FACULTY BULLETIN
TABLE OF CONTENTS
MAY 2015

PAGE

Editorial Introduction ................................................................. 2
   Peter Wegner and Peter Richardson, Editors

Three Poems .................................................................................. 3
   Felicia Nimue Ackerman, Professor of Philosophy

Urban Education Policy Program (UEP): Mission, Growth, and Impact .......... 4
   Kenneth Wong, Director of UEP, Annenberg Professor of Education Policy

Report of the Committee on Faculty Retirement (2015) .................................. 7
   Professor Barrett Hazeltine, Chair; edited by Professor Jack (John F) Hermance

Vergeltungswaffen: another Anniversary ................................................. 24
   Peter D. Richardson, Professor of Engineering and Physiology

Bertrand Russell’s History of Western Philosophy ....................................... 28
   Peter Wegner, Professor Emeritus of Computer Science

Two Nineteenth-Century Russian Authors ................................................. 34
   Peter Wegner, Professor Emeritus of Computer Science

A Half-Century of Introductory Books on Engines, Turbines and Thermodynamics:
An Unexpected Rise in Inaccuracy ....................................................... 35
   Peter D. Richardson, Professor Engineering and Physiology

Next Issue ....................................................................................... 43
Faculty members are well aware of our University-wide celebrations of the 250\textsuperscript{th} anniversary of the foundation of Brown. We begin this issue, the last in the span of these celebrations, with some verses by Felicia Nimue Ackerman, and hope there are some other poetic pens which will also feed our thoughts in the future.

Kenneth Wong describes and assesses the performance of the Urban Education Policy Program in the Department of Education. This Department has always needed to adjust continuously what is taught to future teachers and school principals. The US has experienced many policy shifts and Federal and State incentives and teacher-evaluation schemes in the past 50 years.

During the academic year now ending there had not been an opportunity to present the Report of the Committee on Faculty Retirement (chaired by Barrett Hazeltine) during a Faculty Meeting, and because retirement is something all faculty members must consider at some time, we are including it here as the Report is timely.

Peter Richardson has recalled an event of some decades ago, when he and Peter Wegner were studying (and surviving WW II) in the UK. On May 1\textsuperscript{st} 2015 Isabel Hull of Cornell came to give a lecture on breaking International Law in the Great War (WW I), and the name given to the weapon which landed opposite Peter Richardson’s then home (Revenge Weapon) raises the question of Law around acts of War again. So do many subsequent events, in which the attackers have more and more frequently directed attacks at civilians unequipped for defence.

Peter Wegner has provided two contributions, including a book review, one of his favorite métiers for this Bulletin. The first is of a book by Bertrand Russell, a long-lived British philosopher, mathematician and political activist; \textit{Russell’s History of Western Philosophy}. This History evolved from a course Russell gave in Philadelphia in the 1940s. Peter Wegner’s second contribution is a brief comparison between two 19\textsuperscript{th} Century Russian authors, Dostoevsky and Tolstoy, noting the similarities of thought in emphasis in their books on human conflicts, despite the very different social backgrounds of the authors.

Peter Richardson provides a different form of book review, critically comparing books spanning a half-century in origin and aimed at a specific university audience, yet where a simple iconic approach in making diagrams has led to some later books having distinct errors of fact being taught in them.

As usual, it should be understood that the views of the contributors are their own, and we acknowledge gratefully the energy and perseverance of Ms. Cheryl Moreau in helping gather the contributions.
Three Poems

Felicia Nimue Ackerman
Professor of Philosophy


On Shelley's Claim
"Poets are the unacknowledged legislators of the world"
If poets influenced our laws,
It mightn't be so good, because
Their views are sometimes less than sound --
Consider Eliot or Pound.

How Doth Professor Superstar
How doth Professor Superstar
Pursue his shining quest.
His glory awes us from afar.
He dwells atop the crest.

How cheerfully he seems to grin,
How neatly wields his clout,
To welcome all his cronies in
And keep outsiders out.

When Spousal Hiring Infects Universities
It's hard to resist
The urge to disparage
A man who gets hired
Because of his marriage.

And fairness, of course,
Is equally dead
When a man uses pull
And his wife gets ahead.

Unfairness and farce
Will later combine
If his wife's teaching follows
A feminist line.
Urban Education Policy Program (UEP): Mission, Growth, and Impact

Kenneth Wong
Director of UEP and
Annenberg Professor of Education Policy

The master’s program in Urban Education Policy (UEP) constitutes an important addition to the Department of Education in the last ten years. The academic mission of the UEP is to integrate social science theory and policy practice, along with exposure to both quantitative and qualitative research methods, to impart a set of core skills and competencies to students that are necessary for successful careers in urban education policy. The UEP program also provides a solid foundation for those anticipating advanced study in areas related to education policy, urban education, and public policy and management.

The goals of the UEP Program are to:

- Prepare the next generation of “change agents” to address the systemic problems of underperforming urban schools and districts;
- Empower graduates to engage in critical policy debates using the best available evidence and analytic tools;
- Train students to make policy decisions based on quality evidence and data;
- Facilitate student learning and promote professional growth in cohort-based, mentor-rich academic setting; and
- Contribute to policy improvement in urban education.

The UEP is an innovative collaboration between the Department of Education, a degree-granting academic unit, and the Annenberg Institute for School Reform (AISR), a think tank that advocates for reform actions. Integrating research and practice lays the foundation for this master’s degree program. Early in Ruth Simmons’s tenure as Brown’s president, she committed the University to improve coordination of the University’s resources to address the challenge of improving urban education. With the support of then Provost Robert Zimmer, the Education faculty and AISR senior staff engaged in a yearlong planning process that led to the creation of the UEP in 2005. The first class of 8 students matriculated in June 2006. Thirty UEP students earned their degree in May 2014. The UEP ranks among the top master’s degree programs in terms of enrollment in the Graduate School.

The UEP is a one-year master’s level program offered through the Education Department. It begins in June of each year. The tightly focused academic curriculum, integrated with a nine-month internship, is designed to impart a set of core skills and competencies that are necessary for successful careers in urban education policy. The program consists of ten courses: eight required core courses, including a required nine-month internship that counts as one course, and two elective courses. Beginning with the Class of 2016, the total number of courses is reduced from 10 to 9. The 9-course requirement will enable us to become more affordable and improve our competitive position in student recruitment among peer programs.
In addition to courses on school governance, urban systems, and human development, the program places a strong emphasis on building students’ quantitative research skills and aims to graduate students who are critical consumers of education research, able to assess whether the inferences authors draw are valid. All students develop a tool-kit of research methods – including familiarity with the Stata statistical package – so they can design and carry out their own quantitative research. Alumni comment that these skills have been helpful as they applied for their first job in education policy and research organizations.

The UEP internship is an intensive, field-based experience required of all UEP students. UEP students carefully choose their site with guidance from the Director of Education Outreach and the faculty advisers, based on professional goals, interests, needs, and expectations for their internship experiences. Over the course of the Fall and Spring semesters, students are expected to work a total of 250 hours minimum with their internship site. Internship sites have expanded beyond the Providence-Boston area to New York, Washington DC, Chicago, New Orleans, and Los Angeles, among other cities. Clearly, the internships have become very popular in the policy community and the feedback from our sponsoring organizations has been highly favorable. By the third cohort, external requests for UEP student interns had exceeded the class size. Currently, the demand exceeds supply by a ratio of 3 to 1. The program provides funding for student travel in conjunction with their Internship.

UEP has continued to increase the size of its applicant pool, attract a growing number of strong applicants, reduce its rate of admissions, stabilize its yield, and maintain a strong representation of students of color. With a strong effort to market the new program, the applicant pool increased from 27 to 75 between the first and the second program year (or an increase of 2.8 times). Since its second year, the applicant pool has remained relatively stable. Students of color and women are very well represented in the UEP. For example, the current cohort (Class of 2015) has 40% students of color and 79% female. Equally important, of the 9 current faculty members who teach the core courses, 3 are minority male (1 African American, 1 Latino, and 1 Asian American) and 2 are women.

The UEP program also shows strong measurable outcomes. First, 100% of the matriculated students have successfully completed the program and earned their master’s degree. Second, job placement for the UEP graduates is exceptionally strong even during a period of tight labor market. Third, the UEP has created a healthy revenue stream for the University and the Graduate School. Designed as a 50-50 revenue sharing arrangement, the UEP keeps 50% of the total tuition revenue for its program use. Most of these funds are used for merit-based financial assistance to the students. The remaining 50% of the total tuition revenue is allocated to the University and the Graduate School.

Finally, UEP has made important policy impact at the local, state, and national level. During the early program years, the UEP rapidly gained national visibility by hosting regional and national conferences on prominent reform issues, such as union-management relations and data-informed policy making in urban districts. In Rhode Island, UEP graduate interns were actively involved in the development, planning, and writing of the state’s Race to the Top...
application, where the state won $75 million in the second round of competition. Further, faculty and graduate students provided research support in redesigning the school funding formula for Rhode Island, which was signed into law by the Governor on June 23, 2010. In 2013, the Mayor’s office was awarded a major grant from the Bloomberg Philanthropies to launch an innovative program, “Providence Talks.” This initiative supports new mothers in low-income and diverse neighborhoods to use reading materials in their communication with their infants and young children. UEP students, especially those with fluent Spanish skill, have served as project assistants. Using a randomized research design, UEP faculty and students are core members of the third-party evaluation team on this mayoral initiative. UEP interns also play a central role in a large-scale study of teacher evaluation in Tennessee led by two UEP faculty members. In short, UEP’s track record will ensure its ongoing contribution both on campus and in the field of urban education policy.
Preface

Participation of Professors Emeriti/Emerita in University and departmental affairs can be beneficial to a variety of the University's programs of education, research, mentoring and community relations. To be most productive, it is imperative that Emeriti (and soon-to-be Emeriti) have a clear sense of their position in, and relation to the larger University. This document outlines current Brown policy on the rights and privileges of emeriti, identifies certain of its inconsistencies, and closes by providing recommendations for creating an environment in which the entire University can enhance its scholarly mission.

The report is in two parts. The first summarizes existing rights and privileges, along with an appendix that lists an ever increasing number of exclusions and restrictions that concern many faculty. The second is a set of recommendations for making the Brown community a more welcoming place for senior faculty embarking on the next stage of their professional career, and is not so much an advocacy for retired faculty as it is a framework in which the entire University can benefit from a more robust involvement of its emeriti.

Outline of the CFR Report

Part 1. Synthesis of Current Rights & Privileges of Emeriti Faculty

Appendix to Synthesis of the Rights & Privileges of Emeriti Faculty

1) Importance of Pre-Planning for Retirement.
2) Role of Departments in Retirement.
3) Specific Restrictions on the Rights and Privileges of Emeriti.


Introduction. The Committee on Faculty Retirement (CFR) concurs with the FEC Report of the Joint Committee on Employee Benefits (Roth, 2013) which asserts that

In order to foster the creation of an intellectual community in which retired faculty have a valued place, we recommend that the University establish clearly worded Rights and Privileges of Emeritus Faculty.

Recommendations.

Appendix 1: Reconsidering Specific Restrictions on the Rights and Privileges of Emeriti

Appendix 2: Reiterating the Full List of Recommended Faculty Retirement Benefits of the 2013 Roth Report.


Synthesis of Current Rights & Privileges of Emeriti Faculty
Version: 23 April 2015

Compiled by Jack (John F) Hermance
Professor and Member of the CFR

Participation of Professors Emeriti in University and departmental affairs can be beneficial to a variety of the University's programs of education, research, and community relations. To be most productive, it is imperative that Emeriti (and soon-to-be Emeriti) have a sense of their position in, and resources they might expect, from the larger University. This document outlines current University policy and tradition directed toward enhancing this collaboration.

Appointment as Professor Emeritus/Emerita

Tenured faculty and other faculty holding the rank of Professor are recommended to the Corporation for appointment as Professor Emeritus or Professor Emerita following retirement. They remain members of the faculty of Brown University with all the privileges of that rank except they are no longer tenured, if they previously were. The University policy for determining who shall be entitled to it is as follows:

1. Tenured faculty and faculty at the rank of Full Professor shall be recommended to the Corporation for the emerita/emeritus title upon retirement.

2. Other faculty may be recommended for such a title, provided that they have served a minimum of 15 years of service as faculty at Brown University (or equivalent for medical faculty in the community), and are retiring from the faculty.

3. Administrators who have exempt classifications, have served a minimum of 15 years at Brown University as administrators and/ or faculty, may be recommended for the emerita/emeritus title to the Corporation, upon their retirement from Brown University.

The remainder of this document deals only with emeritus faculty; it does not refer to emeritus administrators without faculty rank or to retiring persons who do not qualify for the emeritus rank (henceforth the term emeritus in this document shall be considered to include emerita.

Rights and Privileges of Emeriti

The specific privileges retained by an emeritus professor will be described in the remainder of this document. The appointment as Professor Emeritus/Emerita is considered an “active” appointment and as such the retired faculty member has the following privileges:

I.D. Card: A faculty member’s identity card is the passport to campus buildings, to use of the libraries, to athletic facilities, and to University functions. Emeritus faculty members may retain their I.D. cards and continue to use them as they did before retirement. If necessary, a retired faculty member may procure a new card.
Faculty Meetings: The emeritus professor has the same status as other non-voting members of the faculty; that is, attendance at faculty meetings and participation in discussions are permitted but voting is not allowed unless an emeritus professor his currently appointed as an adjunct, is serving on a Faculty committee, or who was a voting member of the Faculty during the 1973-74 academic year.

Libraries: Emeritus faculty have the same library privileges as active members of the faculty, including the withdrawal of books under faculty rules, and access to electronic resources from any location. Those working extensively in a library may apply for a carrel or study room; these will be assigned on the same priority basis as to active faculty.

Office Space: An emeritus professor actively engaged in research or teaching which necessitates frequent presence on the campus is entitled to appropriate office space. Since the assignment of office space is done by individual departments and divisions, a retiring faculty member should consult with the chairman and make known his or her needs and wishes in advance of retirement. Efforts should be made to have the assigned office space in or close to the department of the emeritus faculty person.

Mail: The emeritus professor will continue to have a Brown e-mail account and access to conventional mail. An emeritus professor may keep a mailbox in the department and will be retained on the University and departmental mailing lists, so that all material mailed to faculty or department members, including publications such as the Brown Alumni Monthly will be received. Campus Mail may be used, and the University Mail Service may be used for outside mail under the same restrictions as apply to other faculty.

Faculty Club: Membership in the Faculty Club without payment of dues is available to emeritus faculty. The Club also has a small lounge available for their exclusive use:

Moving Expenses: Expenses that faculty incur in vacating their offices may be reimbursed for up to a total of $1,000. The University has a contract with Conlon Moving & Storage; Brown employees may be eligible for discounted rates. Information is available from Margot Saurette (margot_saurette @brown.edu; 863-2216 or her successor).

Athletic Facilities and Tickets: Emeritus faculty are entitled to use athletic facilities such as the swimming pool, tennis and squash courts, and running track under the same conditions as active faculty. Retired faculty may use Brown’s recreational facilities at no charge. Applications should be addressed to
https://payment.brown.edu/C20460_ustores/web/product_detail.jsp?PRODUCTID=1223&SINGLESTORE=true

They may purchase tickets to sports events at the faculty rate, if any.

Grants and Contracts: An emeritus professor may submit proposals for research grants through the University, and will be assisted by the Office of Sponsored Projects (OSP) (originally the Office of Research Administration) in so doing. He or she may act as principal investigator, consultant, or in any other capacity under such grants. If, however, a stipend is received, the emeritus faculty member must be appointed Adjunct Professor for
the duration of the stipend by the chairman of the relevant department or appropriate
authorizing office.

**Support for Research:** Emeritus faculty who have exhausted all other sources of funding
are encouraged to apply to the Emeriti Faculty Research Fund. The amounts awarded may
be up to $1,000 annually for a maximum of three years. Guidelines and an application form
may be obtained from the Dean of the Faculty. Note that faculty who retired under the Last
Optional Retirement Incentive Plan are eligible to apply for up to $2,000 in research
support for the three years following retirement.

**Computer Services:** The emeritus professor has full access to the CIS Help Desk for
assistance with computing needs, and may download software subject to the terms of
Brown licensing agreements.

**Computer Account:** A retiring faculty member who already has a computer account may
continue to use it after retirement. An emeritus professor may apply for such an account on
the same basis as active faculty.

**Ombuds Office:** Emeriti have full access to the Office of the University Ombudsperson.

**Free Parking:** An emeritus professor may apply for a courtesy card which permits parking
in any unreserved lots maintained by the University. There is no charge for this, although a
tag from the Parking Office is required, and needs to be renewed annually.

**Assigned Parking:** Retired faculty who are assigned a parking space in a University lot
may keep it on a space-available basis. If there is no paycheck issued by Brown, payment
arrangements must be made directly with the Parking Office.

**Major Medical Insurance:** The University maintains Major Medical Insurance under the
Blue Cross program for an emeritus faculty member without charge, provided that he or
she is at least 62 years old and has had at least 9 years and 9 months active service. This
does not extend to Medicare medical insurance or Blue Cross Plan 65 which must be paid
by the emeritus professor. However, faculty members retiring before the age of 65 may
continue in the University Blue Cross- Blue Shield group at the group rate until they reach
65. Medical Insurance: Eligible retirees may elect to join group health and/or dental
insurance plans sponsored by the University. These are fully retiree-paid. See:

http://brown.edu/about/administration/human-resources/benefits/health-
insurance/retiree-health-and-dental-insurance

**Appendix¹ to Synthesis of the Rights & Privileges of Emeriti Faculty**

1) Importance of Pre-Planning for Retirement.

It is recommended that faculty considering retirement discuss these plans with their
departments and appropriate administrative officers in the Provost’s Office, and others.
Policies and privileges vary widely among departments, so potential retirees should review
the following section entitled: “Role of Departments in Retirement” and familiarize

¹ Version: 2015/04/23

Faculty Bulletin 10  May 2015
themselves with the section entitled: “Specific Restrictions on the Rights and Privileges of Emeriti.”

Tenured faculty who wish to reduce their effort and “phase out” of full-time work in the period leading up to retirement may choose a special phased retirement arrangement:

http://www.brown.edu/Administration/Provost/policies/srp2.html

Questions about the terms of these plans or the eligibility criteria, should be addressed to Elizabeth Doherty (elizabeth_doherty@brown.edu; 863-7845) or her successor.

2) Role of Departments in Retirement

Certain privileges for emeritus faculty as well as certain activities in which they may wish to participate are at the discretion and under the control of individual departments and divisions. There is at present no standard or consistent body of policy governing these matters; each department makes its own rules. In general it may be said that most departments have not seriously considered or formally adopted policies concerning the ongoing participation of emeritus faculty in the affairs of the department. Instead, various decisions are made only when a member of the department becomes emeritus. In the case of some departments which have had emeritus members over the years, policy has been set by custom, depending as much upon discussions with the chair at the time of the retirement and the status and desires of the retiring professor as upon conscious departmental discussion and decision. For this reason, the position of emeritus faculty varies considerably across departments.

Please see Chapter 14 of the Handbook of Academic Administration for details, including guidelines for participation in departmental affairs following retirement:

http://www.brown.edu/about/administration/dean-of-faculty/policies

Because of the informal and unformulated situation described above, retiring faculty who wish to maintain a connection with their departments and participate in some of their activities are urged to consult with the department chairman in advance and reach agreement about the nature and degree of their participation. Because of the normal turnover of chairmen it is recommended that certain matters agreed upon be spelled out in writing.

The following are important areas of departmental discretion with regard to emeritus faculty.

Office space for emeriti faculty needing such has been addressed earlier in this document. Similar considerations apply to access to laboratory space and facilities in those departments which maintain laboratories but laboratory space is not fungible. The emeritus professor’s needs and wishes in this regard must be considered in the light of the ongoing research program of the department, the nature of the emeritus professor’s research, and the availability of laboratory resources.

Advising Students: Some departments welcome the assistance of emeritus faculty in advising students, especially in fields of their specialties. This may extend to serving on doctoral committees, to supervising masters’ or to senior honors theses.
Teaching: The most common participation of emeritus faculty in the teaching program is giving occasional guest lectures on invitation in colleagues’ courses. This may extend to taking over a course for a brief period when the regular instructor must be absent. Emeritus professors also may give informal reading courses to individual students or small groups, with or without credit. Because of the constraint against paying emeriti, this type of teaching activity is generally voluntary and unpaid.

When retired professors are enlisted to give a regular departmental course, they are normally appointed Adjunct Professor and paid accordingly. There shall be no waiting period after retirement before being able to be so hired by the university. Normally the appointment as adjunct is done with the approval of the department chair and the appropriate dean. In some cases though, the subject to be taught will not fit into an established department’s plan, and would require the approval of an alternative authorizing office.

Departmental Governance: Departments vary in the degree to which they enlist participation of emeritus faculty in the ongoing business of the department: attendance at staff meetings, service on departmental committees, etc. Emeriti faculty willing to take part in ongoing business, should so signify.

Other Departmental Activities: Departments may regularly invite their emeriti to colloquia and other professional gatherings and to social events sponsored by the department. Emeriti may be asked to help with recruiting and screening candidates for positions in the department, and do so at their discretion.

3) Specific Restrictions on the Rights and Privileges of Emeriti

An emeritus professor remains a member of the faculty of Brown University with all the privileges appertaining to that rank except the following:

1. One may not receive pay from the University without an appropriate reappointment. If an emeritus professor is to perform services for the University, which entitle one to a salary, he or she will be appointed to the rank of Adjunct Professor for the duration of the period during which services will be performed.

2. One may not participate in faculty votes, unless serving on a faculty committee or upon being reappointed as adjunct professor, whereupon voting rights will be extended for the period of the appointment.

3. Notices from Faculty Governance regarding faculty meetings and other business are sent only to voting members of the faculty -- and so retired colleagues are included only if they meet certain criteria (e.g. service on a faculty committee).

4. It has been customary for the Committee on Nominations not to nominate emeritus faculty for positions on major standing committees, although emeriti are welcome to serve on other committees.

5. Participation in departmental faculty meetings, as a non-voting member, is at the discretion of the department chair, with the exception of faculty who were voting members during the 1973-74 academic year, who shall always retain the right to vote.
6. An emeritus faculty member cannot serve as the sole primary advisor on a Ph.D. dissertation.

7. An emeritus faculty member cannot be a reader of a dissertation if another emeritus faculty member is on the thesis committee.

8. The CCC has determined that retired faculty should not teach courses or serve in teaching roles that include mentoring relationships extending beyond an individual semester. Thus first year seminars, academic advising, and independent concentrations are not open to retired faculty.

9. Emeriti are excluded from applying for certain University grants.

10. Most (if not all) grants-in-aid to emeriti from the University for research and related travel are restricted to the first three years following the date of retirement.

Part 2. Recommendations

Toward a Robust Code of Rights and Privileges for Emeritus Faculty:
Recommendations of the CPR (2015)²

Introduction. The Committee on Faculty Retirement (CFR) concurs with the FEC Report of the Joint Committee on Employee Benefits³ (Roth, 2013) which asserts that

In order to foster the creation of an intellectual community in which retired faculty have a valued place, we recommend that the University establish clearly worded Rights and Privileges of Emeritus Faculty.

Among the core convictions of the University Community⁴ should be a recognition of the exceptional contributions that emeriti faculty continue to make to the ongoing mission of the University in the areas of scholarly research, instruction, student mentoring and community outreach. A corollary is that a properly formulated statement of the rights and privileges of emeriti would provide an essential foundation to enable retirees to fulfill the aspirations they bring to what many see as the next stage of their professional careers. Transitioning from regular faculty to emeritus becomes the logical next step in fulfilling one’s professional career. A Robust Code of Rights and Privileges for Emeritus Faculty provides the framework for emeriti to achieve their objectives.

In collating the elements of this Code, the CFR has drawn on a variety of faculty and administration documents, along with individual discussions; in particular we draw upon the Roth (2013) FEC Report of the Joint Committee on Employee Benefits.

² Amended version: 2015/04/29.
³ The full list of recommendations of the Roth Report is attached (although reordered); with an amended list of the Roth Report’s Rights & Privileges. While the latter are modified, they have been reviewed by Prof. Roth and generally accord with the intent of his committee.
⁴ The term “University Community” as used in this document refers to Administrators, Trustees, the Standing or Regular Faculty, Emeriti, Alumni and Undergraduate and Graduate Students.
Background on the Brown Policy toward Emeriti. An inventory of rights and privileges extended to emeriti at the more visionary institutions in the U.S., Great Britain and its Commonwealth underscores the benefits jointly shared by emeriti and the larger university community when campus policies are designed to encourage the continuing academic and intellectual engagement of emeritus faculty. Brown University has a mixed legacy in this regard (see Roth, 2013; Brown Daily Herald, 2014). There have been times of exemplary vision. For example, the 1983 Brochure for Retired and Retiring Faculty produced by the Provost and the Dean of the Faculty (hereafter referred to as the “Provost’s Report, 1983”) indicates that University administrators of the day readily acknowledged the profound contribution that Emeriti made to the ongoing mission of the campus. It was recognized that an emeritus professor may submit proposals for research grants through the University, and be assisted by the Office of Research Administration in so doing. An emeritus could act as principal investigator, consultant, or in any other capacity under such grants. The Provost’s Report (1983) noted that there are no restrictions against emeritus faculty serving on standing or ad hoc committees and subcommittees of the faculty, whether appointed or elected, and that participation of emeriti in University and departmental affairs can be beneficial not only to themselves but to various aspects of the University’s program of education, research, and community relations. There was a sense of welcoming the assistance of emeritus faculty in counselling students, serving on doctoral committees and supervising masters’ or senior honours theses. The Provost’s Report, (1983) acknowledged that certain emeriti provided informal reading courses to individual students or small groups, with or without credit. The policy asserts that an emeritus professor remains a member of the faculty of Brown University with all the privileges appertaining to that rank except two: 1. One may not receive pay from the University (unless reappointed to an appropriate position). 2. One may not participate in faculty votes.

In contrast to the two, benign restrictions in 1983, in 2015 we have identified at least nine (9) explicit restrictions or exclusions levied by a variety of administrative offices in what appears to be an uncoordinated manner\(^5\). Therefore, we – the 2015 CFR, in accordance with the conclusions of the 2013 Roth Report – assert that the Rights and Privileges of Emeritus Faculty be formulated in such a way so as to foster the intellectual community in which retired faculty have a valued place, and to fulfill what we perceive to be the overarching intent of the University Community\(^6\) that Emeriti should be granted, wherever possible, the same status as Standing or Regular Faculty members, or, in some cases, singular accommodation for their past contributions serving the Brown community--

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\(^5\) These nine restrictions are listed elsewhere in this documentation; see the Appendix.

\(^6\) The University Community as used in this document refers to Administrators, Trustees, the Standing or Regular Faculty, and Undergraduate and Graduate Students.
Concerns and Recommendations

The “Gatekeepers”: Facilitating the University/Emeritus Connection

Who should be the gatekeepers of Emeriti rights and privileges? Historically at Brown, it has evolved that a myriad of offices have had a role in delegating privileges to emeriti. Among these, department chairs have been primary players. However, it is unclear to the CFR why most, if not all decisions regarding the teaching and research activities of emeriti professors are under the jurisdiction and "privilege granted" only of the individual's past chairperson. While we would concur with the traditional view that "departments should have a large degree of autonomy in determining their academic missions," we also recognize that historically many emeriti have served and continue to serve a larger community by contributing directly to the University's mission, which might be quite different from the mission of one's department of origin. We see emeriti as University citizens, as much as – perhaps more than – Department citizens. Emeriti contribute to the areas of teaching, interdisciplinary research, faculty governance, student mentoring, and generally interact with a much broader community than one's original department.

Recommendation: We recommend that an administrative officer be made responsible for supporting and coordinating with emeriti faculty whose work does not fit into the mission of any department. It would be expected that this administrative officer would have her/his own network of university contacts to whom emeriti may be directed.

Instruction

Recommendation: Emeriti should be encouraged to develop and offer non-credit and for-credit courses at all levels in the University. Not to do so removes superbly-qualified emeriti from passing on their knowledge to both undergraduate and graduate students, and in some cases their peers.

Recommendation: Emeriti should be eligible for University course development funds.

Recommendation: Emeriti should not be excluded from applying to offer University courses (such as Freshman seminars, etc.) along with regular faculty.

Recommendation: If an occasion should arise that a particular administrative office feels the exclusion of emeriti is in the best interest of the University Community, it should make its reasons very clear in any announcements.

Recommendation: Any policy that implicitly or explicitly restricts emeriti’s mentoring relationships with students – undergraduate and graduate – should be immediately terminated. This would apply to the existing policy precluding emeriti from mentoring relations with students extending beyond an individual semester.

University and External Research Grants

Concern: There is no defensible argument for excluding retirees from the usual avenues of grant funding from outside sources or within the university. Some of the following is redundant with recommendations elsewhere, but is included here for completeness.
Recommendation: An emeritus professor may submit proposals for research grants through the University, and will be assisted by the Office of Sponsored Projects (OSP) (originally the Office of Research Administration) in so doing. He or she may act as principal investigator, consultant, or in any other capacity under such grants.

Recommendation: There should be a procedure for submitting research proposals, or other scholarly initiatives, including instruction, through other than one’s prior department.

Recommendation: Emeriti should be eligible for University research and travel funds along with Regular Faculty. Note that the current three-year limit following retirement does not account for the professional longevity of many of our emeriti, and should accordingly be ended.

Service on Faculty Committees

Recommendation: There should be no restrictions on emeritus faculty serving on standing or ad hoc committees and subcommittees of the faculty whether elected or appointed. Any policy – in spirit or practice – restricting emeriti from serving on “major” committees, should be immediately terminated.

Service as Research Advisors

Concern: Particularly distressing is the currently unenforced or episodically enforced policy:

"An emeritus faculty member cannot serve as the sole primary advisor on a dissertation."

This exclusion is significantly out-of-touch with current arrangements on campus in that a number of emeriti are in fact principal research advisors, and certainly out-of-touch with the notion of nurturing the active participation of emeriti in university affairs.

Recommendation: Emeriti may continue to serve on Master’s and Ph.D. Committees, as well as to be the principal Thesis Advisor of a graduate student, in good standing, working on his or her Master’s or Ph.D. degree.

Emeriti Voting Privileges

Concern: The University currently has two versions of grandfathered voting rights:

1) Those who were voting members of the faculty during the academic year 1973-74 academic year retain that membership on promotion to Emeritus/emerita status.

2) Participation in departmental faculty meetings, as a non-voting member, is at the discretion of the department chair, with the exception of faculty who were voting members during the 1973-74 academic year, who shall always retain the right to vote.

The existence of a “special class” of voter among the Brown Community is an aberration that is unappealing even to most of those falling within the group. Moreover, granting all emeriti the right to vote on faculty matters has the advantage of more engagement at our regular faculty meetings. We propose the following.
**Recommendation:** Emeriti will continue to have the right to vote on faculty-wide matters at meetings, electronically or by mail ballot. The right to vote on department matters will be at the discretion of the respective department.

**Relations with Departments-of-Origin**

**Recommendation:** Considering the broad variability in the way different departments at Brown interact with emeritus faculty, we recommend that all departments, centers and institutes at Brown develop written guidelines describing their policies, and make them readily accessible to all faculty.

**Recommendation:** Emeritus faculty are entitled to office space and administrative support in their former department, particularly if the emeritus is actively serving the department’s mission, such as teaching, research or otherwise.

**Recommendation:** Emeritus faculty remain members of their former department and are entitled to participate in departmental affairs, including participation in departmental faculty meetings, as non-voting member.

**Position Title(s)**

**Recommendation:** Professors Emeriti should have the option of being addressed as ‘Professor Emeritus’ (or ‘Emerita’) or simply as ‘Professor’.

**Concern:** Recognizing that apparently for administrative purposes, a retired faculty member serving-for-pay (such as teaching or extra-mural research support) requires other than a ‘Professor Emeritus’ title, we suggest that the current ‘Adjunct Professor’ title is generally inappropriate for emeriti retired at the rank of Full and Associate Professor. It is a demotion among one’s peers, particularly new acquaintances at a time in one’s career that bridge-building may be important, and in some cases it may even jeopardize extramural funding.

**Recommendation:** If a named reappointment of a professor emeritus/emerita is absolutely necessary for administrative purposes, a more suitable title should be devised, such as ‘Professor (RS)’ or ‘Associate Professor (RS)’, respectfully, where ‘RS’ denotes ‘Returned to Service’. We do not see why reappointments would require announcing ‘Adjunct’ or other designator to a larger community than University accountants.

**General Rights, Privileges and Benefits**

**Recommendation:** It is in the University’s interest to explore how emeritus faculty might better participate in Commencement, Opening Convocation and other University (& Departmental?) events, alumni functions, fund raising, and in some cases, undergraduate and graduate student recruitment. Careful planning could derive many benefits from an established celebration of Emeriti contributions to Brown. The Brown Alumni Monthly (BAM) is an excellent locus of celebratory influence. Occasions during Commencement provide another venue. At present it seems that it is individual classes and individual alumni who spark invitations to their emeriti professors; the ‘University’ does not seem to participate in this.
Recommendation: Library policies – such as those regarding the Science Library journals and books going into high density storage (outside Providence) – should be vetted among emeriti/emerita as well the regular faculty.

Recommendation: Emeriti faculty may continue to use the Brown letterhead.

Recommendation: Emeriti faculty may continue to use long distance telephone communications for professional business.

Recommendation: Emeriti faculty may continue to use University facilities for Research related shipping and receiving of materials and supplies.

Recommendation: Emeriti faculty may continue to have access to library carrels and faculty study rooms if available.

Recommendation: Emeriti faculty should be provided space to store working documents and materials (this is presently quite limited in the Emeriti Lounge).

Recommendation: If in fact there is a policy of free parking in unassigned parking areas for emeriti – particularly those serving on University business – the Parking Office needs to make this a practical reality.

Special Situations

The following two policies should continue to be published under the Rights and Privileges until no longer relevant to the affected Faculty.

Recommendation: Those who were voting members of the faculty during the academic year 1973-74 academic year retain that membership on promotion to Emeritus/emerita status. Policy needs to be clear on newer faculty members.

Recommendation: Those Faculty who elected to retain Brown's full tuition benefit plan retain that benefit upon retiring.

Procedures for Implementing these Rights and Privileges

Recommendation: The final list of emeriti benefits, rights and privileges should be in the Faculty Rules such that they would be accessible and transparent to the faculty from one generation of administrators to the next. Transparency in these matters is of high importance to current and potential retirees.

Recommendation: Policies toward engaging Emeriti as active participants in the University Community should invariably tend to be inclusive, not exclusive. We therefore request that existing exclusions or restrictions identified here, or yet to be identified in the future, be carefully assessed by the Administration and the Faculty as to their appropriateness. CFR serves as the watchdog on such matters.

Recommendation: Any substantive modification of these arrangements should be communicated directly to the Faculty, in particular the CFR, and placed on the agenda of a regular Faculty meeting for discussion.

Recommendation: The Human Resources Office should continue to offer seminars for faculty about to retire. The Human Resources Office should, with due respect for privacy,
proactively work with faculty about to retire to discuss benefits and related matters. This might include sending individual notices to each person who identify themselves as about to retire, inviting them to visit and confer.

**Future Directions**

While we doubt, in this cycle of budget deficit at Brown University, that there will be significant inroads into improving capital-intensive benefits to retirees (such as major medical coverage, a new Yale-type emeriti center, etc.; see Roth, 2013), we would suggest that the Administration keep these objectives in mind if it plans to stay competitive with its peer institutions. The Roth (2013) report summarizes the University’s standing in this regard quite well, and specific retiree benefits that the latter report identifies are included with the current CFR document on Proposed Rights and Privileges. With the Roth (2013) report as a starting point we suggest that the University Administration periodically review the Health Care, Supplements to Medicare, Dental, and Major Medical benefits that it might provide retirees. Failure to do so will place the future of Brown in a very non-competitive position for retaining its most productive, mid-career faculty. The University should regularly re-examine ways of making the benefits for retired faculty consistent with those offered by Brown’s peer institutions. We accordingly request that the University Administration (in coordination with the FEC and the agenda of regular Faulty meetings) periodically update the Faculty, during its regular meetings, on the status of its addressing the recommendations of the 2013 Roth Report.

*End of Recommendations*

**Citations:**


**Appendix 1: Reconsidering Specific Restrictions on the Rights and Privileges of Emeriti**

**Recommendation**: Policies toward engaging Emeriti as active participants in the University Community should invariably tend to be inclusive, not exclusive. We therefore request that existing exclusions or restrictions identified here, or yet to be identified in the future, be carefully assessed by the Administration and the Faculty as to their appropriateness.

Here, we address each restriction that has been brought to our attention.

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7 This recommendation, and all others in this Appendix have been summarized in the main body of recommendation of this report. They are presented here as background on the context of their origin.
Existing Policy (with CFR comments & recommendations)

An emeritus professor remains a member of the faculty of Brown University with all the privileges appertaining to that rank except the following:

1. One may not receive pay from the University without an appropriate reappointment. If an emeritus professor is to perform services for the University, which entitle one to a salary, he or she will be appointed to the rank of Adjunct Professor for the duration of the period during which services will be performed.

   **Comment:** The title “Adjunct” is taken by some as a demotion in rank, and is an inappropriate recognition of a faculty member who has served the community many years as a Full Professor.

2. One may not participate in faculty votes, unless serving on a faculty committee or upon being reappointed as adjunct professor, whereupon voting rights will be extended for the period of the appointment.

   **Comment:** The faculty may wish to revisit whether they should extend the right to vote to all emeriti.

3. Notices from Faculty Governance regarding faculty meetings and other business are sent only to voting members of the faculty -- and so retired colleagues are included only if they meet certain criteria (e.g. service on a faculty committee).

   **Comment:** The consequence of this policy is that many if not most emeriti are implicitly dropped from the University roles, hence isolated from campus activities.

4. It has been customary for the Committee on Nominations not to nominate emeritus faculty for positions on major standing committees, although emeriti are welcome to serve on other committees.

   **Comment:** It is hard for an emeritus to interpret this other than uncollegial, disrespectful, if not discriminatory. **Recommendation:** Drop this policy.

5. Participation in departmental faculty meetings, as a non-voting member, is at the discretion of the department chair, with the exception of faculty who were voting members during the 1973-74 academic year, who shall always retain the right to vote.

   **Recommended change:** Emeritus faculty remain members of their former department and are entitled to participate in departmental affairs, including participation in departmental faculty meetings, as non-voting member.

6. An emeritus faculty member cannot serve as the sole primary advisor on a Ph.D. dissertation.

   **Recommended change:** At the discretion of the department chair or appropriate authorizing office, emeritus faculty may continue to serve as advisors on Ph.D. dissertations.

7. An emeritus faculty member cannot be a reader of a dissertation if another emeritus faculty member is on the thesis committee.
Comment: It is hard for an emeritus to interpret this other than uncollegial, disrespectful, if not discriminatory. Recommendation: Drop this policy.

8. The CCC has determined that retired faculty should not teach courses or serve in teaching roles that include mentoring relationships extending beyond an individual semester. Thus first year seminars, academic advising, and independent concentrations are not open to retired faculty.

Comment: It is hard for an emeritus to interpret this other than uncollegial, disrespectful, if not discriminatory. Recommendation: Drop this policy, or have the appropriate administrator explain its basis in each instance of its implementation.

9. Emeriti are excluded from applying for certain University grants.

Comment: It is hard for an emeritus to interpret this other than uncollegial, disrespectful, if not discriminatory. Recommendation: Drop this policy, or have the appropriate administrator explain its basis in each instance of its implementation.

10. Most (if not all) grants-in-aid to emeriti from the University for research and related travel are restricted to the first three years following the date of retirement.

Comment: This three year limit does not account for the longevity of productivity by post-millennial emeriti. Recommendation: Administrators should consider dropping the time limit.

Appendix 2: Reiterating the Full List of Recommended Faculty Retirement Benefits of the 2013 Roth Report

1. In order to foster the creation of an intellectual community in which retired faculty have a valued place, we recommend that the University establish clearly worded Rights and Privileges of Emeritus Faculty (See Appendix E of the 2013 Roth Report).

2. That the University continue the current incentive for retired faculty of a three-year continuing connection to the university, turning it from an “incentive” into a “benefit.”

3. That the period of phased retirement be expanded from 3 to 5 years once a faculty member has agreed to a specific timetable for retirement.

4. That the current Phased Retirement Option be revised to offer full health benefits to faculty working less than 2/3 time.

5. That the University take steps to create a Center for Emeritus Faculty based on the model of the Koerner Center at Yale. We further suggest that this proposed Center be included as a funding goal in the new Strategic Campaign.

6. That the University establish a 501(c) (9) Health Retirement Savings Account to assist employees in saving for the high costs of healthcare in retirement. These kinds of accounts

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8 These are as originally declared, although reordered for the purpose of the 2015 CFR report.
have been adopted at some peer institutions (Washington University and NYU; the former is particularly clear: http://hr.wustl.edu/benefits/Pages/RMSA.aspx). They have the advantage of being tax-exempt if used for health care costs and allow savings for healthcare above amounts available in 403(b) accounts, which have an upper limit on yearly contributions. We recommend that the University provide a maximum contribution of $25,000 to all active employees 55 and over, beginning at age 55, with the yearly contributed amount pro-rated over 10 years. This, in essence, turns the current incentive of a $25,000 one-time salary addition for Healthcare costs in retirement into a benefit whose value would increase over time rather than be decreased by adding it to salary. The employee would be required to contribute some minimum amount in order to obtain the University contribution. For active employees currently over age 55, the University’s yearly contribution should be adjusted to reflect likely length of future service. This was one of the recommendations of the Butterfield Report of 2009.

7. We recommend that the University develop and maintain a website containing detailed, updated information on retirement options.

8. That the administration report to the Faculty within six months on the costs and possible subsidy of healthcare premiums for future retirees. This is necessary not only because it will foster the recruitment and retention of faculty, but also it may remove a major obstacle to retirement.

Appendix 3. An Alternative View of the Rights and Privileges of Emeritus Faculty

(Adapted by the 2014-15 CFR from Appendix E of the 2013 FEC Roth Report)

The University views retirement from the Standing Faculty as one stage of an academic career. The University encourages retired faculty members to remain involved with the University, their schools and their departments. Though no faculty member acquires new rights or privileges upon retirement, certain of those rights and privileges to which he or she was entitled prior to retirement are still extended.

1. Emeritus faculty may choose to retain the title of Professor or to adopt the title of Professor Emeritus/Emerita.

2. Emeritus faculty remain members of their former department and are entitled to participate in departmental affairs, including participation in departmental faculty meetings, as non-voting member.

3. Emeritus faculty are entitled to office space and administrative support in their former department to the extent that it is available and not required by the department for active faculty members or other departmental functions.

4. Emeritus faculty are entitled to office space and administrative support, to the extent available, in any facility that the university designates specifically for such faculty.

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9 Extracted and adapted by the CFR from the 2013: REPORT OF THE JOINT COMMITTEE ON EMPLOYEE BENEFITS, Chaired by Professor Harold Roth. Some of the original material was extracted by the FEC committee from the University of Pennsylvania’s Provost’s Memorandum (2008).
5. Emeritus faculty are entitled to be listed as such, at their discretion, on the department’s website.

6. Emeritus faculty retain their Brown ID card and the benefits it confers, including library privileges. For the purpose of access to university facilities such as the Faculty Club and athletic facilities, emeritus faculty retain the same rights as active faculty.

7. Emeritus faculty retain their Brown email address, user ID, and access to the university LAN (large area computer network). They are also entitled to use as their university mailing address the address of any facility that the university designates specifically for such faculty. At the discretion of the department chair, emeritus faculty may also retain their departmental mailing address.

8. Emeritus faculty are entitled to participate as members of their former department in university functions such as Convocation and Commencement.

9. Emeritus faculty are entitled to attend and participate in university-wide faculty meetings, as non-voting members.

10. Emeritus faculty are entitled to participation, as non-voting members, in departmental or university committees, at the discretion of the committee chair.

11. At the discretion of the department chair or appropriate authorizing office, emeritus faculty may continue to serve as advisors on PhD dissertations.

12. With the consent of the department chair or appropriate authorizing office, emeritus faculty may apply for university travel grants for the purpose of research, or for university or external research grants if the necessary space and support for such grant-funded projects is available.

13. Emeritus faculty may be hired by the university as adjunct professors to teach courses. There shall be no waiting period after retirement before being able to be so hired by the university.
It is not just Brown which is celebrating a round-number anniversary of 1764 – I have a public personal one, not as far back as Brown, but a number of decades ago and many miles away. In June 1944 there was D-Day, the Allied invasion of Nazi-occupied Normandy, and the Allied forces advanced to the point, early in September 1944, of being ready to invade Germany itself, with the old Carolingian city of Aachen the intended entry point of the US Army, the VII and XIIth Corps being ready with a sort of pincer plan from the west. That phase of WWII is described well by Charles Whiting [1], and I will not repeat that story at all.

Many histories do not mention that a week after D-Day the Germans began bombarding the Greater London Area with Vergeltungswaffe-1 bombing planes, V-1 for short. Vergeltungswaffe can be translated as “revenge weapon”. They were fast, jet-propelled robotic bombs, launched largely from the Pas de Calais area, then still in German hands. They flew low, maybe 3-4,000 feet, faster at 350 m.p.h. than defensive fighter airplanes there, and were sent at all times of day and night, a new tactic as Nazi bombing had previously been just at night. I lived in the target area. We soon learned to recognize the strong buzzing sound of their engines as they approached, and were personally relieved when they kept going, out of earshot: each time, that was another that would crash and explode somewhere else, hopefully without injuring anyone.

One day, while I was at kindergarten school in Chipstead Valley, a V-1 came and crashed in the woods across the road from my then home, and its explosion blew in all the windows of my home – my bedroom faced that wood. This made the house uninhabitable for a while, until some repairs could be made. My father worked for the Ministry of Aircraft Production, and needed to stay in the London area, but attacks with the V-1s continued, my school term was almost ended, so I was evacuated to the northern tip of Oxfordshire, to a market town called Banbury.

Arrangements for matching evacuees with host families had been improved as the War progressed, refugees in their own country, and I was taken in by a mother (husband away in the Services) whose daughter, very slightly older than me, had always wanted a brother, and I was an only child, very willing to experience a sister. Luckily we got on together very well. It was too late in the summer term to find a local school for me, and soon this ‘sister’ and I could spend 24 hours a day together in the summer, and did.

For the autumn term there was already an arrangement I’d start in an all-boys school, John Fisher, about 7 miles from my home, and my ‘sister’ would have loved to come with me, but her mother saw her job was to keep that girl intact for when her father came home, and it might have been a problem to find a matching school for her on short notice if she came with me. The frequency of V-1 bombing had dropped as their prime launch sites were overrun by the Allied armies, and my father took me to see in London an unexploded V-1
which had been cut open to display its guts. The engine was quite remarkable: it was a largely empty tube mounted well back on the small airplane, but with springy vanes at the front which buzzed open-and-shut about 50 times per second, fuel was sprayed in behind that with a spark plug for ignition, and the tube tapered tighter a bit towards the back to make the burned gases exit faster. Thousands had been launched in the summer, and with close to a ton of explosives each, they could cause plenty of deaths, injuries and damage. Then there were the V-2s, fewer in number, and one landed less than a mile from me, the V-2s being famous after the War because they were big rockets. Werner von Braun had been involved in developing them in Peenemuende, on an island on the Baltic Coast, and he was scooped up by the US after WWII ended so he could keep working on liquid-propellant rockets. The pioneer of those had been Robert Goddard, a professor at Clark University in Worcester MA. Before WWII Goddard had difficulty raising money for his experiments, and no one important enough in the US had foreseen the research would be so critical for military use and for NASA, which was yet to be conceived, and his research had been published. The Germans explained that had helped them.

It might have been a convenient Hollywood ending if my Banbury ‘sister’ and I had found each other again later. Real life very rarely provides that, it did not happen for us, but the flows inside the V-1 and V-2 engines entered into my life later, and so did the City of Aachen. After WW II ended, the famous Hungarian fluid-dynamicist T. von Karman visited Brown, where I met him, he had been at one time a professor at RWTH Aachen (it is also the city where he died), and an engaging international personality. One phenomenon named after him is the Karman Vortex Street.

On the day when President Kennedy was assassinated, I was at a meeting in Philadelphia. Some of my research was being supported by the USAF Branch at Wright-Patterson AFB, and we were investigating the effects of ambient turbulence and strong vibrations on rates of heat transfer. Practical operational incentives included that various USAF rocket engines had strong vibrations when running, and this often led to catastrophes. Altered heat transfer patterns were suspected, and preliminary experiments showed there seemed to be a critical level at which that effect happened. Some people believed a new physics principle of ‘thermo-acoustic transduction’ had been discovered. One of the program officers had been previously a student in Germany, and told me that an allied bomb had passed through his desk there, destroying his PhD thesis on the bomb’s further down in the building before it exploded. The meeting that November 22nd included teams the USAF supported in the same overall program, they funded a team in Georgia (working in a geometry that reminded me of the V-1s), and a professor at MIT, besides us, and shortly later the MIT professor died of a heart attack. Perhaps because I had already published a short paper re-analyzing data obtained with the equipment he had, Wright-Patterson decided Brown should have his equipment transferred to us here. Typically we like to propose what equipment we get, but this was a different situation. As it was, we had to dig a pit in the basement of Prince Lab to fit in the largest part, which was an anechoic chamber to allow intense sounds to be used safely. In my same short paper I’d pointed out no one had solved the fluid-mechanical equations yet with the heat convection cases in mind, and I realized I should take a shot at that too.
I’d never worked experimentally with high-intensity sound before but knew there were colleagues in the Physics Department who were experts in acoustics. While I was chatting one day with Peter Westervelt of Physics in his office about what I was trying to do, a sabbatical visitor (Bruce Brackenridge) in his office at the same time told me he had optical equipment back at his home base in Appleton, WI, which he could lend me as it would help, and he drove there to pick it up over Thanksgiving and bring it here, a remarkable kindness. Jon Peterka from Colorado was my grad student in this project. Over the 1965 Christmas-New Year Break I had a ‘eureka’ moment on how to solve the theoretical problem in a few days, and my main effort was to find tables of the Incomplete Beta Function. So I had shown experimentally and theoretically that local heat transfer varied continuously and smoothly with the sound or vibration intensity, and there was after all a way of making a theory – which also had a number of different extreme cases, which had led to earlier confusions in trying to plot all available experimental measurements on a single set of axes. (I suspect that all helped in getting me promoted to full professor after three years in Associate rank.)

Word spread that I’d solved the problem and I was invited to write a lead article for the prestigious Applied Mechanics Reviews which was published in 1967 [2], and 19 years later I was invited to write a rare update [3]. By then, Aachen had entered my academic life – it started in June 1975, I had gone to a meeting in Rungsted Kyst, famous as the retirement area of Karen Blixen, on the Danish east coast, I’d given 3 papers in two days and went to a local beach, where I discovered the local young ladies went topless and I decided not to tell others at the conference, as it might thin down the numbers attending the papers! One of the attendees at the meeting was a professor of physiology at a German medical School, Holger Schmid-Schoenbein, and he invited me to visit there on my ground-travels back from Copenhagen to London – I had an “open-jaw” air ticket which permitted that. This would be my first visit to Germany. I took a series of trains, and reached his place in Aachen, not yet fully repaired from damages in WWII. I liked him, his Department and the city, and agreed to take a sabbatical there if funding could be raised. The Alexander von Humboldt Stiftung (Foundation) had a “thank-you for the Marshall Plan” scheme then which was a fine fit and in 1976-1977 I had a leave in Aachen. The summer of 1976 was glorious there, yet there were limits to how far I could explore Germany as East Germany was still under Soviet dominance, and the EU was still a dream. Living close to the ‘three-country point’ (Belgium-W.Germany-Holland) I had to carry three currencies as well as my passport. Visiting years later, I saw how the borders have melted into each other as part of the EU.

Jon Peterka returned to Colorado State, not only as an academic but as a partner with Cermak and Petersen as CPP Inc., a privately-held consulting company in the wind-engineering field, such as design of very tall buildings, wind turbines and wind farms.

I have often taught a course about design of engines and turbines, and found that the V-1 engine is omitted from English-language books on that subject, despite the engine’s basic simplicity. Information is available in some museums, however. The Alexander von Humboldt Foundation has gone from strength to strength, counting a number of Nobel
Prize winners among its ‘alumni’ and still fosters research ties between Germany and the rest of the world, now in more than scientific subjects.

References
Bertrand Russell’s *History of Western Philosophy*

Peter Wegner  
Professor Emeritus of Computer Science

Bertrand Russell (the third Earl Russell) was a British philosopher, mathematician, and political activist who was born in 1872 and died in 1970 at age 98. He studied mathematics at Trinity College, Cambridge, passing the Mathematics Tripos in 1893 as a Senior Wrangler and becoming a Fellow in 1895. He published his book *Principles of Mathematics* in 1903, and a more substantive book on mathematics, *Principia Mathematica*, with Alfred North Whitehead in 1910-1913.

During World War I, Russell became a pacifist, writing articles that led to his conviction and imprisonment in 1917 under the Defence of the Realm Act for subverting British wartime military regulations; and he lost his Cambridge fellowship. In the inter-war years, he wrote books like *Why I am not a Christian* and *Marriage and Morals*. He was invited to lecture in America on several occasions, and held visiting posts at universities in California and at the University of Chicago. His anti-Christian views led the American Episcopal and Catholic communities to oppose, in 1940, his appointment as a professor at CCNY, to prevent his teaching from disrupting the religious beliefs of his students.

Russell was rescued from potential unemployment by Dr. Albert Barnes, who offered him a position at the Barnes Foundation in Philadelphia, where he taught a course on philosophy which culminated in his most famous work, *A History of Western Philosophy* (1948). The book sold well, restoring Russell’s financial independence as well as providing students with an excellent text for studying the history of Greek, Roman, Christian, and modern philosophy up to Einstein in the early 1900s.

Philosophy, though still an incompletely defined concept, was described by Russell as the discipline that underpins human ideas about religion, ethics and science. It has influenced the mental and political beliefs of thinkers in general, and in particular it formed a central basis of Russell’s writing and political activity.

Greek philosophical concerns originated in the 6th century BCE with the ideas of Thales, Heraclitus, Parmenides and Pythagoras, and developed further during the 5th and 4th centuries BC under the Athenian philosophers Socrates, Plato, and Aristotle, whose teaching and writing constituted a high-level presentation of the principles of philosophy.

Plato, a student of Socrates, was distressed by the latter’s trial and execution, which he blamed on the erroneous principles of Athenian democracy. Plato’s *Utopia*, which proposed that only philosophers should be political leaders, was anti-democratic and claimed that Sparta’s, practice of armed government was preferable to Athenian politics which had allowed Sparta to triumph over Athens during the Peloponnesian War and to control Athens for 25 years during Plato’s youth. However, Plato’s views were widely endorsed as
the basis of Western philosophy, first by the Romans and later by the Church, until after 1200 CE, when it was modified first by Aristotelian tenets and later on by modern scientific principles.

The Greek city-state was replaced as a form of government by Alexander the Great’s large territorial control, and then by the Roman Empire, which ignored philosophical points of view and adopted Christianity under Constantine around 330 CE. This enhanced Constantine’s control of the army because many of its soldiers were Christian, and extended the Roman Empire by nearly 100 years until 410 CE, when Rome was sacked by the Goths.

Around 300 BCE, the Greeks had introduced Epicureanism and Stoicism as new forms of philosophy, which focused on promoting pleasure and avoiding pain as a formula for the good life. The Romans accepted the Platonic model, and the Empire’s later philosophers Plotinus and Origen adapted Platonic philosophy to Christianity around 250 CE, which contributed to the expansion of Christianity as a growing Roman religion. Rome created the Vatican as a base for Christianity and the Pope became a religious leader who could define the principles of Christianity and resolve substantive differences among Gnostics, Manicheans, Pelagians, and other divergent Christian sects.

The early (Roman) period of Christianity included dignitaries like Ambrose (Bishop of Milan), Jerome (translator of the Vulgate), and Augustine (Bishop of Hippo, near Carthage), who wrote books and articles that were accepted as legitimate specifications of true Christianity. Augustine, born in 354 CE, converted from Manichaeism to Catholicism, and his writings contributed to the Catholic domination of Christianity. The Pope and the Vatican continued to expand Christianity throughout Europe after the sack of Rome, though philosophy was limited while Europe suffered from the “Dark Ages” from 500-1000 AD and “Mohammedanism” gained religious and secular control of many countries.

The next philosopher of note, Thomas Aquinas (1225-1274) contributed to philosophy by focusing on Aristotelian over Platonic philosophy. The Italian Renaissance (14th century) started the process of change from religious to scientific philosophy, and included Machiavelli’s The Prince (1510) on the principles of political power, as well as the works of Copernicus (1473-1543), Galileo (1564-1642), Kepler (1571-1630), and Newton (1642-1726) all of whom created improved scientific models.

Russell views Descartes (1596-1650) as the first modern philosopher, whose excellent writing style and Catholic upbringing enabled him to persuade scientists to include some Catholic ideas in evolving scientific philosophy. His early education at the Jesuit school of La Flèche provided a grounding in mathematics that contributed to his creation of a new model of coordinate geometry. His two most important books were the Discourse on Method (1637) and Meditations (1642), which explored the concept of Cartesian doubt, asserting that thinking was the central human activity and that “I think therefore I am” (cogito ergo sum) was the primary non-doubtful principle on which to base true reasoning. This implied that the mind as opposed to the body was the basis of philosophical reasoning. This principle was widely accepted by later European philosophers but was questioned by
British philosophers including Russell, which led to a rift between British and European philosophical thought that was partially responsible for political differences.

Britain’s Henry VIII (1491-1547) replaced the Catholic Church by the Protestant Church of England. The struggle between Protestants and Catholics led to the execution of Charles I in 1649 and to the Bloodless Revolution against the Catholic James II by the Protestant William of Orange in 1688, which made all future British monarchs Heads of the Church of England and of the Protestant faith.

Seventeenth-century British philosophers included Frances Bacon (1564-1626), who distinguished philosophy from theology, and Thomas Hobbes (1588-1679), whose book *Leviathan* proposed a new model of the State based on monarchy as opposed to parliamentary democracy. Newton’s *Principia* (1687) proposed a substantive scientific model (though he himself became religious in his old age). The philosopher John Locke (1632-1704) escaped to Holland during the Reign of James II and wrote his main works right after the 1688 Revolution. These included his *Essay on Human Understanding, Letters on Toleration*, and the *Treatise on Government*. Locke’s views were embraced by the British Parliament, by Voltaire in France, and later by the American Constitution. Locke was fortunate to pursue his political views precisely when they were being praised by British and foreign governments; and he is widely acknowledged as a founder of the modern liberal political ideas that developed during the three subsequent centuries. Locke is recognized as the founder of British liberalism, which focuses on widespread acceptance of positive ideas, and on British empiricism, which proposes that truth be based on the result of experiments rather than on *a priori* knowledge.

Locke was followed by George Berkeley (1685-1753) who denied the existence of matter, claiming that objects vanish when the perception of them disappears. (“If a tree falls in the forest…..”) Russell demonstrates that Berkeley’s views on matter were incorrect. Though a philosopher in early life, Berkeley later became a Bishop of the Irish Church and abandoned philosophy. (We note in passing that the University of California at Berkeley is named for him because, while living in Newport, Rhode Island from 1729-31, he had predicted that the American colonies would expand ever westward.)

David Hume (1711-1776) extended the empirical philosophy of Locke and Berkeley in directions that were widely studied but not entirely accepted. His books *Treatise on Human Nature* (1737) and *Inquiry into Human Understanding* (1750) proposed a skeptical form of empiricism based on rejection of induction and the implied rejection of causality. His arguments, widely endorsed by some philosophers, were rejected by Russell, who believed that induction is a legitimate logical principle, and were also rejected in the 18th century by some other British scientists and by European scientists like Immanuel Kant.

European philosophers after Descartes included Spinoza, Leibniz, Rousseau and Kant. Baruch Spinoza (1632-1677), was born in Holland to Jewish parents who had escaped from the Iberian Peninsula, and was ex-communicated because his views on ethics and belief in God differed from the traditional views of the Jewish community, which he refused to
accept. Spinoza’s work reflects modern religious views, and Russell considers him a major philosopher, who (like Galileo) was inappropriately ostracized.

Gottfried Wilhelm Leibniz (1646-1716), born in Leipzig, was a highly talented scientist and philosopher, who competed with Newton as a creator of the differential calculus. Russell considered him very creative but less admirable than other scientists because his desire for popularity influenced his philosophical expositions.

Jean-Jacques Rousseau (1712-1778), born in Geneva, was raised as a Calvinist. His poverty led him to espouse Catholicism for financial reasons. At age 35, he won a prize for an essay giving a negative answer to the question: “Have the arts and the sciences conferred benefits on mankind?” Its popular reception led him to take up writing as a hobby including literary novels like Emile. His final work, The Social Contract, proposed a form of political government that inspired the harsh strategies of Robespierre in the French Revolution, and (later) Hegelian political theory in Germany.

Immanuel Kant (1724-1804) developed a German form of philosophy, which differed from the British philosophy of Locke, Berkeley, and Hume and served as a basis for the German philosophers Fichte, Schelling, and Hegel. Kant spent his entire career teaching at Koenigsberg University, writing political works in his early years and, at age 63, the philosophical treatise The Critique of Pure Reason (1787), which explored the relation between empirical propositions specified by observation and a priori propositions that are inherently true. Thus “2 + 2 = 4” is an a priori proposition that shows that many mathematical truths are inherently true and can be proved by theorems, while scientific truths about the planets are empirically determined by observation.

Georg Wilhelm Friedrich Hegel (1770-1831), a disciple of Kant who initially welcomed Napoleon’s defeat of Prussia in the battle of Jena (1806), later became a supporter of the régime of Frederick the Great. Hegel’s initial philosophy rested on the dialectical belief that analysis of ideas requires the use of thesis, antithesis, and synthesis of concepts relating to reality and the existence of objects in the world. His dialectical analysis, though accepted by his successors and taught to Russell in college, has been discarded as a basis of modern philosophy. When he became a professor in Berlin in 1810, he shifted his attention to politics and presented a model of the State that was endorsed by the Prussian government, which encouraged Bismarck’s expansion of Germany into a united country and ultimately Hitler’s takeover of Austria and Czechoslovakia.

Karl Marx (1818-1883) - was born in Trèves (on the border of France and Germany) to Jewish parents who had converted to Christianity. He edited the Rheinische Zeitung until it was banned by the government for its left-wing politics, and in 1843 moved to Paris to study socialism. There he met Friedrich Engels, a German-born Manchester factory manager who taught him about English philosophy and politics. Marx participated in the French and German revolutions of 1848 and in the same year, Marx and Engels published the Communist Manifesto, which defined Communism as a basis for supporting poor against rich individuals.
Marx was forced to flee to London in 1849, and spent the rest of his life there writing his well-known *Das Kapital* in the reading room of the British Museum. *Das Kapital* provided a Communist foundation for championing wage earners over owners of industrial companies. His ideas were widely accepted in Europe, and underpinned Russian Communism (which however was later perverted by Stalin’s focus on eliminating people who disagreed with his politics).

Henri Bergson (1859-1941) was born and died in Paris. His father was a Polish pianist and his mother was British. He lived in London as a child, was fluent in both French and English, and returned to Paris as a 9-year-old. He received a prize for a paper on mathematics while still at school and studied as an undergraduate at the Ecole Normale Supérieure, where he later became a professor. His early books included *Time and Free Will* (1889) which discussed time and human behavior, and *Matter and Memory* (1896), which discusses human thought.

In 1798, aged 39, Bergson became a professor at the Collège de France. He presented a paper, “Psychological origins of the law of causality”, at the Congress of Philosophy in Paris in 1900, and an article on the nature of laughter, which examines what it is that makes people laugh. In 1907, he published *Creative Evolution*, which was received as a valuable new analysis of Darwinism. His writings gained him the Nobel Prize for literature in 1927, as well as awards from France and America for the quality of his work. His final work, *Morality and Religion* (1932), is a philosophical analysis of religion in general, including a positive evaluation of Christianity. Bergson’s death in 1941 occurred after Germany had conquered France; and he reaffirmed his Jewish heritage under German Fascism despite his endorsement of other forms of religious belief.

Russell also discusses two American philosophers: William James (1842-1910) and John Dewey (1859-1952). William James, the son of Henry James (a wealthy theologian), was a Harvard student, later appointed a professor of psychology and philosophy there. His two-volume work *Principles of Psychology* (1890) created and then expanded the discipline of psychology. James’ contribution to philosophy included a pragmatic definition of “truth” and also of “God” as a useful concept (though not necessarily a real entity). His books include *The Will to Believe* (on free will), *The Dilemma of Determinism*, and *What is an Emotion?*

John Dewey (1859-1952), born in Vermont, graduated Phi Beta Kappa from the University of Vermont and earned a PhD at Johns Hopkins University in 1884. He taught at Columbia University and Columbia Teachers’ College from 1904-1930, and in 1905 was elected president of the American Philosophical Association. He was among the founders of the New School of Social Research in New York City in 1919. His publications include contributions to teaching, psychology, and philosophy. He was one of three founders of pragmatism, along with Charles Sanders Pierce and William James. His books on education included *The School and Society* (1900) and *The Child and the Curriculum* (1902). He also discussed the relationship between education and democracy in *Democracy and Education* (1916). In the 1930s and 1940s, Dewey participated in social activism, which included some political initiatives sponsored by Bertrand Russell.
Bertrand Russell’s final essay, “Philosophy of Logical Analysis” examines the mathematical philosophy of Cantor and Frege and refers briefly to the physical philosophy of Einstein’s relativity theory and Bohr’s quantum theory.

Georg Cantor (1843-1918) invented Mathematical Set Theory and showed that real numbers are more numerous than natural numbers. Gottlob Frege (1848-1925), a founder of modern logic, contributed a book on the foundations of mathematics and an analysis of philosophical restrictions on language and mathematics.

Albert Einstein (1879-1955), whom Russell mentions at various points throughout the book, was a leading German-Jewish theoretical physicist who developed the special and general theories of relativity and the mass-energy formula $E=MC^2$, which was pivotal in establishing quantum theory. He moved from Berlin to Princeton in 1933 to escape Nazi persecution on account of his Jewish ethnicity.

Niels Bohr (1885-1962), a primary contributor to quantum theory, received the Nobel Prize for physics in 1922. He was also a philosopher of science and the head of the Danish Institute of Quantum Research. Bohr escaped from Denmark to Sweden in 1943 at age 58 to avoid capture by the Nazis, and worked with British and American scientists on the atom bomb to pre-empt its construction and use by Germany in World War II. However, both Bohr and Einstein supported Russell’s post-war proposal that all countries should agree to eschew atomic bombs -- a worthwhile proposal that has not yet been universally adopted.
Two Nineteenth-Century Russian Authors

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Fyodor Dostoevsky (1822-1881) and Leo Tolstoy (1828-1910) are among the greatest Russian authors during the golden age of Russian literature. Dostoevsky, born six years earlier than Tolstoy, died 30 years before him. Moreover, the greatest works of each author were published close to each other. Dostoevsky’s *Crime and Punishment* (1866) appeared three years before Tolstoy’s *War and Peace* (1869). The message of *War and Peace* is that peace is better for society than war, while *Crime and Punishment* portrays the human consequences of criminal acts as opposed to the political consequences of war. Freud prefers Dostoevsky’s focus on human relations, while those who are more interested in politics (like myself) prefer Tolstoy’s political novel.

Dostoevsky’s *The Brothers Karamazov* (1880) and Tolstoy’s *Anna Karenina* (1877) were published three years apart, like their earlier masterpieces. Both novels portray the inappropriate behavior of the Russian nobility. Here again, Freud approves of Tolstoy’s emphasizing feminine intransigence over Dostoevsky’s focus on male shortcomings -- which is also endorsed by modern psychologists. This suggests that Tolstoy’s choice of subject matter is more closely related to modern analysis than Dostoevsky’s, though both were equally profound in their writing style.

When *War and Peace* came out in 1869, Dostoevsky was very impressed and wanted to meet Tolstoy. But the two authors came from very different backgrounds, Dostoevsky being an impoverished proletarian and Tolstoy a member of the landed aristocracy. Despite the fact that both moved in Russian literary circles, they never actually met -- even when occasionally attending the same gatherings, for instance at the tribute to Pushkin held in Moscow in 1880. (There is some evidence that Tolstoy did not reciprocate Dostoevsky’s desire to meet him, though after the latter’s death he expressed regret about this.)

Dostoevsky’s left-wing views led to his imprisonment in Siberia for five years while in his 30s, and to his writing about the experiences of prisoners like Raskolnikov in *Crime and Punishment*. By contrast, Tolstoy fought on the Russian side in the Crimean War of 1855, which led him to discredit warfare in *War and Peace*. Both authors wrote their masterpieces while in their 40s, and both seem to have had similar ideas about the function of literature, in response to the actions of their government in the 1860s - 1870s. Each read and admired the other’s writings, and they may have influenced each other’s style and content in spite of their separate though overlapping lives.
A Half-Century of Introductory Books on Engines, Turbines and Thermodynamics: An Unexpected Rise in Inaccuracy

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Abstract

Much of what we blame as the prime source of global warming is wide use of engines (such as in autos and railways, and having reciprocating pistons) and turbines (as used in power stations and many aircraft, involving curved blades mounted on rotating disks). Engineers and others are taught about these in universities. There are introductory textbooks.

Before 1940 these books were very practical, illustrating real and specific engines and turbines. Beginning in the 1940s there was a change, initiating from MIT, and my thesis here is that several authors have widely lost touch with practical aspects, presenting needless factual errors in statements, diagrams, and sample problems with solutions. For those students who take more advanced courses, where the correct applicable practices are used, this becomes problematic – they are asked to accept that something taught in an earlier course was incorrect, and much the same issue for them occurs if they take jobs in the corresponding industry.

Apart from the authors who generate such texts, the primary gatekeepers for accuracy are the publishers’ representatives who accept the material provided. Just as for research articles, where refereeing by independent experts is the norm, these publishers representatives can seek and obtain expert referee reports, even if they have to be paid for. If publishers were made more responsible for publishing erroneous texts, such as being required to refund all students their tuition fees and book costs for courses in which such engineering texts were used, just as auto manufacturers have to make good any defects in their automobiles found in practice, the incidence of such needless errors of fact could be reduced.

Introduction

The high latent heat of steam was observed about 1764, the year Brown was founded. Steam power for driving factories, electricity generation, rail and marine uses was widely applied by 1900. Corliss in Providence was a 19th century inventor and manufacturer, in such industry.

Joseph H. Keenan (1900-1977), became the author of a famous book in the history of Thermodynamics. Obtaining a bachelor’s degree from MIT in 1922, he became a designer of steam turbines for General Electric until 1928 when he turned to teaching and became Professor of Mechanical Engineering at MIT in 1939. His book, “Thermodynamics,” Wiley 1941, has 26 chapters, each having a Bibliography (sometimes citing works not in English) and a set of Problems, and showing his thoughtful experiences from steam turbine design. Chapter 6 is noteworthy for introducing the first icon, there for a (steam) turbine.
Icons had long been used in diagrams of electrical circuits, e.g. two parallel flat plates with a gap to show a condenser, a coil for an inductor, and a zig-zag line for a resistor. Here, Keenan uses a simple outline of a truncated cone as the icon for a turbine, adding an inlet flow line as if tangential at the narrower end, a collection hood spanning the outlet end to collect exhaust steam to go to a condenser, as well as a line from the center of the (wider) exit end on axis where an output driven shaft would be centered, with an arrow to show it is where power is coming out.

A key feature of such icons is that they do not divulge practical details of how the parts work in detail on the inside. This was a new departure. However, Keenan does illustrate multistage turbines later in the book, both impulse (GE, p.160) and reaction (Westinghouse, p.161) types, in sectioned assembly drawings. There is an obvious attraction to using an icon while lecturing – it is quick to draw on a blackboard, and for a point being made at the time it may be enough. However, it is at best a shorthand notation, and no real excuse for the author or an instructor not knowing what the reality is like.

Keenan's Chapter 11 is about The Steam Turbine, beginning on p. 125, and shows Keenan's practical experience with plenty of detail. He goes into performance detail for the Converging-Diverging Nozzle from p.143, notably including as Fig.77 some experimental results from a paper by A.M. Binnie & M.W. Woods in Proc. I. Mech. Engrs vol 138 on p. 260, 1938 – including what looks like a condensation process beginning deep in the divergent phase. Later books omit such details. Keenan's Chap. 12 begins on p. 175 on Heat Engine Cycles including on p. 184 another icon of a tapered turbine with a condenser duct attached at its tail.

An early additional textbook which explicitly acknowledges Keenan having set a new model is "Engineering Thermodynamics: An Introductory Text," by D.B. Spalding and E.H. Cole, published by McGraw-Hill in 1958 as its first edition. Chapter 1 includes a Historical Introduction, using engineering drawings or simplified versions of them. They use a very simplified diagram of a triple-expansion steam engine on p.111, but Keenan-style icons in diagrams for closed-cycle and open-cycle gas turbines, p. 173, yet good sectioned views for the Boys Gas Calorimeter, Fig. 16.6, p. 345, and for the Griffin-Sutton bomb calorimeter (used for liquid or solid fuels) in Fig.16.7, p. 346. Steam Tables are abridged from J. Keenan & F.G. Keyes, 1937. Spalding & Cole include a Section on Air-Water mixtures, Fig. 15.14 illustrating a cooling tower with air entering at the bottom.


Reynolds, W.C., of Stanford U, published Thermodynamics with McGraw-Hill in 1965, and acknowledged influences not only of J. Keenan, but also H. Callen, M. Tribus, and M. Zemansky, and his first use of the Keenan turbine/compressor icon is on p. 107, for a heat-pump compressor. (My copy includes a loose sheet of errata.)
G. Van Wylen, R.E. Sonntag & C. Borgnakke wrote “Fundamentals of Classical Thermodynamics,” 4th edition, Wiley 1994, and present there a problematic Fig.1.1, Schematic diagram of a steam power plant. It seeks to show all heat transfer is entirely by convection, which is not the reality.

Such a concern invites examination of how Babcock & Wilcox describe what happens. Babcock & Wilcox as a major company building and selling steam generating equipment, have published “Steam: Its Generation and Use” under its own imprint and several editions, so taking e.g. the 1972 edition, differences in practice are described by Babcock & Wilcox with boiling carried out by radiant heating, rather than convective heating to achieve boiling, and typically with vertical tubes. The reason for this was known empirically decades ago, it involves the so-called 'boiling crisis' when the surface in contact with water is hotter than the boiling point by enough degrees a cushion of low-conductivity vapor forms a relatively insulating cushion on the inside surface, well described by Novak Zuber and colleagues in the late 1950s and 1960s. A convenient feature with radiation heating in a furnace is that the radiation heat flux to a patch of tube wall is reduced when the wall temperature rises, so that combined with internal liquid water flow conditions it can keep the boiling more predictable. However, ignorance of such practical issues, and lacking iconography details to illustrate radiant heating rather than cross-current convective heating, seems to have led the iconographer into stacking components differently from reality in Fig. 1.1 of Van Wylen et al. Babcock & Wilcox provided in their 1972 edition a power-cycle components diagram on page 2-15 as Fig.8 (including a Keenan-style turbine icon with full-width exit steam collection for transfer of the exiting steam to the condenser) avoiding such an error as noted for Van Wylen et al.

Another book, published at the end of the century, is M.J. Moran & H.N. Shapiro’s “Fundamentals of Engineering Thermodynamics,” 4th edn. 2000 (Wiley), and the Preface mentions it continues with a basic objective “to prepare students to use thermodynamics in engineering practice”, and states enough material is provided for a follow-up course dealing mainly with applications. However, when it comes to a chapter on Vapor Power Systems it does not even follow Van Wylen et al’s example of including a diagram of a real one, e.g. from Babcock & Wilcox, and in Fig. 8.1, p. 373, there is a Keenan-style turbine icon, even a simple diagram of an electrical generator and an outline of a cooling tower, but with no air entering at the bottom edge of the tower’s skirt, unlike the one shown in Spalding & Cole’s mid-century text. Cooling towers can act as a source of Legionnaires’ disease.

In Chapter 9 Moran & Shapiro mislead their readers in Fig. 9.1. on basics for reciprocating air-breathing piston-cylinder engines. They show a piston going up and down in a cylinder, with a simple crank mechanism, a spark plug or fuel injector in the center of the cylinder head, and two valves; however, the valves lack port passages in which inlet or exhaust gases could pass – extremely basic to engine operation. Further, Fig. 9.2, is claimed to be the Pressure-displacement diagram for such an engine, and has a ‘Power’ stroke bulging out, convex away from the origin, which would occur only if a substantial combustion reaction occurred throughout the stroke, which it does not; it is way out of proportion. Even their own Fig. 9.3, pressure vs volume diagram for an air-standard Otto cycle is concave towards the origin during both compression and expansion strokes, more correct.
As Moran & Shapiro’s Chapter 9 continues into discussing gas turbines, starting on p. 440, the ‘Keenan’ icons for compressors and turbines become abundant, and it is where the Chapter moves into Section 9.9 on Gas Turbines for Aircraft Propulsion that more incorrect material is to be found. Fig. 9.20 of a turbojet schematic indicates an open tube of smoothly-varying diameter having compressor and turbine rotors which have no stator components and abundant radial clearance beyond the rotating blades, those being shown as straight in profile (which does not work) and combustors which are shown as simple flames, and the essentials of divided flows to permit combustion at a workable air/fuel ratio and subsequent dilution with excess air before meeting the turbine blades – issues which had to be solved to make them work – not indicated at all. On p. 472 the internal distinctions between turboprop and turbofan engines are much oversimplified, and an incorrect statement is made about turbofans: “This bypass flow provides thrust for takeoff, whereas the core of the engine provides thrust for cruising.” This is not true: both bypass and core engine provide significant thrust for both take-off and cruising, and a practical motivation for bypass is completely missed, although it goes back to the early 1950s – M.J. Lighthill wrote a major paper about the level of jet exhaust noise (On sound generated aerodynamically. I. General theory. Proc. Roy. Soc. A 211 (1107), pp. 564-587, March 1952), and showed it would be proportional to the eighth-power of the jet exhaust velocity when subsonic. It became immediately apparent to engine designers for civil aviation they needed to reduce the velocity of the core-engine jet by adding stages to the turbine part and use shaft power from that addition to drive a lower air-exhaust speed from the fan part, spreading the propulsive momentum over a much larger total flow of air – and with the core-jet exhaust velocity reduced thereby. This is an important practical issue, as it permits airports to be placed closer to the population centers which provided most civil passengers, sound emission to the ground being strong during the take-off and landing phases when planes are not high in the sky as at their cruising altitudes. To find this point missing in a book published close to 50 years later illustrates the lack of connection with practical realities which has arisen. Even if the noise issue was ignored, it makes more sense energetically to apply the engine power to achieve a change in momentum with velocities closer to the planned speed of the aircraft. Jet engines with by-pass fans have helped civil aircraft be capable of very large ranges without in-flight refueling, and even for military purposes have been employed for powering vertical take-off and landing aircraft.

In fairness it should be pointed out that some English language-texts late in this half-century show greater closeness to realities for engines and turbines than Moran & Shapiro, such as G. Rogers & Y. Mayhew with “Engineering Thermodynamics: Work and Heat Transfer,” 4th edn, Longman Scientific & Technical (1992), and co-published in the US by Wiley. Rogers & Mayhew have a cartoon of a spark-ignition engine in their Fig.17.1, on p. 396, with valves shown in the cylinder head and a spark plug between, and with an inflow open duct with air and fuel being provide there with an arrow showing where those would go in, and a separate valve for the exhaust with an arrow showing products of combustion coming out via an exhaust duct. In Fig.17.3 Rogers & Mayhew show the simple two-stroke engine basics of breathing in three figures side-by-side, the first (a) with air entering the crankcase through a one-way valve, the second (b) roughly 180 crank-degrees later with exhaust gases already blowing out through the exhaust port, and the third (c) roughly 30 degrees of rotation later and with compressed air from the crankcase rising to blow into
the engine cylinder proper, directed by the deflector top of the piston to minimize mixing with the exhaust gases still leaving by the exhaust port. Fig. 17.4 shows a three-lobe Wankel engine, as a rotary engine, and in the text Roger & Mayhew explain for this practical implementation its major disadvantages as found in practice. Rogers & Mayhew give 5 pages of references for students to consult, pp.692-696, and in full disclosure I acknowledge that one of them, Part IV reference 20, is to a long paper which my late colleague Joseph Kestin and I wrote in the 1960s about heat transfer in turbulent flows. (Moran & Shapiro give references only to sources for Tables and Graphs which are included in their book.) Also in full disclosure I acknowledge I had met Spalding, Cole, Lighthill, Reynolds, Keenan, and Keyes, among the authors cited above.

Rogers & Mayhew, p.41, show a simple boiler of the early, lower pressure type with inclined tubes for furnace gases to pass over, and use this shape iconically later. They discuss heat transfer processes per se, later in the book, including regimes in pool boiling, Fig. 22.20, and in Fig. 22.24 – a tall vertical tube with boiling inside, starting as water, passing through some distinct regimes leading to a mist and finally by stage G it starts being superheated in a gaseous phase. An alert instructor has the means there to tell students the input heating can be by radiation in a radiation boiler for steam plant, but Rogers & Mayhew do not explicitly make that connection there. Rogers & Mayhew discuss vapor power plants in terms of thermodynamics around icons of components for vapor cycles in Chapter 11.

The title of Rogers & Mayhew’s text is reflected in the book structure: the thermodynamics with little reference to details of practical implementation is described in Part I and II, to be followed by a set of Chapters on Work Transfer in Part III and on Heat Transfer in Part IV; thus much of the practical implementation is given in more detail in those two later parts, and of particular interest is that involving turbines, which are used in both vapor (steam) and gas cycles. This permits some economy of space and time, it is mainly in the variation of working-substance properties that vapor and gas cycle turbines differ. Over-expansion in steam turbines can lead to formation of a mist, which can be erosive if left to continue for too many years.

It fell to a graduate student of Joseph Keenan, A. Shapiro, to straighten out analytically the compressible flow aspects for flow in convergent-divergent nozzles. Parsons and others had already determined the two main types of turbomachine sections, ‘impulse’ and ‘reaction’, which can be entered in successive stages. In understanding this part of turbomachine analysis it is important to have a grasp of vector trigonometry as well as thermodynamic states in rapidly-moving gases. Rogers & Mayhew review essentials of this in Chapters 18 and 19, thereby presenting information on practical implementation, whereas Moran & Shapiro skip this and go into some chemical thermodynamics instead.

An introductory book deliberately written restricted to gas turbines is by H. Cohen, G.F.C. Rogers and H.I.H. Saranamutto, “Gas Turbine Theory,” Longman Scientific and Technical Publ, co-published by Wiley, and I cite from the Third Edition with a Longman Group Copyright date of 1987. On p.12, the authors’ remark: “At high subsonic speeds a propulsive jet of smaller mass flow but higher velocity is required. This was originally
provided by the turbine jet engine, but these have been largely superceded by turbofan (or bypass) engines . . . This results in a jet of lower mean velocity which provides not only a better propulsive efficiency but also significantly reduces jet noise.” On p.29 there is a diagrammatic figure entitled ‘Typical gas turbine design procedure,’ and includes many steps not described in the book. Appendix C, pp. 402-406, lists more than 70 relevant references, which do not include Lighthill’s classic papers, which would be too advanced mathematically for the intended readers of this book. In Chapter 1 they begin by using Keenan’s icons, but by Sect. 1.4 the authors include 3D perspective and 2D simplified engineering sectional drawings of real, named examples.

Another track to explore before discussing the apparent shift in emphasis in textbooks is to review the publications available to the general public. In the UK in particular there had been widespread attention to how things worked. Publishers of magazines such as The Cyclist and Cycling engaged artists to show mechanical developments, with diagrams which were accurate yet easy for a layman to understand. Some publishers (such as Chiltons) found a niche in the market for handbooks on particular auto models, well-illustrated, which allowed owners to repair their own vehicles. Also, soon after WW II was over, weekly (such as Motor and Autocar) and monthly magazines became available about cars, often including good perspective drawings of engines and other parts, with similar magazines about aircraft. The editorial artist became a visualization journalist, and competition seemed to drive the standards up. Flight International (originally just Flight) began as early as 1909, being bought in 1934 by Iliffe Associated Press. Max Millar, who produced his first drawings for Flight as a freelance in 1912, preferred to be called an “engineering artist”, and perspective cutaways evolved to be very understandable by the public. An early aircraft piston engine of Max Millar’s was the Napier Rapier published in Flight in March 1935: it is an H-configuration, air cooled, each side having its own crankshaft, the rear centrifugal supercharger with radial blades, the pushrod operated overhead valves, flat-topped pistons, the reduction gearing from each side going to the shaft for the propeller and so on all unambiguously shown. A similar quality prevailed with Frank Munger’s Rolls-Royce Pegasus, published in Flight International in October 1972, a gas-turbine engine used for VTOL (vertical take-off and landing), airflow from the bypass fan being used by the forward nozzles and gas flow from the core engine being used by the rearward nozzles – and all nozzles could be turned to achieve forward flight once off the ground, but could be turned back to make landings. Tim Hall’s detailed cutaway of the Rolls-Royce Trent 800, a high-bypass turbofan jet engine, was published (Flight International) in September 1996. Thus such skills could be applied throughout the publishing history of introductory thermodynamics books as reviewed here, and while simplified versions have been used in texts such as Rogers & Mayhew, there seems to be no excuse for the inaccurate drawings in, e.g., Moran & Shapiro. It is quite easy to pose problems for students to solve which do not respect engineering realities, yet “satisfy” the First and Second Laws of thermodynamics, and may impress a generation brought up watching Star Wars. The real world, the domain of practical engineering, enforces its own realities and students need to learn how those are accommodated.
Discussion

As a medical physiologist (besides a mechanical engineer) I believe a book including discussion of the human heart would not be published as showing there was no open blood vessel (the vena cava) going to the heart and no valved, open blood vessel (the aorta) leading from it; no publisher would expect to get away with that. However, that is the physiologic analogy to Fig. 9.1 in Moran & Shapiro. The latter is even stranger when one compares Fig. 17.1 in Rogers & Mayhew with it, which Wiley, publishers of Moran & Shapiro, co-publish, and with Figures in Cohen, Rogers & Saranamuttoo, which Wiley also co-publish. Book authors have often complained that publishers restricted them, even in deciding what could be in an index, but this does not seem to be the issue here. Also, Fig. 9.22 in Moran & Shapiro has been produced with stencils and extremely weak relation to reality. This is a great contrast, for example, to the Chapter on Blood flow and blood supply to the heart in G.J. Tortora & B. Derrickson’s Introduction to the Human Body The Essentials of Anatomy and Physiology, 7th edn, Wiley, 2007.

The basic problem with icons in this context is that there is no obligation on an instructor to represent reality fairly and properly. Use of the First Law of Thermodynamics only needs to satisfy the basic energy balance and, just as in financial accounting, the accountant may use an ‘illegal’ activity (i.e. one which is not a real representation of what would actually occur). The example in Van Wylen et al is an illustration: to avoid discussing the role of radiant heat transfer as in Babcock & Wilcox – and others – real product lines, a fake path to make that part ‘easier’ in the collective icon has been introduced. It saves textbook writers who choose that path from showing students what really happens, and from even knowing those things themselves. This impoverishes the students, who have come to learn. New, young faculty may be recruited largely for their promise in research and, unlike faculty in a medical School, not for having the extra time of hands-on training with the real thing (i.e. patients, in medicine and surgery, or reciprocating engines, rockets, and steam and gas turbines in mechanical thermal engineering), and subsequent courses devoted to those topics have to start ‘further back’ to overcome the errors in such introductory courses. Unfortunately automobiles have become more complicated to service since the 1970s, usually needing proprietary electronic codes for diagnosis, and casual introduction to related mechanical engineering in contemporary popular journals is very limited.

How are such situations to be remedied? Is there a model in Ralph Nader’s ‘Unsafe at Any Speed,’ which sought to remedy poor safety design of US automobiles and was provoked largely by the original Chevrolet Corvair? That led ultimately to Government regulations – and safer automobiles. Those who supported a free-market theory, to let the public decide in the marketplace, did not prevail. Under safety regulations all car models sold need crash tests with dummies in the vehicles, seat belts and ‘air’ bags, steering columns needed not to be rigid and straight to a part forward of the engine, and so forth. VIN numbers were introduced, so autos not yet repaired to overcome defects built in could be traced. (We learned recently millions of airbags, found to have dangerous defects, are to be recalled.) Who might file suit regarding poor textbooks – perhaps the parents of undergraduates who took courses based on conspicuously erroneous texts, they might sue because they’d paid tuition on the expectation publishers would not provide such texts,
that instructors would avoid using them, and end-of-course opinion polls of students might not yet show them how poor their textbooks had been.

Or is the answer in matching how biological safety is regulated in Universities? In that, we have Institutional BioSafety Committees which have to function, by Federal law, with strict procedures and reviews of laboratory and training requirements before experiments in the laboratories may proceed, NIH is the Federal Agency which overlooks regularly, meetings have to be held, votes made and recorded, so there is a distinct trail of the responsible overlook – and this applies even if the biology simply involves studying wild rabbits in fields.

Text book publishers are there to make money, like auto companies, but it should be with responsibility. The aeroplane industry acted more this way spontaneously, after a few de Havilland Comets crashed unexpectedly in the 1950s that design of aircraft stopped flying and there was a research project on why crashes had occurred. There was a discoverable reason. Perhaps publishers should be prepared to stop selling unfit books. Authors might regret the loss of income from their royalties, but publishers could point out those authors had not sought to remedy critical errors. Scientific research papers are being withdrawn, increasingly. This is not a freedom-of-speech issue, it is about accuracy, reputation, and responsibility in a professional setting.
FACULTY BULLETIN

INFORMATION FOR CONTRIBUTORS

GUIDELINES FOR SUBMITTING ARTICLES:

The next issue of the Faculty Bulletin will be published this fall. Articles should be submitted by late October for publication in mid-November.

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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