as a core set of graduate courses and the nature of the doctoral dissertation. Some just didn't like to be called "psychologist" (4). There also developed a few difficult inter-personal relationships. Brown University was in the midst of the enthusiastic creation of new concentration programs, and of new departments and centers and institutes.

Brown's internationally recognized Department of Linguistics was facing the retirement of a number of their distinguished faculty. Psychologists and linguists had been exploring new collaborations. A proposal for a new department was welcomed and CLS was adopted as their new home base by a half dozen members of the Psychology Department. As a result, a psychology department that already was small by national standards became even smaller. In the next 20 years, faculty additions to the new department brought another half dozen productive research psychologists to Brown. For the University, the establishment of a new and vigorous department has been a positive factor; while the depletion of resources from an established department (by non-replacement of retirees, for example) has diminished its national impact.

In recent years it has become clear that the distribution of resources across the two departments has made the university somewhat less competitive than its peer institutions in such areas as recruitment of graduate students and the pursuit of certain research funds. It also seems that undergraduate students would be better served by combining the resources of CLS and Psych. Various study groups and visiting committees have offered their evaluations, and recently the two departments have been informed by the Administration that (a) the departments should move, through various stages of joint undertakings (i.e., combined graduate student recruiting) to reach full unification by June, 2010 into a new department to be named the Department of Cognitive, Linguistic, and Psychological Sciences. Inasmuch as some faculty members in each department already have shared research efforts and have been jointly mentoring graduate and undergraduate students, this process should proceed smoothly. The departments also have been informed that a new building will be ready for occupancy by June 2010, with Hunter Lab to be renovated for occupation by another department.

And so the academic evolution continues. Those psychologists (by any name) who hope that they may live in exciting times are having their hopes fulfilled.

1. The influence of Wayland's *Elements of Intellectual Philosophy* is shown by its sale of over 70,000 copies in its various editions, at a time when colleges enrolled relatively few students. For example, Brown's *total* enrollment in mid-19th century was about 250 students, and Harvard's was not much larger. Bronson, W. C. *The History of Brown University, 1764-1914*. Providence: Brown University, 1914.

2. Among Andrews' other changes, he pushed and tugged until the Corporation approved The Women's Program (eventually named Pembroke College), with the first students entering in 1891-92. Cf. Bronson, pp. 449-458.

3. Psychology (and most other departments) followed the staffing model favored by President Wriston: a few outstanding scholars surrounded by untenured young colleagues who used their Brown appointments to get their careers off to a good start. Wriston, H. M. *The Size of Brown University*. Providence: Brown University, 1946.

4. Not just a local trend. Note that the N.Y. Times 11/01/07 "obituary" of the chimpanzee Washoe, identified the psychologists who worked on the chimpanzee projects as "cognitive researchers".

**The Truth about Science, Peter Lipton
Royal Society Medawar Lecture, 2004**

**Peter Wegner
Professor Emeritus of Computer Science**

Peter Lipton, Chair of the Department of History and Philosophy of Science at Cambridge University, died tragically of a heart attack in late Nov 2007 at age 53. I knew him well and visited him both at Williams College in the late 1980s and at his home in Cambridge in 2005. His seminars were said to resemble those of A. J. Ayer, his PhD advisor at Oxford in the early 1980s, whose seminars I had attended at University College London as an undergraduate in the 1950s. He is renowned for his account of scientific inference and explanation in his book "Inference to the Best Explanation (1991)". I review here his recent article, "The Truth about Science" presented as a Medawar lecture at the Royal Society in 2004, and published in "Philosophical Transactions" in June 2005. In this article Lipton examines scientific hostility to the philosophical analysis of science, the philosophical ideas of Karl Popper and Thomas Kuhn, and his own opinions on the contributions and shortcomings of philosophy.

Philosophers try to account for how science works and what it achieves rather than to gain new scientific knowledge. However, science can be hard to explain by mere description, just as one cannot explain how to ride a bike by simply describing the behavior of the cyclist. Lipton cites three reasons why scientists might disdain the philosophy of science: because it gets science wrong, because it is useless, and because philosophical description is pernicious. There is an element of truth in all three suggestions, but even wrong and useless assertions can contribute worthwhile intuitions about the substance and limitations of research, and pernicious findings may suggest substantive changes in the description and form of scientific thought.

According to Lipton, there are three models of what science can be expected to achieve, namely realism, instrumentalism, and projectionism. Realism focuses on accurate and comprehensive description of both the observable and unobservable world. Instrumentalism focuses on the use of devices, like computers, to perform tasks and make scientific predictions. Projectionism differentiates between inherent realism and human interpretation of observations, as in the distinction between primary properties like size, shape, and mass, and secondary properties like color. For example, a well-constructed bridge involves both primary realist properties such as size and weight supporting its use and secondary (projectionist) properties such as beauty and color that express visual rather than supportive properties.

Karl Popper and Thomas Kuhn are among the most distinguished philosophers of science of the 20th century. Both are "hedgehogs" with a single big idea rather than "foxes" with many small ideas. Popper focuses on the principle that universal truths, such as the idea that all swans are white, can never be proved because we cannot show that non-white swans do not exist, no matter how hard we try. This argument implies that universal truths cannot generally be proved and that our principles of scientific truth may therefore be seriously flawed, even when experimentally testable. For example, a bridge claimed to be adequately constructed for normal use may be flawed since it could be destroyed by unforeseen (untestable) floods or hurricanes.

Thomas Kuhn's big idea is that scientific revolutions are generated by paradigm shifts that transform normal scientific research into a new form, based on new exemplars (forms of problem solving) that change our model of the world and our notion of truth. Paradigm shifts occur because of flaws in a current paradigm that may include flaws in the truth or realism of scientific assertions. In fact Popperian flaws in the model of truth and Kuhnian flaws in the notion of paradigm are related in the sense that both express scientific flaws in our ability to express and describe the status of the world. Inadequate expressiveness of scientific models may be due not only to views defined by Popper and Kuhn, but may follow from a broader exaggeration of the philosophical quality of our reasoning and our scientific thought processes.

Lipton's philosophical arguments indicate that both Hume's and Kant's philosophical assertions about science are flawed and may have pernicious consequences. Hume's scepticism about the causality of behavior leads him to a more general scepticism about the contributions of experience and observation to scientific understanding that eliminate empirical observation as a scientific mode of explanation. Kant's "Critique of Pure Reason" argues that our judgment should be based entirely on a priori insight and that the mind should exclude empirical results that differ from a priori mental beliefs about science, politics, and religion, for example about the existence of God. Lipton agrees with Bertrand Russell, as do I, that scientists should disapprove of both Hume's scepticism and Kant's a priori principle of "pure reason", while approving substantive empirical testing of propositions. However, disagreement with these two seventeenth-century philosophical assumptions does not imply rejection of all forms of philosophy.

Kuhn's "Structure" was questioned by both scientists and philosophers during the 20 years after its publication in 1962. Scientists questioned Kuhn's multiplicity of definitions of the term "paradigm" and the degree to which paradigm proposals and paradigm shifts offer a useful model of potential scientific progress even when initially rejected. Philosophers questioned incommensurability and incompleteness between paradigms, which completely destroy old modes of thought in creating new modes of thought, so that past philosophical principles and notions of truths are replaced by new principles that may in turn be proved wrong by a further paradigm shift.

According to Lipton, Kuhn's paradigms determine an "internalist" as opposed to realist model of the world, that propose new models of science with new notions of truth. Although we see colors as being "out there", there is a sense in which colors are an internalist projection of human experience rather than an inherent (realist) property of the world. Since most past theories about truth were shown to have been mistaken, it may be that most future theories will turn out to be false as well.

Lipton presents arguments for and against the role of realism as a basis for truth. Scientifically accepted theories such as phlogiston, the ether, and other mistaken realist assumptions have repeatedly been proved wrong, and Lipton argues that induction cannot generally be accepted, and that any widely accepted theory is likely to be wrong because all earlier widely accepted theories were eventually proved wrong. This is especially true of completeness arguments about the essence of physics, mathematics, computing, and other scientific disciplines, which were proposed unsuccessfully by Einstein, Hilbert, Turing, and other well-known scientists.

The above negative assumptions about Truth are, according to Lipton, an example of "judo epistemology", which uses past knowledge of falsehood of theories as a basis for

the interpretation of future theories. However the assumption that new theories correct and thereby falsify earlier theories seems inadequate, since new theories provide better and more accurate modes of analysis. Science is in the business of learning from its mistakes, and new theories in fact eliminate false prior arguments in favor of arguments more likely to be true, negating the assumption that past theories should serve as a basis for future interpretations.

The "miracle argument" for realism asserts that if experiments based on a theory show that all actual tests are valid (true), then complete correctness is possible and even probable. Predictive partial success is more likely to imply complete total success than later partial failure (incomplete success), suggesting that broadly tested realist models are more likely to be completely successful than unsuccessful. However, we cannot infer that most partially successful theories are completely true from prior success, since several partially successful theories were proved false by more complete later experiments.

Though early philosophers like Descartes and recent scientists like Hilbert and Einstein have tried to develop complete models of scientific disciplines, it has been shown that their models are generally incomplete and that complete truth or falsity of behavior are extremely hard to prove. The rationalist view that scientific understanding of truth or falsity of theorems can be developed by a priori models cannot in principle be realized, since human understanding of broad scientific principles is so often incomplete.

The incompleteness of mathematics and other sciences was proposed in 1930 by Kurt Godel, who showed that mathematical theorem proving was incomplete, negating Hilbert's assertions that all mathematical theorems were provable. I myself have explored incompleteness broadly, including Alan Turing's extension of mathematical incompleteness to models of computing, and further extensions of incompleteness to political and religious reasoning about ideas and actions. It is gratifying that Lipton developed a parallel belief about the limitations of completeness as a part of his understanding of philosophy. Peter Lipton's analysis of philosophical scientific ideas in his Medawar article provides one of the best discussions of this issue I have seen, and it is indeed a tragedy that such a great thinker died so prematurely.

The idea that humans can completely describe scientific, political, and religious principles has been overestimated ever since Plato's assertion in the "Republic" that philosophers should be kings, and his proposal that an undemocratic and inappropriate Utopia based on Spartan as opposed to Athenian rules should be our philosophical goal. It is surprising that Plato's Utopia was so widely praised as a philosophical masterpiece, when its substance was questionable. It seems that philosophers have erred in their scientific and political opinions and humans generally have consistently exaggerated the ability of philosophers, scientists, and politicians to describe the world correctly and/or completely. The utopian idea of making the world a better place is often proposed as a goal we would like to achieve, but this goal has proved unattainable because the world appears to be getting worse rather than better as its population expands. We would be interested in proposals or discussions about how society can contribute to making the world a better place from both older and younger members of the Brown community.

The Bird Disaster Series

Leslie Bostrom Program in Visual Art

“Landscape painting marks the stages in our conception of nature.” Kenneth Clark,
Landscape Into Art, p. 1

Since 2002 I have been working on a series of large landscape paintings titled *The Bird Disaster Series*. The works are spectacles of fantasy disaster that in which I depict operatic tragedies of the human/non-human relationship.

I employ this method:

I gather images, often drawing in the Rhode Island School of Design Nature Lab, which has a quality collection of stuffed bird specimens. Using a birding scope, I also draw in the field. I take digital photographs, and cut pictures from the newspaper and magazines. I collage these images together, moving pieces around until I have some compositions I like. Then I select a collage and paint several watercolor studies, trying out colors, lighting, and continuing to manipulate the composition. When I have an acceptable watercolor, I use a grid method to transfer it onto a large canvas (usually 90” x 108”). I paint the big picture in oils, usually in about 3-4 weeks.

In his *Aesthetic Theory* (1970), Chapter 4, Theodor Adorno traces a shift in emphasis from nature to art in theories of aesthetics in the 18th century. He positions this shift in aesthetic focus as parallel to the development of the philosophical Subject and theories of individual freedom. In other words, nature had to be relegated to an “other”- a possession or object outside the human- in order for the cherished concepts of human freedom and value to emerge. In the same chapter, he states that the creations of wilderness areas and national parks have created a “tokenistic” natural beauty for the contemporary consumer. Love of nature is not only a consumable pleasure, but a philosophical comfort. From *Aesthetic Theory*: “The progress of civilization gives people a false sense of security, concealing from them just how vulnerable they are, even today. Delight in nature is tied up with the notion of the subject as being-for-itself and potentially infinite.” (p.96) In the West, our habitual attitudes toward nature, both reverence and scorn, are woven both philosophically and economically into our concepts of self and well-being.

A landscape painting is an idealized, civilized depiction of an outdoor scene, revealing cultural attitudes and aspirations. My intention is to create anti-landscapes, using the *Disaster Series* to critique the landscape of the frontier, with its sub-text of imperial power, wilderness landscapes, representative of natural/spiritual purity, and the pastoral landscape, with its comforting nostalgia. My paintings counter these conceptions of nature as a separated refuge with the concept of an (un)nature unavoidably intertwined with human activity.

I choose to paint these anti-landscape narratives depicting birds because I have been watching them for about twenty years. Birds are visually and aurally beautiful and familiar to everyone. Because they fly, they seem exotic and free. Because they are

mostly small and light, they seem fragile. They are direct descendants of the dinosaurs, and yet because they make nests and walk on two legs, they resemble humans. In addition, there is a popular visual record of birds. Almost everyone is familiar with the “field guide”, an aesthetically seductive document of observation and classification. The “field guide” is a reassuring document that creates an order for animal and plant life, evidence of the advance of civilization as it emphasizes the birds’ exotic charms. In these paintings, I work against the orderliness and security of the field guide, depicting recognizable species in chaotic situations.

In my paintings, the birds are placed in the foreground, close and huge in the pictorial space. The birds are positioned so that the viewer will identify with them. The disaster that is happening to the birds is bad luck; they are in the wrong place at the wrong time. Their mortality, like ours, is inevitable. Unlike their ordered position in the field guide, they are threatened by chaos. Human activity is just another natural disaster.

The early paintings in this series were quite straightforward in their “disaster” depiction, propaganda-like in their illustration of environmental threats to birds. The cat creeps down the tree branch toward the nestlings. The chickadee flies into a window. The oil soaked grebe flounders among rocks with a sinking tanker in the background.

Recently I have been producing a more nuanced narrative, for example a painting of cowbirds in the suburbs. Brown-headed Cowbirds are nest parasites, native to the Great Plains, which have spread across the country because of the fragmentation of forests for development. The females now lay their eggs in the nests of birds that have not evolved to defend against them. Cowbird chicks hatch first and are larger and more aggressive than the other chicks. The cowbird has been partially responsible for the decline of many Eastern wood warbler populations.

Currently I am working on a picture that shows two cardinals perched in a bush below a large house at night. Somebody inside the house is throwing toys and appliances out an open window, and they are raining down on the birds. The “disaster” of course, is what is happening in the house. Civilization is literally falling on these birds. This scene is apocalyptic with an undercurrent of dark comedy. The male and female cardinals in the bush are the scene of domestic tranquility while what’s happening in the house is wild, untamed, nature.

Interaction with Birds

Peter D. Richardson
Professor of Engineering and Physiology

"Listening to birds: an anthropological approach to bird sounds." Dr. Whitehouse of Aberdeen University obtained funding to the tune of £200,000 (\$400,000) for this study, according to an item in the BBC website late in November 2007. And in the last weekend of January 2008 in the UK there's a national survey of birds: in 2007, 400,000 people counted 6 million birds in 236,000 gardens. Here, "Audubon" immediately conjures up bird paintings and sanctuaries. We cherish birds; we feed them, listen to them, observe them, wonder at their skills in navigation, and generally at what makes them tick.

Having grown up in the English countryside I can recall plenty of interactions with birds, with many times of mutual observation. Charlie, a baby cuckoo, was a raucous fledgling who would come outside my bedroom window one summer regularly about 6 a.m. demanding cherries. Running on the flat roof out there he would catch each of them on first bounce, spit out the stone, and ask for more. One time he flew in through the open window, looked around and flew out again. The jackdaws would not come so close, but also loved cherries. When a cherry landed near them they'd dance around as if to intimidate it into submission, then quickly eat it. Robins love worms from the garden, and when I was digging with a fork a robin would perch nearby waiting for worms to be turned up in the soil. Robins also learned from other birds: one winter I watched blue tits feeding from a rib left from a Sunday joint, which had been suspended like a pendulum bob on string - the blue tits were very adept at landing on it and pecking off soft tissue residues - and after nearly an hour the robin decided he'd try that, only to discover his greater weight made the pendulum swing wildly. He held on gamely, occasionally flicking his wings to try to improve motion control, only to discover he could not get his beak down close to his claws to nibble at the fat on the bone as the tits had done. Thrushes braved netting to seek strawberries, often needing to be cut free carefully so they could fly again. Our free-range domestic chickens each produced eggs of slightly different shapes, so we could keep track of their laying rates individually. The English blue jays kept their distance from people far more than on the East coast here. With parents who believed in plenty of fresh air, thus wanting windows left open in all seasons, night as well as day, I found there was ample opportunity to hear owls as well as the dawn chorus.

Deeper into the countryside other species could be found, and I recall a lark ascending over Walton Heath on a sunny summer's late afternoon, to which Ralph Vaughan Williams' popular violin piece is remarkably faithful. And why not? Walton is quite close to Leith Hill, where he had been taken to live as a 3-year old after his father died. Some people have speculated that Williams was inspired by a poem, but the real thing should have been inspiration enough. Some birds enjoy soaring in thermals - not only the professionals along the Blue Ridge Parkway, or at the lip of the Ngongoro Crater, but also shore birds given the evening chance by a sunny day over Antibes

providing thermals from building walls. Penguins that had learned to hydroplane on still water at San Diego Sea World seemed to do it just for fun too.

A few feet of hedgerow in Providence is summer home for many sparrows, and one has tried to converse - I imitate him, he replies at some length while sitting on a nearby branch, lets me respond, then takes his turn again, and so on. I wish I could interpret the structured sounds he produces.

Birds also seem keen on people-watching, and car-watching. Most of us must have noticed the birds that perch in long lines along wires that cross roads (especially interstates). Watching for road kill is a possibility, although conditions often provide too much traffic for safe retrieval. If they suppose the long lines of fast vehicles represent migration, they must ponder why it can occur in opposite directions, often in similar volumes, at the same time. In recent weekends I have found myself driving often on I-95 to I-495N, and have noticed that very many birds have sat on wires crossing the highway near the intersection with US 1A, where many cars coming from north and south peel off to head for the stadium where the Patriots play. Perhaps the birds are assessing cars to follow later to the stadium, to pick up left-overs from tailgate partying? But a few miles further north there are still plenty of birds on similar high wires.

Mechanics of the flight of birds have been studied for many years, Leonardo da Vinci keeping notes for 25 years five centuries ago that we can relate to today. Much work is relatively recent, with articles by Torkel Weis-Fogh in the early 1970s being widely cited regarding hovering flight (as found in humming birds) and the production of vortex-rings repeatedly expelled downwards - important with hovering insects as well. The chapter on Animal Flight in James Lighthill's book *Mathematical Biodynamics* (1975) includes this and some earlier studies of forward flight as illustrated by gulls and pigeons. Subsequent studies have been assisted by use of laser techniques to trace the dynamics shown by tiny particles in the air moving close to the wings. Ken Dial, of the University of Montana, has included studies of flap-bounding flight, and most recently birds' use of wings in climbing steep inclines; Ted Goslow (formerly at Brown) studied particularly the shoulders and the flight muscles; others have examined respiration in birds, and the energy economics of flight and V-formation flying (interesting particularly for migratory flights), even the minimum heights birds need to take shellfish above rocks to drop them and induce opening of the shells - and compare this with the heights birds actually carry them (which is quite close to what is needed), all the latter being of interest to see how well animals have learned to use close-to-minimum energy requirements in hunting and processing their foodstuffs. Some recent papers have sought to apply what is being learned to questions of the evolution of flight - even for us in airplanes, a fantastically successful mode of locomotion - and of its spread around the world. The spread has its own dynamic: an avian virus has led to world-wide concern.

Flying creatures provide an active field for interdisciplinary research at Brown, so for example you'll find images of (bat) flight in Computer Science's Cave, and experimental/ computational flow studies in BioMed and Engineering. Birds gather interests in art, music, literature, anthropology, ecology, anatomy, physiology, public health and other disciplines. Might these diverse viewpoints flock together better here?

Your Car, Your Gas Consumption, How to do Better

Peter D. Richardson
Professor of Engineering and Physiology

There's a competition on its way to design a car that can achieve 100 miles-per-gallon in road use, to be taken to competitive demonstration (Look for AXP Draft Competition Guide). We'd all like the savings to our wallets and the reduction of dependence on oil from foreign sources. But it is not here yet.

You can do better, even now with your present car, if you understand how your net miles-per-gallon is determined. Besides your individual style of driving there are three main factors which determine your gas consumption. One of these is how many miles you drive, of course. Another is the season, particularly whether it is summer or winter. The third, and very important, is how many times you start the engine from cold per gallon of gas. This is the one that is least well known, but very important.

For many years, I've kept and analyzed records (and occasionally published them). When my present car (a Volvo V40) has been warmed up it gives me 34 miles-per-gallon in the winter and 31 miles-per-gallon in the summer. The difference arises because the air-conditioner requires power, which is provided by the engine and increases the fuel consumption.

When you start a car from cold it takes a few minutes for the engine and various moving parts (including the tires, transmission, wheel bearings, and so on) to come up to their regular warm running conditions. This takes around seven minutes. If you left the car with the engine off for three hours or more, you'll be making a cold start. Each cold start and rolling along to the warmed-up condition requires extra fuel to be used, over and above the steady-running warmed-up consumption. For my car that is 0.133 gallons-per-cold-start in the winter. That may not sound like much. But it is equivalent to losing 4.5 miles I would have been able to cover with the same amount of gas if the car was warmed up. So if I make 2 cold starts per gallon in winter, I travel $34 - 9$ miles, which is 25 miles net for that gallon. If I make 3 cold starts per gallon, I travel $34 - 13.5 = 20.5$ miles per gallon. A big effect!

The mile-cost-equivalent is not so large in the summer. The gallons-per-cold-start of the V40 drops to 0.075, which is equivalent to 2.32 miles lost from warmed-up running conditions. With three cold starts per gallon, my net travel distance drops to close to 24 miles for that gallon, not as bad as in winter, but not a negligible percentage drop either.

Over the years, there have been reductions in the gallons-per-cold-start among the cars I have been driving. For my 1956 Plymouth the winter cost was 0.243 gallons, and in my 1960 Chevrolet it was 0.34 gallons (both had 6-cylinder engines). The Volvo V-40, at 0.133 gallons per cold start, is clearly more economical. The main reasons are the switch from the carbureted, automatic choke designs of the 1950s-1960s to the fuel-injection systems used now, a smaller, turbocharged engine producing as much power, and radial-ply tires in place of cross-ply. Experiments we performed in Prince Lab several years ago with a carbureted V-8 engine (cooled down with large ice-packs all over it, it looked as if it had the mother of all headaches) showed that at least half of the overall cold-start fuel cost occurred in the engine itself.

The most obvious conclusion is that if you want to improve your net miles-per-gallon, limit the number of cold-starts you make, which likely can be achieved by changes of a few habits (e.g. cutting down on impulsive shopping jaunts, and instead batching multiple shopping stops into single trips - hot re-starts are relatively costless in fuel; walking or biking when you can; and using your Brown card on RIPTA buses also to cut down on cold starts).

If you car-pool, another conclusion is that you may cut down on the number of cold starts if you do not have everyone drive to a common meeting point, then all drive in one car from there, but instead have just one cold-starter who drives round to pick everyone else up.

FACULTY BULLETIN
INFORMATION FOR CONTRIBUTORS

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A second issue of the *Faculty Bulletin* will be published later this spring.
Article should be submitted by **March 31, 2008**.

Please submit text electronically in Word format to:

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Articles should be approximately 1,000 words (two to three pages). If space permits, longer papers will be considered.

Articles and/or questions should be directed to:

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