

INTERFACE

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New Link Speeds Research at Dartmouth

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Dartmouth's network connection to other research institutions became much faster in late December, when a new link between Hanover and the New York City area was turned on.

The connection to the national very-high-speed Backbone Network Service (vBNS) fulfills an important part of a two-year, \$350,000 grant from the National Science Foundation for the design, installation, and management of a high-speed connection for Dartmouth researchers.

"We've passed a major milestone in this project," said Director of Computing Larry Levine. "This means that the research applications that were waiting to take advantage of this high-speed link can now proceed."

The vBNS started out as a dedicated link between national super-computer centers, and now links more than 870 networks around the country.

The connection from Hanover to West Orange, NJ, transfers data at speeds up to 45 megabits per second. By contrast, Dartmouth's current link to the Internet can operate at up to 3 megabits per second.

If traffic from Dartmouth is bound for another vBNS network, it will be switched to the faster connection

automatically. That should alleviate traffic on the smaller link, bringing a boost in performance for many Internet users.

At some point in the future, the connection for regular Internet traffic will be switched into the vBNS link. That will bring even faster performance, in such a way that research uses are assigned the highest priority during busy periods.

Levine said the next step in the project is to support faculty who may need expert help as they deploy their network-dependent research applications. Computing Services will also continue to urge Bell Atlantic and MCI, the two vendors who supply the connection between Hanover and New Jersey, to make available an even faster vBNS link of 155 megabits per second. Special thanks to Stephen Campbell and Punch Taylor of Technical Services for their hard work in making this connection a reality.

To see a list of vBNS networks and their associated institutions, check out <http://www.vbns.net/netmaps.html>. Details regarding Dartmouth's Internet 2 project are available at <http://www.dartmouth.edu/comp/news/i2/>

Computing Code Is Updated

The Council on Computing approved revisions to the Computing Code at its meeting January 22, 1998.

The *Dartmouth College Computer and Network Policy* contains Dartmouth's philosophy and requirements governing student, faculty,

and staff use of its information technology resources.

More information about the Code will appear in the Spring 1998 issue of *Interface*.

The new version is at <http://www.dartmouth.edu/comp/code.html>

Berry Library: A Special Report

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On The Cover: An altered rendering of the façade of Berry Library from project plans on display at Baker Library. This page: Rock climber on Gerry Hall. Credit for all photographs in this issue: College Photographer Joseph Mehling '69 (pages 21 and 22, Computing Services archives).

From the Start, Berry Planning Guided By Task Force Report

One of the most valuable parts of the Berry Library planning process has been a slim, perfect bound book, the Report of the Task Force on the Library of the 21st Century: The Berry and Baker Libraries.

Participants in both the early task force sessions that set forth the vision for Berry Library and the subsequent program development phase say the 51-page report has played a key role in guiding the huge and complex process of creating a radically new type of library.

"The Task Force report has been essential to the work we've done during the past year and a half," said John Crane, chair of the Library Building Committee and the Library's Director of Administration.

President James O. Freedman appointed the Task Force in October 1993. His instructions: "to think creatively about Dartmouth's library facilities of the future, particularly with regard to information technology, and to make recommendations about the design and function of the new Berry Library."

The group, under the leadership of William C. Scott, Humanities Distinguished Research Professor and Dartmouth Professor of Classics, adopted a practical attitude from the start. For example, the "committee" quickly became a "task force" "because we never worked like a committee," Scott said. "We had a job to do. We decided early on that we had to build the (library) program from the bottom up. We had to decide what we wanted in the new library."

During the first term, the Task Force set about gathering input from the Dartmouth community. Roughly 5,000 letters and e-mails were sent to people throughout the campus and

The Berry Gift

Berry Library is named for John W. Berry '44, of Dayton, Ohio, and his family, who donated a total of \$27 million to Dartmouth. John Berry's gift of \$25 million is the largest individual donation in the history of the College. His son George Berry '66 and the Loren M. Berry Foundation, established by John Berry's grandfather, each committed an additional \$1 million.

The project also received a \$3 million donation from George F. Baker III of New York City, whose great-grandfather George F. Baker made the 1926 gift that made Baker Library possible. All told, with subsequent gifts by Mr. Berry and Mr. Baker, the total gifts of \$35 million are the largest benefactions in Dartmouth's history.

walls on Bradley and Gerry for the benefit of rock climbers, should those buildings be torn down.

Those suggestions sparked some discussion in the Task Force about how to frame the report — should it be general and focus on outlining a broad vision? Or should it contain a range of specific design recommendations? The group decided to keep the recommendations fairly general.

"The Task Force didn't have to do the figures," Scott said. "Our charge was to assess Dartmouth's needs for the next 20 years, and the building committee would then try to meet as many of those needs as possible, within the space and budget for the new library."

The Task Force did have to be aware of some broad limitations, because many elements that might be included in Berry simply would not fit in the planned amount of space. That's where having a broad membership on the Task Force was especially helpful.

The group's members hailed from all corners of the College — students, faculty, and staff, and from every school, including the professional schools — "as broad a group as it could be," Scott said.

The intent was to bring a wide range of viewpoints into the process, especially from faculty and students, Dyer-Chamberlain said. The result would hopefully be a library plan that could be claimed by everyone in the community, developed by a representative group that could give the plans a broad, institution-wide endorsement.

The final report, released in May 1995, contained the basic design goals that have guided the project to this day. Among the points:

beyond, inviting comment on the project.

The feedback was assembled and considered during subsequent terms. Many good ideas came out of the comments — including the concept for the 24-hour cafe. There wasn't any food service in that area of campus, and the cafe fit the notion of encouraging people to be in the library, Scott said: "It linked into the idea of village culture."

"People wanted everything to be in this library," Associate Provost Margaret Dyer-Chamberlain, a member of the Task Force, said. Some of the suggestions were quite specific. For example, there were notes about retaining the granite



A view toward the west of the combined Baker and Berry libraries, as viewed from an architect's model.

- Berry Library should be integrated with a renovated Baker Library, “to serve as a crossroads of the campus.”

- Berry Library should have space “for user education in a range of print and electronic information formats.”

- Berry Library’s design “must allow for and enable the expansion of cooperation between the Library staff and the Computing Services staff.”

- Space in both Baker and Berry “must be designed with maximum flexibility in order to permit easy adjustment to emerging technology as well as changes in staff organization.”

- “Resources for information technology should be spread throughout

The final report, released in May 1995, contained the basic design goals that have guided the project to this day.

the building and made available to all users.”

Those broad goals are in the minds of many Library Building Committee members, because many of them were members of

the original Task Force. And the report’s goals proved flexible enough to accommodate some tremendous pressures — such as the need to demolish Kiewit and to reduce more than 300,000 square feet of desirable program elements to fit into 200,000 square feet of space in the combined Berry and Baker libraries.

The Task Force process itself is apparently unique for a project of this scale, Scott said. During a recent meeting of the Society of College and University Planners, Scott and Dyer-Chamberlain discussed the project at a very well attended panel. “They were blown away by the amount of time, effort, and care we took in developing a plan,” Dyer-Chamberlain said.

For Architects, the Berry Project Takes Function to A New Level

Geoffrey Freeman, of the Boston-based architectural firm Shepley Bulfinch Richardson and Abbott, is recognized as the pre-eminent library architect in the United States. And of all the recent projects Freeman has been involved with, the Berry Library project is setting the standard for academic library design.

While other recent library projects have integrated some degree of technology into traditional, collection-centered facilities, the Berry project brings the two together on a new scale. That in itself is very exciting, Freeman said, because other libraries with modest technology components have seen usage explode.

A variety of factors prevented other schools from undertaking more ambitious experiments in library design. However, Dartmouth's circumstances have differed in important ways right from the start, Freeman said, and have combined to create a library project that is truly visionary in scope.

For starters, both Freeman and Shepley Bulfinch partner Carole Wedge point to the stabilizing influence of the Task Force report as a way to keep all interested parties on the same track.

"The task force report continues to inform the mission here," Wedge said. "Every time we go to do another presentation, we go back and check ourselves against the report, and it's always rewarding to say yes, that is what we're doing.

"The report sets up a very interesting kind of parallel check for the planning process," she said. "The report is as relevant now as it was a year and a half ago because it was written by a much broader group

A Shepley Sampler:

Emory University Center for Library and Information Resources:

<http://clair.library.emory.edu/>

Leavey Library, University of Southern California:

http://www-lib.usc.edu/Info/Leavey/About_Leavey.html

Walsh Library, Fordham

University:

<http://www.fordham.edu/whatnew/watchit.html>

Widener Library, Harvard University

<http://preserve.harvard.edu/new/lab.html>

than is participating in the day-to-day planning. I think that keeps (the library design process) really plugged into the mission of the institution."

Another key difference from other projects, according to the architects: the working groups setting final details for Berry are more open-minded and less territorial about protecting their organizations than at other schools, Freeman said. That has set the stage for a level of collaboration that is unprecedented in projects of this nature.

Part of that willingness to collaborate is tied to the traditionally strong service component of Dartmouth's library, Freeman said. The historical measure of an institution's library has been collection size — the number of volumes contained in the stacks. Expansion of the collection was always the priority, especially at big research universities, and it often came at the expense of staff and user workspaces, Freeman said.

However, those institutions are now saddled with the legacy of those massive collections, Freeman said. They're now committed to the expensive task of preservation, and as a result, any thoughts about integrating computing technology becomes a "second cousin" behind the needs for climate-controlled stack space.

Dartmouth's historical experience is quite different, and allows for a much different result, Freeman said.

"The College has always kept its collection proportionate to its needs and more flexible, with an emphasis on use and service and scholarship," he said. "It's now in a position to have a very fine collection and be able to move the building in a way that's much more responsive to combining and using different formats, to focus on the service of information rather than simply the storage of information."

Similarly, Dartmouth's strong, centralized computing organization is a unique asset, Freeman said. Many schools that embark on the mission of combining media resources with computing and a library often have decentralized computing operations, and bringing those elements together under a single roof can be difficult. By contrast, Dartmouth's computing group starts on a much more equal footing with the library, Freeman said.

"It is extraordinary, both what the library has offered for services, and what Kiewit offers in terms of computing to the faculty and students. We don't see that breadth and depth of services in any other institutions," Freeman said, and that makes it much easier to sustain a "rich, dynamic, and open conversation"

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Carole Wedge and Geoffrey Freeman of Shepley Bulfinch Richardson and Abbott with a model of the north campus.

Exterior Form Follows Interior Function

Another distinguished architectural firm has been working on plans for the exterior of the Berry Library and its integration with the icon at the heart of the Dartmouth campus, Baker Library.

Venturi, Scott Brown and Associates is recognized as one of the most important firms in the United States. Its principal partner, Robert Venturi, has been hailed as the source of the most influential ideas in late 20th century architecture.

According to background material from the College, Berry Library's design deliberately

avoids "competition with the grand, neo-Georgian façades of Baker Library." Berry Library will not be visible from the Dartmouth Green, and the landmark Baker Tower will be visible above Berry when viewed from the north.

"The main façades of Berry Library are contemporary in nature yet draw on sturdy and much-beloved New England vernacular architecture found in classic villages and towns throughout the region," the press release states. Berry's loft-style architecture, which allows for tremendous flexibility in the interior spaces, recalls "mill buildings and

Main Street business blocks of the early 19th century."

The long façade of the building is gently angled, so its entire mass would not be evident to passersby. The ground floor also includes an open, continuous free-standing arcade that also helps to reduce the building's size while also identifying an important pedestrian walkway.

Inside the low-key front entrance is another Venturi trademark: a monumental staircase that leads up to the first level, the heart of the library and computing services offered in Berry.

Common History, Themes Link Computing and the Library

To understand why the Library and Computing Services are growing closer together, consider their recent histories. Both organizations have seen immense changes in technology during the past 30 years, yet each has ended up with more of a service focus than ever before.

The active history of Computing Services begins in earnest in 1959, when the College acquired its first computer. At first, computing revolved around big machines housed in a central, climate-controlled room. The machines weren't particularly easy to use, and were always kept apart from general users, said Director of Computing Larry Levine.

However, in the early 1960s Dartmouth mathematicians John Kemeny and Thomas Kurtz saw the earliest computers as teaching tools that could be used to enhance the teaching and learning process by developing critical reasoning skills, Levine said. It was their focus on extending the use of computers into areas that were considered radical at the time, such as undergraduate education and administrative uses, that created an early focus on making technology accessible to all.

The change to a distributed, networked desktop environment took place gradually, but it turned the machine-centered computing model on its ear. When the campus data network was installed in 1984 and Apple computers were offered at steep discounts to students, more than 70 percent purchased one.

"During the mid-80s, computing worldwide took a leap from the few, the nerds and the wizards, to a common tool used by everyone," Levine said. "And we're still taking that leap, with the Internet, the Web,

Like Kiewit and its special Machine Room, libraries were built primarily to house their collections, with staff and users as secondary priorities.

and e-mail. Dartmouth first took that leap in the 60s."

The focus in Computing Services became increasingly support oriented — answering questions, teaching people how to use the new tools to best advantage — as a distributed model of computing took hold — a pervasive and extensive networked environment where each user had a powerful computer on their desktop. The change is perhaps best reflected in the architecture of Kiewit: First constructed with a large Machine Room and an empty basement, staff offices now stuff the basement. New offices continue to be carved out of space in the Machine Room, as those machines continue to shrink.

A similar change has been taking place in libraries, where the acquisition and maintenance of collections was the historical point of emphasis. Like Kiewit and its special Machine Room, libraries were built primarily to house their collections, with staff and users as secondary priorities,

said library architect Geoffrey Freeman of Shepley Bulfinch Richardson and Abbott of Boston (see related story).

Unlike other academic libraries, Dartmouth's strength has always rested in its services for users, said Librarian of the College Margaret Otto — in helping users to navigate what has been a very functional collection. But those services have grown in recent years beyond what the original Baker designers had anticipated. For example, the reference office on the first floor was originally created for a single librarian, Otto said, and the library administrative offices now have an extra floor built into a high-ceilinged space.

As Computing Services has mushroomed during the past 30 years, technology has pervaded nearly every aspect of academic life. The Library is no exception. Director of Library User Services Phyllis Jaynes can recall the use of electronic information systems at Dartmouth when she first arrived here in the early 1970s.

That has made the Library's collection much richer, but also more complicated, she said. Some had predicted that electronic tools would reduce demand for library services, but the exact opposite is happening, Jaynes said. "People can get started on their own, but then we're consulted at a more advanced, more difficult point in the search."

Similarly, Computing Services' focus has been not only in developing new technologies, but also in making them more accessible for users, Levine said. Computing and library experts at Dartmouth have collaborated on various projects since the late 1960s, most recently



The card catalogs in Baker Library carry a reminder that they haven't been updated in more than six years.

with the creation in 1989 of a joint venture, the Information Systems group, whose director, Robert Brentrup, created DCIS. He reports to both Otto and Levine.

The Information Systems team developed applications to allow for the on-line viewing of the Library's card catalog system, as well as a wide range of information resources such as encyclopaedias, dictionaries, scholarly journals, and more.

"A library is no longer just a physical location for the active storage of printed objects. It's also a gateway with intelligent guides, a jumping-off point into the realm of digital information," Levine said. "Increasingly, the library is out there, on your screen, on the network."

So it was only natural that when

plans were floated for a new library, technology needs would emerge as a primary concern.

"Baker/Berry will remain a humanities, social-science driven library, but it will also be an information center for the entire campus," Levine said. "The new library is being driven by advances in technology, which allows people to both generate and access tremendous quantities of information."

At the same time, users will continue to need access to all sorts of information, including the kind contained in books.

"We're at a historical turning point where we don't know how (these changes) will turn out," Otto said.

"People ask why we need a new library at all, when everything will

eventually be electronic. But that's simply not going to happen right away. We need to allow for both streams, the traditional and the technologically supported. One is not more important than the other. But combining them makes a great deal of sense."

For additional information, see the Library Web site:
<http://www.dartmouth.edu/~library/>

The Computing Services Web site:
<http://www.dartmouth.edu/comp/>

The Information Systems Web site:
<http://www.dartmouth.edu/~library/infosys/>

Careful, Considered Planning Keeps Berry Process on Track

When the Task Force on the Library of the 21st Century released its report in May 1995, work on the Berry Library was only just beginning.

The baton was then passed from the Task Force to the Library Building Committee, chaired by John Crane, the Library's director of administrative services, and composed of many Task Force veterans. That group was charged with translating the programmatic vision of Berry Library into concrete plans.

Design work on the project commenced in January 1996, and proceeded in a number of discrete phases, Crane said. The object was to nail down approvals and consensus at several points so that problems identified late in the process didn't threaten the progress made to that point.

The first step was program development, to take the project as outlined in the task force report and translate it into a series of functional spaces. That concluded in October 1996 with the creation of a document that listed all program elements for the combined Berry/Baker project and their rough space requirements.

That document, called "A Building Program for the Berry and Baker Libraries," included ideal space requirements for a range of library elements and services shoehorned into Baker – acquisition services, circulation and reference staff, new stack space, and preservation services. It also included space for the Academic Computing division of Computing Services, based in Kiewit, and the offices of the Information Systems group, currently located in both Kiewit and Baker. It did not assign specific locations to any element.

Next came the site accommodation phase. Now that the architects had an idea of what was required of the new structure, in terms of space and function, it was time to examine building sites to see how Berry might fit with Baker, and with the rest of the campus.

During that phase, which concluded in January 1997, the footprint of Berry Library was placed on the maps to the north of Baker, to form the anchor for the new Berry Row, extending northward to the new psychology building now under construction near Maynard Street. However, that ideal footprint overlapped the Kiewit building, and would require the eventual removal not only of Kiewit, but of Bradley and Gerry as well.

That triggered new discussion about where to locate the services contained in Kiewit, should Kiewit be demolished. These services included the data network headends, the central Machine Room, the staff of Technical Services, and the Computing Services headquarters and administrative support staff, along with services such as the print window.

That's where the value of the Task Force report and a segmented approach to managing the project became evident, Crane said. Within the priorities described by the original report, it was possible to reach an agreement on what elements of Computing Services would be included in the building program without derailing all of the work that had been done up to that point.

"That was a nerve-wracking time," Associate Provost Margaret Dyer-Chamberlain said. "The potential removal of the Kiewit building

changed a whole set of assumptions about computing. Our Berry plans all worked when Kiewit was next door. Now what?"

The building program, then, was changed in February to include space for Technical Services and the network headends, Computing Services headquarters and User Communications, as well as the cable television network headend and the video production division of Instructional Services.

The schematic design phase came next. In concert with the architects from Shepley Bulfinch, a series of working groups started arranging different program elements inside both the existing sections of Baker (to be renovated as part of the project) and the new Berry space.

The object in this phase was to arrange the known elements within the known footprint so that the functional adjacencies described in the Task Force report could be fully realized. As that aspect came into focus, Crane said it became also easier to anticipate how users would experience the library as a whole.

That section of the plan concluded in June, and segued right into the design development phase that continues right up until the January 1998 deadlines for printing this publication. The design development phase extended the schematic design work into ever-increasing detail, down to the placement of individual workstations and pieces of furniture.

At the same time, consultants have been working on construction plans and cost estimates with an eye toward starting construction on Berry this spring, by relocating utilities buried beneath Elm Street. The process of actually creating the



The central corridor in Baker Library will remain the primary east-west passage at the heart of the campus.

working plans for construction of Berry Library will extend right up until the spring.

When the ground thaws out, the four-year construction and renovation phase begins. Buildings near the Berry work site — Kiewit, Bradley, and Gerry, as well as sections of Baker — will be structurally reinforced. Utilities buried under Elm Street will be relocated, and excavation for Berry itself will get under way.

By the fall of this year, work will be winding down on the Rauner Special Collections Library (in the former Webster Hall). When Rauner becomes available, a huge amount of Special Collection's material currently contained in Baker can then be moved out, making available some

much-needed elbow room for the work of connecting Berry and Baker.

The construction proceeds in two phases through the summer of 2001: Phase 1 is the building of Berry Library and its connection to Baker via the 1941 Annex on the north side. That work is scheduled for completion in the summer of 2000, at which time some parts of Computing Services — the network headends and their staff from Technical Services and Instructional Services — will move into Berry's lowest levels.

All other Computing Services staff currently located in Kiewit — in particular, Academic Computing — will move next door to temporary quarters in Gerry, and Kiewit will then be demolished.

Phase 2 includes the construction of the as-yet-unnamed academic wing on the west end of Berry, which will contain offices for the History Department, and classroom space. This phase also includes renovations to interior spaces in Baker. When completed in December 2001, library and computing staff will be able to move into all sections of Berry and into renovated quarters in Baker — at which point, the real work of realizing Berry's opportunities will begin.

Updates on the Berry/Baker building project are available at:
<http://www.dartmouth.edu/~library/BerryBaker/>

Faculty, Student Services Centered on Berry's Level One

For many years, faculty and students looking for information, or help finding that information, had to acquire some expert knowledge on their own.

Need sources for a research project? You might go to Baker or another library or campus for the books, or search the *Online Library* or *DCIS Navigator*. Multimedia resources might be located in North Fairbanks Hall, or somewhere on the computer networks.

Need to put it all together for a course that you're teaching, or to fulfill a class assignment? Reference librarians might help with the printed or electronic materials. Instructional Services might help with video and classroom support. Curricular Computing might help with programming for the Web.

All that begins to change with the advent of the new library. At the heart of the new library, located at the geographical center of the campus, is a central place to acquire information of all types. If it isn't stored, retrieved, or manipulated in Berry, someone can tell you where to go to get the expert help you need.

The resources may vary depending on whether you are faculty or student, but the idea is the same: if you need information or help in working with it once you've found it, Berry Library's Level One is the place to start.

Services for Faculty

The focus of Level One will be the central information desks where queries can be triaged to one of several locations: the computing Help Desk, the reference librarians, or the faculty computing center.

If it isn't stored,
retrieved, or
manipulated in
Berry, someone
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expert help you
need.

The faculty center will be staffed by the two units of Academic Computing devoted to faculty support. Research Computing, formerly UNIX Computing, provides computing support for researchers. Curricular Computing provides support for development of curricular materials, especially Web sites.

The lines between the two groups are increasingly blurred, Academic Computing Director Malcolm Brown notes. Research Computing staff helps with developing curricular applications in the sciences, and curricular applications often run on equipment managed by the research group. "It all depends on where the expertise lies," Brown said.

"I think the element to watch will be the faculty computing center," said Brown. "It will be a facility tailored to the faculty's needs, with advanced equipment and support staff. Given the importance of technology in the library's services and proximity of the reference desk, it will be exciting to watch the librarian/computarian synergies grow over time."

"The librarians, with all their content expertise, have a major role to play here," he added.

The center's emphasis doesn't rest exclusively with fitting out high-end development spaces, although that is part of the plan. During a focus group session with faculty in the fall, nearly all of the time was spent talking about support, Brown said. "The support we offer to faculty, not the equipment, is the most important part of the process."

In that regard, the computing staff might learn from the librarians, who have an excellent reputation for user service. The skill of a reference librarian rests with his or her breadth of knowledge and ability to understand how information is organized, said Humanities and Social Sciences Librarian Bill Moran. Librarians are concerned with how scholarship is produced, organized, and disseminated, Moran said, so it's only natural that they become familiar with the new tools.

"When the Task Force began its work, from the Library's point of view, we saw a natural set of mutual interests," Moran said. "For example, electronic text — if that's where the attention of scholars is, then there will be a convergence with computing experts."

If faculty are already familiar with how to obtain services from the reference librarians, it will be easy for librarians or faculty (or both) to spontaneously interact with the computing staff. Both sides are beginning to brace for the expected surge in demand for services.

"It's not just moving in that will trigger the demand. The move will allow better integration of technology with the traditional academic



Technology will be an important part of the library experience for future generations of Dartmouth students.

needs of faculty,” said John Hawkins, Academic Computing’s associate director for curricular computing. “Being there on Level One will build that in. They can just step over and consult, or vice versa.”

There isn’t so much of an overlap between the roles of technology and reference experts so much as a complement, in Hawkins’ opinion — and he’s worked in both Kiewit and Baker. Moran uses the word synergy — “that’s general enough to cover it.”

“We sense that we’ll be working together in many different ways that will bring many benefits,” Moran said.

A recent collaborative effort is centered on Baker’s Map Room, a repository for thousands of geographic documents. Technology is

changing that field rapidly, as new types and formats of digitized information become available.

The challenge for researchers is how to access and manipulate that information to best advantage. Research Computing is working with the library staff to better disseminate some of the raw data available from public sources, such as the U.S. Geological Survey or the Census Bureau.

It’s a simple experiment, focused at its initial stage on simply making information available, said Gurcharan Khanna, Academic Computing’s associate director for research computing. But it may pave the way for more advanced methods of manipulating that information, in collaboration with librarians and researchers.

“(The librarians) need to be able

to cover the bases on resources. The researchers need to be able to do whatever they want. The UNIX experts have unique resources to make this all happen,” Moran said.

The Media Center

Part of what the Curricular Computing team does is prepare content for digital delivery, for example by digitizing video. As part of the Berry project, Instructional Services’ production team will move into offices near the faculty computing center — placing them closer to the hub of curricular service delivery and to content stored on Berry’s Level Two.

The Instructional Services media collection, made up of thousands of videos purchased over the years by

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Classrooms Will Meet Demands For Instructional Technology

Classrooms and instructional spaces in Berry Library are being designed with the future — and some recent lessons — in mind.

The new classrooms will be created in a variety of shapes and sizes in both the new library and the attached academic wing, as will four fully-equipped computer instructional centers and a series of refurbished meeting spaces for library and computing staff.

The classrooms vary from small seminar rooms to larger, 60- and 80-seat classrooms, and from meeting rooms for small groups to sophisticated computer labs outfitted with the latest computers and teaching technology.

The level of technology to be found in each room will vary as well, say project planners, from full-blown computer and media installations to rooms that are designed to have equipment rolled in and out quickly and easily.

In short, all the new instructional spaces will help guarantee access by faculty to well-equipped teaching facilities. As a result, planners expect to see more faculty begin to incorporate technology into their lectures and lesson plans.

“Faculty often wonder why they should develop a curriculum that depends on complex technology if they can’t be sure they’ll be able to get an appropriately-equipped classroom,” said Mark Vogel of Instructional Services. “Having additional classrooms in the library supports the general classroom mission across campus.”

That general classroom mission is a relatively recent one, having evolved during the past four years of work by a cross-departmental

Observers expect to see more faculty begin to incorporate technology into their lectures and lesson plans.

team known as the Subcommittee on Classrooms and its Classroom Working Group. Instructional Services Director Mike Beahan, who chairs the Working Group, said that classroom modernization hadn’t been on anyone’s radar for many years because classrooms weren’t the primary responsibility of any single group.

For example, Facilities Operations and Management was responsible for building maintenance, Instructional Services for audio-visual technology, and Facilities Planning with general design and planning. There was no central budget for classrooms, just as faculty demand for sophisticated classroom technologies was increasing.

The Subcommittee began with basic research, touring other schools and inviting in experts to help assess Dartmouth’s needs and plan for the future. Much of the group’s early work, including the term “smart classroom,” was based on models developed earlier by Dr. Dan Niemyer of the University of Colorado.

Soon, evaluation of classrooms

began to take on new importance, as faculty and support staff began to realize the importance of integrating sight lines, chalkboard space (the original interactive display), space for projection equipment, and lighting controls.

“Instead of just tossing up new lights and screens, we now needed to pay attention to two or three different mediums, like slides, video or computer displays, as well as a chalkboard,” Vogel said. “That requires other things, like better lighting or shades on windows.”

To get out of the blocks as quickly as possible, the Subcommittee focused its efforts on big renovation projects — installations in large lecture halls at Fairchild, Silsby, and Wilder. Technology, such as slide and video projection, computer display projection, and stereo audio playback were added within the architectural constraints of existing spaces.

The latest renovation and upgrade project, completed this fall in Rockefeller 1 and 2, was the first to add an integrated control system for the audio, visual, and lighting systems, Instructional Services Operations Director Andrew Faunce said. The level of retrofitting required to integrate the systems, including custom woodworking, concrete demolition, and installation of special air-handling systems, made the Rocky renovations the most ambitious classroom technology project to date.

Along with the new Moore Psychology Building, Berry Library is the first new construction project to add a significant number of centrally scheduled classrooms since the Subcommittee and Working Group began their work. The project

puts technology in classrooms of different sizes, including small seminar rooms, and allows classroom planning to start from scratch, taking into account factors such as room dimensions — ceiling height, for example, in order to allow effective placement of lighting and projection screen (or screens).

Faunce said the sole emphasis on economy of scale — maximizing return on investment by emphasizing

full media installations only in large classrooms and lecture halls — has given way to a matrix concept which allows for four different levels of technology to be installed as part of a renovation or new construction project. At one end is the “media ready classrooms” designed for easy setup and breakdown of portable equipment, to media-equipped and data/media equipped classrooms, to the full “smart” installation that now

includes integrated control systems for electronics and lighting.

Because the technology levels may be applied to classrooms and seminar rooms of any size, over time, all classroom spaces can become “smarter,” Faunce said. “We’re still attending to the larger (seat yields), but the smaller rooms are getting much more attention, and that’s a significant change,” he said.

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Instructional Centers: From Famine to Feast

After years of mediating overwhelming demand for Kiewit’s lone computer instructional center, Academic Computing Director Malcolm Brown is especially happy to see four instructional centers included in the Berry program.

“This will solve a huge problem for us,” Brown said. “This takes us right into the final frontier.”

Academic Computing’s Consulting and User Education group has used the Kiewit Instructional Center for years to teach minicourses on how to use personal computers — everything from system basics to word processing to advanced applications. Its 16 student workstations and one instructor workstation are equipped with dual Macintosh and Windows 95 machines, projection equipment, network connections, and blackboards.

However, until recently it’s been the only facility of its type on the campus — and it’s increasingly in demand for a range of other uses. For instance, faculty use the room to teach students how to use special-

ized applications for their courses, Brown said. The center is open nights and weekends for use as an open cluster for members of the Dartmouth community.

The instructional center has been oversubscribed for years, and Brown has been leading the charge to find space for another one. Three years after initiating the hunt, Brown and his colleagues finally found space for another instructional center at Building 37 at the far northern edge of campus.

While that ought to help satisfy demand for the immediate future, Brown said the Building 37 facility will “overflow almost immediately” when coupled with the demand for training administrative users on a range of major systems currently being deployed as part of the Student Information System project.

The Berry Library provides relief for these problems, with state-of-the-art computer instructional facilities located at the center of the campus. Unlike the Kiewit Instructional Center, which was shoehorned into the

basement, and the Building 37 Center, which occupies part of a former cafeteria, the Berry facilities are being designed for computer instruction from the ground up, with careful attention to sightlines, acoustics, and lighting.

“The Task Force report describes a technology laboratory where users can learn how to use these tools,” Brown said. “The instructional centers are a vital part of that plan. I expect that, even with these expanded facilities, the rooms will be in very high demand.”

Phyllis Jaynes, director of library user services, agrees. “We’ll have really good instructional centers, and we’ll do them right, to meet the need for additional technology training.”

With a total of 98 student workstations, the Berry centers will “allow user education on a scale we’ve never done before. It will let us leverage instructional technology into new areas, including administrative areas. This is a huge leap forward, with very few obstacles.”

From Many to Few: Streamlined Services Are Coming

The trend toward convergence is already being realized in Computing Services as end user services become increasingly streamlined, years ahead of any move into Berry Library.

Managers of the Help Desk, the Repair Shop, and the Computer Store started discussing ways to improve service quality in 1996. Coordination and communications among the three operations was becoming more difficult — each group advises users, but is located in different areas and reports to different leaders in Computing Services, said Randy Spydell, associate director of Academic Computing for consulting and user education.

Sometimes that advice wasn't consistent, and sometimes people were referred to someone in a distant part of Kiewit only to be referred back to where they came, Spydell said. It became obvious that these high-traffic contact points with the general public needed better management.

This fall, the first big change to shorten the loop was implemented: the intake and delivery point for all hardware repairs moved upstairs to an office next to the Help Desk, just inside Kiewit's front door. Also moved upstairs was the Hard Drive Clinic and two staff from the Repair Shop. No longer do people have to find their way through the halls and down the stairs lugging heavy equipment just to receive advice that might conflict with what they heard upstairs.

"People love it," Spydell said. "People tell us how great it is that they don't have to carry their gear so far."

This fall, the first big change to shorten the loop was implemented: the intake and delivery point for all hardware repairs moved upstairs to an office next to the Help Desk

That experience is leading to other collaborations and experiments, such as the "Up and Running" program, which offers software services for buyers of new computers — setting up the standard Dartmouth software package, or help transferring the contents of old hard drives.

Some streamlining of hardware and software sales is already under way, said Betsy McClain, director of fiscal and auxiliary services. Orders submitted via e-mail and delivered directly to offices on campus now account for more than 30 percent of all sales, and continued growth in this direction could allow the Store and its on-site inventory to be reduced in size. On-line ordering of computers and printers could become as easy as on-line ordering of paper clips.

"It could solve a lot of related problems," McClain said. The Store isn't supposed to offer advice to buyers, who are currently directed by the

Store down the hall and around a corner to the CRC to have detailed questions answered. And with trends in the personal computer business pointing toward ever-tighter operating margins, any option that offers a way to reduce overhead — and increase value to buyers — needs to be looked at, she said.

So why not include a sales station in the CRC? That way, as Spydell says, "buyers can contemplate and complete their purchase in the same place." There are still some rough edges to be worked out, McClain said, but those are being dealt with, in some cases as part of the planning for improving user services in Berry Library.

For instance, the CRC currently functions as a de facto student development lab, with scanners, a few high-powered workstations, and high-resolution printers. Berry Library plans call for a new student development center that can accommodate those needs, as well as separate space for the CRC, Spydell said.

The move toward an integrated CRC/Store function might happen well in advance of the Berry Library opening, McClain said, in order to correct customer service issues, as well as realize efficiencies that might bring better prices and values to customers.

A current example of 'test driving' proposed service integration before the Berry Library opening is the move of the Repair Counter next to the Help Desk. When the new library opens and the service components — such as the Repair Counter — move in, the separation of the Counter and

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Level One: Berry's Centralized Focus

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Instructional Services, will be assimilated into the Jones Multimedia Center, whose name reflects the rapid changes the project has to contend with.

The original Berry plan included space for the microtext center, currently squirreled away in one of Baker's basements. That space, first called the Jones Microtext Center, would contain specialized devices for accessing content on microfilm, microfiche, and similar formats.

The Library never had the mandate, money, or space to fully develop its non-microtext holdings, Moran said — the duty fell to Instructional Services, although the Library acquired significant pieces as the need arose.

As Computing Services considered the overall needs of the faculty in light of Kiewit's impending demolition, it seemed natural to move the media collection (and its staff) to the Library — and give the Library control over and access to a new type of media for its collection, Brown said. As the plans developed, the name of the facility changed to reflect the broader variety of materials that would be located there.

The move reflects the trend toward bringing information and services for faculty and students together in one central location, said Director of Library User Services Phyllis Jaynes: "I think the overall plan will enhance interactions between users and staff. No one will have to wonder where to go."

Services for Students

Resources for students are also concentrated on the first floor. On the

No one will have
to wonder where
to go.

computing side, a new student development laboratory is being created out of services that were once combined in the Computer Resource Center (CRC).

The development lab will contain equipment for digitizing audio and video, such as scanners, as well as high-quality color and black-and-white printers that can be used for special purposes, such as creating resumes. The lab will also contain several high-end workstations.

Those resources are currently available on a limited basis in the CRC, which is primarily a facility for evaluating hardware and software before making a purchase. The relationship between the CRC and the Computer Store is currently being examined (see related article), but one thing is clear: the CRC needs more space than it currently has, even if it doesn't play host to any student development functions.

Berry Library addresses those concerns, with space allocated for both the CRC and for the student development lab. The exact specification for the lab hasn't been settled yet, but is likely to evolve during the next four years, said Randy Spydell, Academic Computing's associate director for consulting and user education.

Some of the most valuable services for students aren't directly

related to computing, Librarian of the College Margaret Otto said. The 24-hour café and study area on the ground floor (outside the perimeter of the library's core) is intended to be a gathering point for people seeking a respite from the grind.

And there are many places throughout Berry and Baker where students can study, as an alternative to working in the residence halls, Otto said. There will be plenty of places for people to work by themselves, or in groups — in whatever way they prefer.

"The library isn't all about technology or books, but it includes lots of spaces for people to gather and learn," she said — no matter how they choose to do so.

Feedback Key To Classrooms

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Credit feedback from faculty for that shift in emphasis toward developing smaller classrooms. In addition, almost all faculty who participated in the focus group sessions asked for "smart" multimedia projection capabilities, as well as for expanses of blackboard.

Additionally, many faculty were interested in flexible seating arrangements that would allow classes to reconfigure as needed for in-class projects, and the flexibility to include new technologies, such as videoconferencing — all items that can be considered as the space is being built from scratch, instead of retrofitted in existing space.

Other Computing Divisions: Where Will They Be Located?

A number of other divisions of Computing Services will also be moving into Berry and Baker. Several parts of Computing Services weren't included in the plan for Berry Library, and their future is still under discussion.

Technical Services moves into space on the lower level of Berry, along with the campus data and video network headends and the Machine Room. The staff of Technical Services provide broad support for the campus information infrastructure: the central Machine Room with its racks of computers, the network machinery, and the technicians that maintain these services.

Technical Services also includes a team of programmers whose mission is to help make the networks easy to use. Their accomplishments include *BlitzMail*, the ubiquitous e-mail application for the Macintosh; *Fetch*, a file transfer utility that is one of the most popular shareware downloads on the Internet; and a range of other applications for network administration.

The Information Systems group, a joint venture of the Library and Computing Services, currently has staff offices in both Kiewit and Baker. The Berry plans call for consolidating the team in a single location, in renovated offices on the second floor of Baker.

The Computing Services headquarters will move into renovated space in another section of Baker's second floor. The headquarters staff includes Director of Computing Larry Levine, who will occupy an office that was used by former Dartmouth President John Kemeny, and the central business office staff, which provides fiscal and adminis-

The ideal situation for Computing Services would be to gather all of its units into only one other location besides the Library

trative services to all divisions of Computing Services.

The User Communications group, which includes the staff that produces this newsletter, will rejoin the headquarters group in Baker after several years' absence.

Administrative Computing, the Repair Shop, the Computer Store, and the operations section of Instructional Services will have to be housed elsewhere. The only problem is, there aren't many options, said Director of Computing Larry Levine.

For example, Administrative Computing is located in Raven House, a former hospital building at the north end of campus. That building is slated to become space for academic offices at some point in the future. And looking further, Raven will eventually be demolished to clear a site for a much larger building to bookend Moore Hall, the Psychology Department structure that's currently under construction next door.

The functions and operations of the Shop and Store, currently located in Kiewit, are still evolving, Levine

said. That might create some options that would make an eventual move easier. For example, Store functions might be handled in the Computer Resource Center, which is destined for Berry, and some handled on-line, with order fulfillment and other back-end functions taking place at a remote location.

Berry also includes plans for a Repair Counter, where broken computer equipment can be dropped off and picked up. Levine said that would create a separate Repair Shop operating unit that could also be moved to a location away from central campus.

With the Instructional Services' video production unit headed for the library, the Operations division, which handles maintenance and operation of classroom audio-visual equipment, would be left in North Fairbanks Hall, along with its headquarters staff.

The ideal situation for Computing Services would be to gather all of its units into only one other location besides the Library, Levine said. North Fairbanks isn't large enough to accommodate Administrative Computing, or the Shop or Store — and it's increasingly viewed as prime space that's close to the center of campus.

That leaves Buildings 37 and 50 at the far northern end of campus — two structures that are occupied by Dartmouth-Hitchcock Medical Center staff and will need renovations after title to them reverts to the College sometime after the turn of the century. Planning is ongoing to determine when and if these parts of Computing Services will move into these buildings.



Students studying near the Orozco murals in Baker Library. The murals will be untouched by the construction.

User Services Converging Before the Move

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the Shop operations will have been rigorously tested. This separation provides a needed flexibility in options for relocating the Shop operations from Kiewit to a less centrally located point on campus.

The order fulfillment part of the Store's operations might also gain some practice operating apart from its retail front-end before the new library opens, she said. "Higher education discounts are under pressure, so why should we deliver the service if we can't deliver real value?"

McClain asks. "The whole notion of reselling needs to be reconsidered. You get a lot of benefits from standardization, for example, but we might be able to do that in other ways, without a Store counter, and then cut the overhead as well as the extra stop for the customer."

The focus on customer service motivates much of the discussion for the design of Berry's Level One. As computing user services are streamlined, supporting the needs of an increasingly technological reference library will be easier with all relevant services located at one

central point. If people need help locating an electronic resource, all of the people who can best answer that question will now be located in the same building.

"You can do it all in one place," said Humanities and Social Sciences Librarian William Moran. "It used to be that if you had a computer question, you walked to Kiewit, and if you had a books question, you went to Baker. That's what's being addressed with the convergence. Other schools have mandated the merger. Here, mutual interests are driving the process."

Looking Back at Kiewit: Building for an Uncertain Future

John Crane, the chair of the Library Building Committee, was a student at Dartmouth when the Kiewit Computation Center first opened in 1966.

In the middle of Kiewit's vast, unoccupied, and empty basement stood a lone PDP11 workstation, connected with a thick cable to a device in the Machine Room upstairs.

"It was really quite awesome," Crane said — and that was the way everyone thought of the building. Enabled by a \$500,000 gift from Peter Kiewit '22, and designed by the renowned modernist architectural firm of Skidmore, Owings and Merrill, the Kiewit building was a marvel that embodied the future.

Only one problem: the future of computing changed radically during the next 31 years. No one could have foreseen the scale of the shift from central to distributed computing, and the concurrent surge in demand for user services.

Despite valiant attempts to modify the building to address those needs, Kiewit was slated for demolition last year. The leaders of the Berry Library project have much to learn from the Kiewit experience.

"For me, it's the scariest part of building this library, because the crystal ball remains cloudy," Crane said. "We can't foresee what changes will be coming in the next 20 or 100 years."

The Task Force could anticipate that user needs would change and evolve. That's why flexibility became an important factor in Berry Library's design — an open floor plan would be able to handle nearly any eventuality in terms of changes in technology or staff organization.

By contrast, there were no models



The Kiewit Computation Center under construction, 1965. (Archive photo)

available when Kiewit was conceived. The architects knew they had to make arrangements to house a central computer with dimensions best measured with a yardstick. Computers required vast amounts of electricity and thick sheaves of cabling stuffed into special raised floors.

Kiewit's centerpiece, a GE-235 "medium-range computer," was smart enough to allow "virtually simultaneous use" by the two dozen input-output stations used to punch in requests. It needed a special

climate-controlled room, and the designers placed that room in the middle of the building, surrounded by offices for faculty and graduate students, a reference library, and lounges.

However, that design did not allow for much modification. The basic problem was the central Machine Room — its walls defined and limited the functionality of the building's interior spaces. So long as there was only a single computer and associated devices in the building, the design worked well.



Visitors on a tour of the Kiewit Terminal Room in 1968. That space is now occupied by the public cluster and CRC.

But technology was changing rapidly. The rise of the network and the distribution of computing power to user desktops brought a surge in demand for services that eclipsed the emphasis on central computers. The clear need was for more staff offices — and Kiewit had trouble adapting.

Spaces once allocated at reference libraries and lounges became offices and public computer clusters. The basement became offices for the Administrative Computing Group, until they outgrew that space and ended up, eventually, in Raven House. Programmers working for Technical Services have doubled up in basement offices, and the Repair Shop operation was worked on recently to meet OSHA workplace



Professors Thomas Kurtz and John Kemeny, 1964. (Archive photos)

safety requirements — all uses unanticipated in the original design.

Even the core Machine Room is being sacrificed to make room for staff offices, although it's getting tricky working around the requirements of the air conditioning system.

Berry Library places people at its center, instead of a Machine Room (which will be located in the building's lower level), and is being designed with options that will allow any configuration of books or technology in almost any location. The hope, Crane said, "is to create a structure for our successors that is still valuable and functional many years down the road, no matter what sorts of changes are in store."

By all indications, that challenge has been well met.



Students at work in Baker Library. Late-night study spaces are a part of the Berry Library plan.

Berry Continues Trends in Library Design

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during the design phase of the project.

The result: "We can zone the building by professionals and function rather than by organizational division," Wedge said. Dartmouth is unique in "pushing to get off the identity dime," and that ultimately benefits the users, she said. "The user services experts have been talking to each other for the last year. There's a real professional collaboration there, and people begin thinking you can go one step better," and that will continue to evolve.

For students or faculty seeking support in accessing or generating information, that means not worrying about what group may be able to help with one task, and then going to another building for help with another task. All information resources are increasingly available in one central location, Wedge said.

The integration of libraries and computing is still a relatively new phenomenon. "We know the direction that learning and the use of information technology is moving in. What we haven't seen are the real advantages of pulling it all together to the extent that it's being done here," Freeman said. "That's what ultimately distinguishes this project. The conversation is clearly now on the benefits of moving in together, and therefore describing that activity and helping it to evolve. It's an enormous step forward."

"The fun part in the building is that we really don't know what the result will be — we can anticipate the impact but we're not going to really know how great it's going to be in terms of the service provided until it actually happens," Freeman said.

But one trend is clear: earlier, modest experiments in library and technology integration have sparked

tremendous demand for new services. The huge popularity of USC's Leavey Library, for example, is now evidence that the school ought to go further in creating more of those kinds of spaces, Wedge said.

Emory University's new library took that integration concept a step further by adding a larger computing component, Freeman said, but the integration of library and computing staffs didn't go as far as it could.

Berry Library is the latest project in that continuum, and takes the integration concept to yet another level by placing even more emphasis on service and combining staffs with similar missions. "USC didn't bring all (of the computing experts in). Emory did bring them in, but didn't combine the staffs as much. But Dartmouth is putting (both computing and library staff) out front, and that will create a new identity over time with user focus."

What to Buy: Recommended Personal Computer Systems

Apple Macintosh personal computers dominate Dartmouth's computing environment. Support for Windows 95 computers is increasing. UNIX systems are also represented. If you're thinking about buying a new computer or software, this column outlines minimum recommendations for people buying new hardware and software.

Mac OS Hardware:

- Desktop System: Apple PowerMac G3/233 32/4.0* CD
- Laptop System: Apple PowerBook 1400cs/166 32/1.3* CD

*Indicates RAM in megabytes and hard-disk space in gigabytes. RAM can be upgraded in either system as necessary. Please contact the Computer Resource Center for more information.

Mac OS Supported Software:

- Word processing: *Microsoft Word*, *WordPerfect*
- Spreadsheet: *Microsoft Excel*
- Database manager: *Claris FileMaker Pro*
- Statistical analysis: *Microsoft Excel*, *SYSTAT*
- Basic graphics: *ClarisWorks*
- WWW authoring: *Claris Home Page*, *BEdit*
- Electronic mail: *BlitzMail*
- Dial-up software: *LinkUPPP!*, *Apple Remote Access*, *MacPPP* (Macintosh System 6 users only)
- DCIS access tools: *DCIS Navigator*, *Online Library*, *Netscape Navigator*
- Internet tools: *InterNews*, *Fetch*, *Netscape Navigator*
- Terminal emulation: *NCSA Telnet*, *DarTerminal*

Windows 95 Hardware:

- Desktop System: Dell OptiPlex 5200/GsMN MMX 32/2.0* CD
- Laptop System: Dell Inspiron 3000 M166ST 32/2.1* CD

*Indicates RAM in megabytes and hard-disk space in gigabytes. RAM can be upgraded in either system as necessary. Other configurations are available. Please contact the Computer Resource Center for more information.

Software for Windows 95 (Limited Support):

- Operating system: *Microsoft Windows 95*
- Word processing: *Microsoft Word*
- Spreadsheet: *Microsoft Excel*
- Database manager: *Claris FileMaker Pro*
- Statistical analysis: *Microsoft Excel*
- Electronic mail: *BlitzMail*
- Dial-up software: *Win95 PPP*
- DCIS access tool: *Netscape Navigator*
- Internet tools: *Netscape Navigator*, *Rapid Filer*
- Terminal emulation: *Host Presenter*

UNIX Systems:

Our public UNIX machines run SGI's IRIX and IBM's AIX. We provide limited support on other versions of UNIX, including Linux. We also have software site licensing plans for SGI, IBM, and DEC which include the OS, compilers, and applications. **Note:** All software not available on all systems; some may require a fee. Contact Gurcharan Khanna at 646-1644 for more information.

Selected UNIX Software (Limited Support):

- Graphics: *Data Explorer*
- Mathematics: *Matlab*, *Maple*, *Mathematica*, *IMSL*
- Statistics: *SAS*, *SPSS*
- Compilers: *Java*, *C*, *C++*, *F77*, *F90*
- Word processing: *TeX/LaTeX*, *FrameMaker*
- Image processing: *Photoshop*, *IPW*, *pbmplus*
- WWW authoring: *CosmoCreate*, *CosmoCode*, *CosmoWorlds*

Up and Running Service Is Now Available

Computing Services' "Up and Running" program is designed to help people to begin using new computers and software as quickly and as easily as possible. This service, for both Macintosh OS and Dell Windows 95 computers, is available for a fee.

Up and Running services include: Installing the standard (core) Dartmouth software; installing updates to the operating system software; installing new or updated versions of standard productivity applications, such as *Microsoft Word*; physically setting up your computer in your office; and transferring files from an old computer to a new one.

This service is available for new machines purchased at the Computer Store, and to owners of older equipment.

To find out more about the Up and Running program, contact the Computer Store or send e-mail to **up-and-running (up-and-running@mac.dartmouth.edu)**.

Where to Get Computing Help

Computing Services

Help Desk: 646-2999

9 a.m. to 4 p.m., weekdays

Computer Resource Center:

646-2626

9 a.m. to 4 p.m., weekdays

Computer Store: 646-3249

9 a.m. to 4 p.m., weekdays

Repair Counter & Hard Drive Clinic:

646-3129

9 a.m. to 4 p.m., weekdays

Business Office: 646-2643

8 a.m. to 4 p.m., weekdays

Academic Computing: 646-1349

8:30 a.m. to 4:30 p.m., weekdays

Administrative Computing:

646-3601

8 a.m. to 4:30 p.m., weekdays

Located in Raven House

Instructional Services: 646-2216

8 a.m. to 4:30 p.m., weekdays

Located in North Fairbanks Hall

Machine Room: 646-2075

Staffed 24 hours a day, every day

Research Computing: 646-1644

8:30 a.m. to 4:30 p.m., weekdays

Other Computing Resources

Computer Graphic Services:

650-1495

DHMC Computer Services:

650-2222

DMS Computing: 650-1394

Geography Dept. Rahr Lab:

646-3378

Humanities Computing: 646-2716

Language Resource Center:

646-2716

Library Computing Services:

646-3389

Mathematics/Computer Science:

646-2768 (Director of Computing)

Social Science Computing:

646-3947

Telephone Services: 646-2300

Thayer School Computing:

646-2807

Tuck School Computing:

646-1818

On-line Directory: A directory of Computing Services' staff and areas of expertise is available in two places: **(1)** on the World Wide Web at <http://www.dartmouth.edu/comp/directory.html>; and **(2)** in the on-line archives of *Interface*, accessible via the Dartmouth College Information System. Use the *DCIS Navigator* program to locate *Interface* in the category of "Computing Services." Double-click on the icon for *Interface*. The *Navigator* will launch *Online Library*, the viewer program for the archives. Choose **Title** from the **Index** menu, and search for "help."

Network Access

Modem Speed **Number**

- Up to 14,400 bps (603) 643-6300
- 19,200 bps or higher (603) 643-0102

Interface

Computing Services

Dartmouth College

6028 Kiewit Computation Center

Hanover, New Hampshire 03755-3523

Non-Profit Organization U.S. POSTAGE PAID Permit Number 3 Hanover, NH 03755
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