

Departments, laboratories to prepare five-year reports

By Burt S. Kaliski

Departments, laboratories, and other operating areas of the Institute are preparing detailed reports of their present activities, specific plans for next year, and general goals for the following four years, according to Provost Francis E. Low.

The plans, called five-year reports, will provide "a detailed understanding of where each department thinks it's going," he said.

Two banks to install ATMs in Building 10

By Janice M. Eisen

BayBank Harvard Trust and the Shawmut Bank of Boston will install automatic teller machines (ATMs) opposite the MIT Cashier's Office in Building 10. The installation will begin as soon as the room has been renovated, according to Comptroller Philip J. Keohan.

The machines will be located in room 10-186, formerly the office of the Educational Council. The room will also hold some staff offices, and paychecks will be distributed there. The Institute hopes this will reduce congestion in the Cashier's Office, Keohan said.

BayBank proposed in January 1982 to install one or more ATMs in the Student Center basement. MIT rejected the proposal in June of that year because of concern about security.

Present plans attempt to avoid the security problem by limiting the machines' operation to the hours between 9 a.m. and 5 p.m., although Keohan said there

MIT requires activities to report their payrolls

By Burt S. Kaliski

The Institute is asking student organizations which pay students to report those payments, according to Stephen D. Immerman, assistant dean for student affairs.

The organizations operate under MIT's tax umbrella, exempting them from social security taxes and other fees. Their payrolls, Immerman said, are once legally MIT funds, and the Institute must report them.

"MIT should have been including information about income and expenses about student organizations" on Internal Revenue Service forms 990 and 990T, Immerman said. The forms are used by non-profit organizations. Allowing the Student Employment Office to maintain the payroll is the "most convenient" method to satisfy the federal requirement, he said.

Reporting of payroll "was overlooked by all parties," said Stephen J. Casarano Jr., director of internal audit. "We were delinquent in that respect."

Student organizations, he said, are coming on board, and we are helping them with their projects. We have a legal requirement and we can't not perform that legal requirement."

Casarano and Immerman both emphasize the emphasis on reporting payroll is not a result of the Institute waiving of a requirement that student organizations pay an employee benefit fee.

Dirley M. McBay, dean for student affairs, had mentioned

"Being MIT, we will always be surprised by exciting new possibilities . . . which were not available at the time of the plans," he said. Project Athena, for example, began after the School of Engineering started its planning process.

A five-year report is "not a rigid document which forces a specific future on us," Low said.

MIT will not make public any of the initial reports, as "they contain a fair amount of confi-

dential information," including salary information and assessments of programs, Low said. Priorities for each school, however, will be made public.

The reason the Institute is preparing the plans, Low said, "is not specifically the budget problem." MIT is in the second year of an \$11 million cut in its support budget.

Preparing the plans, instead, "is a valuable exercise for everybody to think through," he said.

The reports will be used to determine budget cuts, but "with difficulty," he said. The academic budget will probably remain approximately constant, but that is "in effect a cut."

The \$11 million budget cut has not affected the normal annual salary increases, Low said. Those increases more than offset the cut, and raise the real budget for the support areas.

(Please turn to page 7)

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Tech photo by David Green

Boston's first major snowstorm of the new year arrived last night, and forecasters predicted 6 to 12 inches would blanket the area by morning.

Researchers find gravitational lens

By Simson L. Garfinkel

Researchers at MIT, the California Institute of Technology (Caltech), and Princeton University have discovered a new gravitational lens in space.

The discovery was made by physicists Bernard F. Burke '50, Jacqueline N. Hewitt G, and Charles L. Bennett G of MIT, working with Charles R. Lawrence of MIT and Caltech, Donal P. Schneider and Maarten Schmidt of Caltech, and Edwin L. Turner '71 and James E. Gunn of Princeton.

Gravitational lenses are objects in space, such as black holes or galaxies, which bend light due to their huge masses (see box). While only five gravitational lenses have been found, they are of great significance to the astrophysical community.

Triple radio source MG2016+112, the lensing system discovered, appears to consist of two astronomical objects: a very distant quasar and a closer, but still very distant, galaxy which splits and bends the light emitted by the quasar.

The quasar has several unique properties. Among these are a very large redshift (an astronomical measure of distance), extremely narrow emission lines, and emissions in both the optical and radio spectra.

Discovery Unique

Also unique to MG2016+112 is the way in which it was discovered. All other known gravitational lensing systems were discovered accidentally. MG2016+112 was discovered after a careful, planned search of a thousand radio sources.

The researchers began with a survey of approximately one thousand quasar-like objects. They then selected radio sources which resembled lensing systems, then isolated the objects with optical counterparts. This lowered the number of sources to "40 or 50 possibles. Six of them looked really promising," said Burke.

The researchers then examined these remaining sources to determine whether two or more ob-

(Please turn to page 2)

Quasars are distant astronomical objects which radiate light in both the visible and radio spectra.

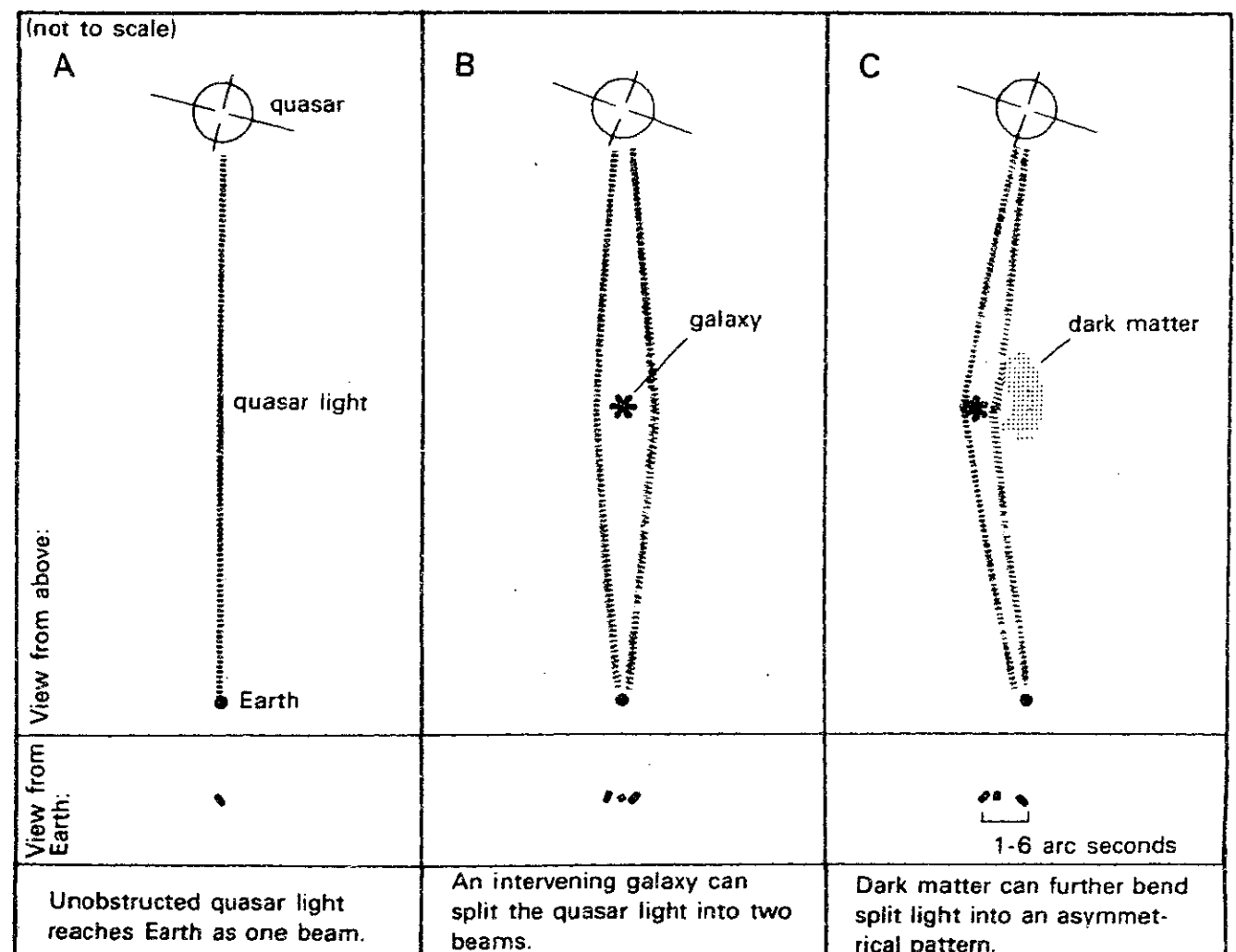
Normally, quasar light reaches Earth relatively unobstructed, as shown in A.

If a suitably large mass were between a quasar and the Earth, two images of the quasar would be seen, one on either side of the galaxy, as shown in B.

If there is more than one large gravitational mass in the vicinity of the lensing system, the bending will not be symmetric. In the case of MG2016+112, the gravitational lens recently discovered (see article), the bending pattern is asymmetric, but only one lensing galaxy is visible. The researchers suggest there is some dark matter, which emits no radiation and is thus invisible, near the galaxy, causing the additional bending (see C).

Simson L. Garfinkel

What the gravitational lens does:



Tech graphic by Simson L. Garfinkel

Unique gravitational lens found

(Continued from page 1)

jects in the source grouping had the same spectrum and thus the same composition. The theory is that if the light from one quasar is being split in two, then it will appear that two objects in a cluster have the same spectrum, indicating the presence of a gravitational lens.

From the spectrum, the redshift of the object can be determined. As light-emitting objects recede from the observer, the emitted light shifts to longer and longer wavelengths. This process is called redshift because blue light is shifted towards the longer red wavelengths. The amount of shift is proportional to the speed at which the object is receding.

Because the universe is expanding, the farther away an object is, the faster it is receding. If two objects in close proximity in space are observed to have the same spectrum and the same redshift, then astrophysicists assume they are two images of the same object. This splitting in two is evidence of the existence of a gravitational lens.

Spectrum Unique

One of the unique characteristics of MG2016+112 is the extreme narrowness of its spectral lines. The researchers, while calling the object a quasar, suggest

that it may represent a previously unknown class of astronomical objects.

In their report of the discovery in the January 6 issue of *Science* magazine, the researchers suggest that the gravitational lens may be magnifying the quasar's light in addition to bending it. According to the report, it is quite possible that the two quasar images in MG2016+112 would not be visible without the lensing caused by the associate galaxy. This would explain why this object is visible when other objects with such large red shifts are not visible.

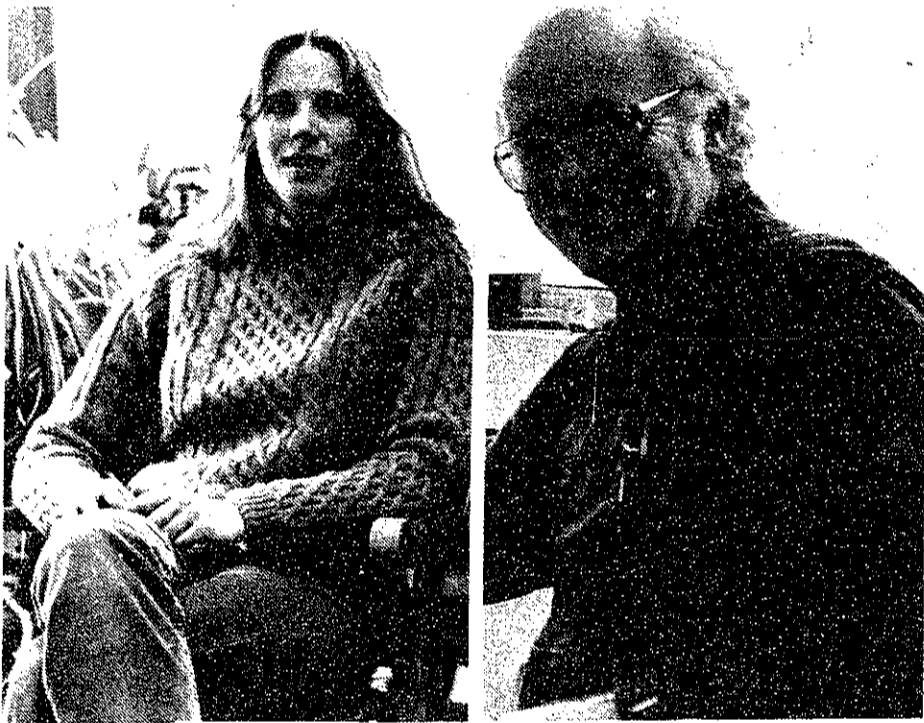
Models developed at Princeton University by Turner and Gunn indicate that between two and five quasars in every thousand will be lensed, and that the greatest number of lensed objects found will have redshifts between 1 and 2, Burke said. The models rely on basic assumptions about the amount and distribution of mass in the Universe which will be substantiated if the models are confirmed by observation.

Possible Applications

Astrophysicists expect gravitational lenses to be useful in their research. For example, the output from a quasar is not steady. Since the two paths of the split light from the quasar may not have the same length, variations in the

quasar's output may be observed at different times in the two images. This could make it possible to calculate the exact distance from Earth of a lensed quasar, said Burke.

Observations of the effects of lenses may also make possible better estimates of the age of the universe and of the amount of matter it contains.



Tech photo by Simson L. Garfinkel
Jacqueline N. Hewitt G (left) and Physics Professor Bernard F. Burke '50 (right) talk about the implications of the gravitational lens which they helped discover.

The Tech Publication Schedule for IAP '84

The remaining issues of IAP will be on the Wednesdays January 18, January 26, and February 1. Regular Tuesday-Friday publication will resume on February 7. The deadline for advertising during IAP is 5PM on Monday before each Wednesday issue.

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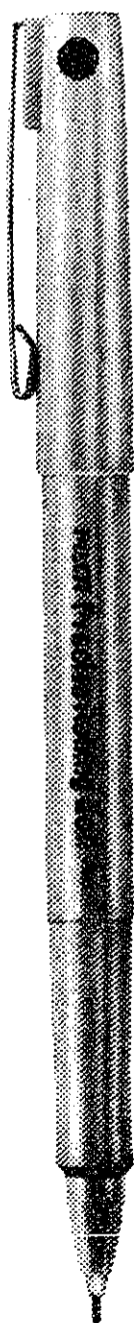
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news roundup

World

Lebanon fighting continues — The death toll among US servicemen in Lebanon rose to 259 last weekend as two Marines were killed by sniper fire. In a related story, Israeli Cabinet Secretary Dan Meridor said his government continues to insist that Syrian troops withdraw from Lebanon simultaneously with those of Israel, or Israeli forces will not pull out.

South Africa ends Angola invasion — South Africa began pulling its troops out of Angola Sunday, leaving the South-West Africa People's Organization (SWAPO) in disarray, with over 1000 of its members in flight northward. South African officials rejected Friday's UN Security Council resolution condemning the invasion.

Nation

Lavelle sentenced to prison — Rita Lavelle, former Environmental Protection Agency official, was sentenced Monday to six months in prison and a \$10,000 fine after her conviction for perjury, filing a false sworn statement, and obstructing a congressional investigation. Lavelle called her prosecution "an unbelievable nightmare" and said she will appeal her conviction.

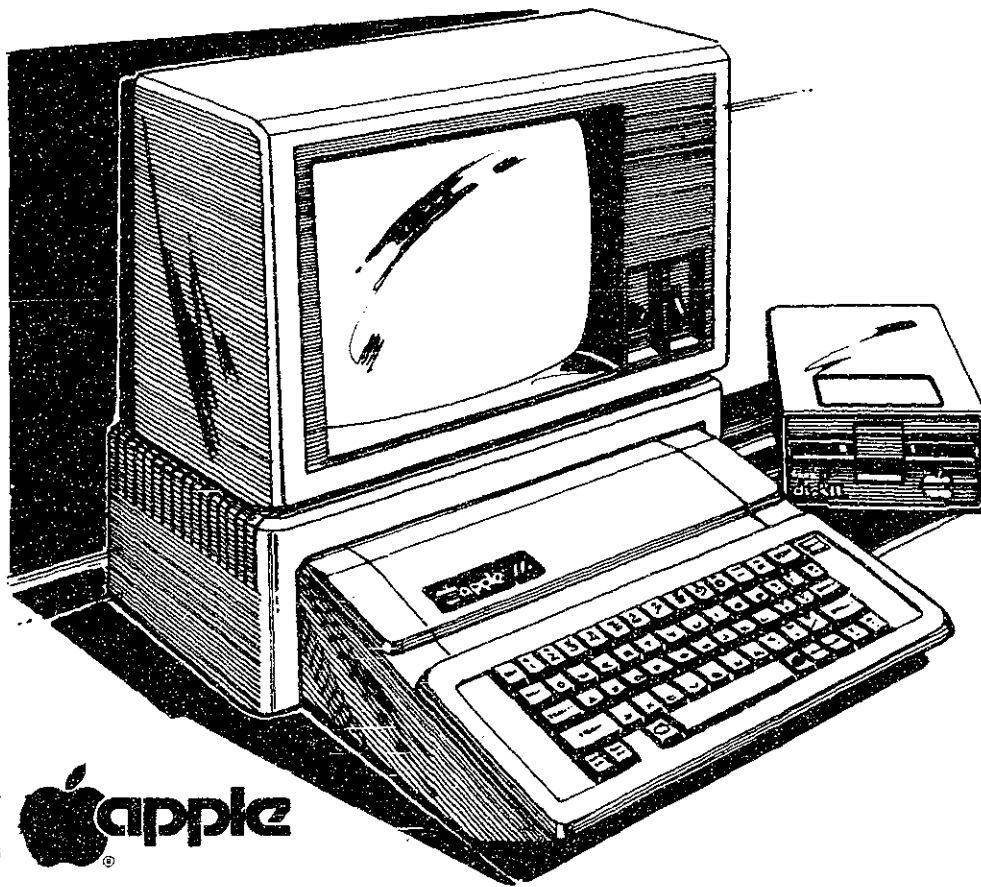
Texaco, Getty merge — Texaco Inc. announced Sunday the signing of a \$9.9 billion merger agreement with Getty Oil Co. If the merger survives a legal challenge threatened by Pennzoil Co., it will be the largest such deal in history. Pennzoil had announced an agreement last week to buy 43 percent of Getty Oil.

Sports

Caltech 1, UCLA-Illinois 0 — During the Rose Bowl football match between UCLA and the University of Illinois on Jan. 1 students from the California Institute of Technology (Caltech) used a remote-control device to alter the scoreboard so that the names of the competing teams read "Caltech" and "MIT." Unable to overpower the hackers' transmitter, officials were forced to shut down the scoreboard for the remainder of the game. (The final score was UCLA 45, Illinois 9.)

Janice M. Eisen

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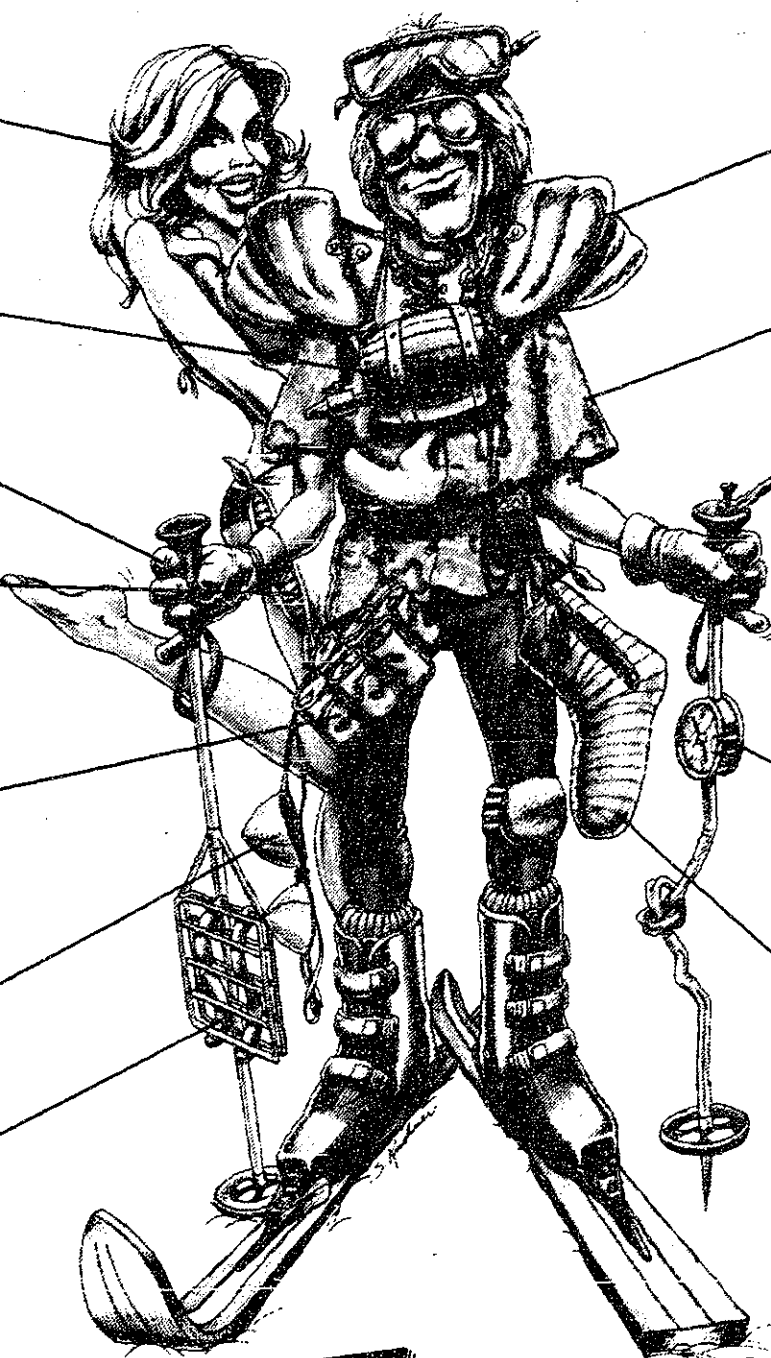
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Opinion

feedback

Grant recipients are not "beggars"

To the Editor:

Simson L. Garfinkel's column in the Dec. 2 edition of *The Tech* entitled "Do not price out excellence" was a very interesting piece. In it, he discussed a proposal for making it unnecessary for MIT to continue to charge the high tuition which it currently does.

While I do not disagree with his ideas, I do object strongly to some statements at the opening of the column. Their purpose may have been simply to put the reader in the author's frame of mind, in preparation for the rest of the article. However, I took them at face value and quite seriously. Specifically, I refer to one sentence: "Those who do qualify for loans or grants feel like beggars, and students on work-study are at a disadvantage because they can not devote as much time to their studies as their more affluent peers."

From Mr. Garfinkel's point of view, I must be a pretty miserable person. Why? Because I have experienced all three of these institutions — loans, grants, and work-study. From my point of view, I'm enjoying the MIT experience and have nothing but praise for the modes of financial aid which have allowed me to attend MIT.

My work-study experience in

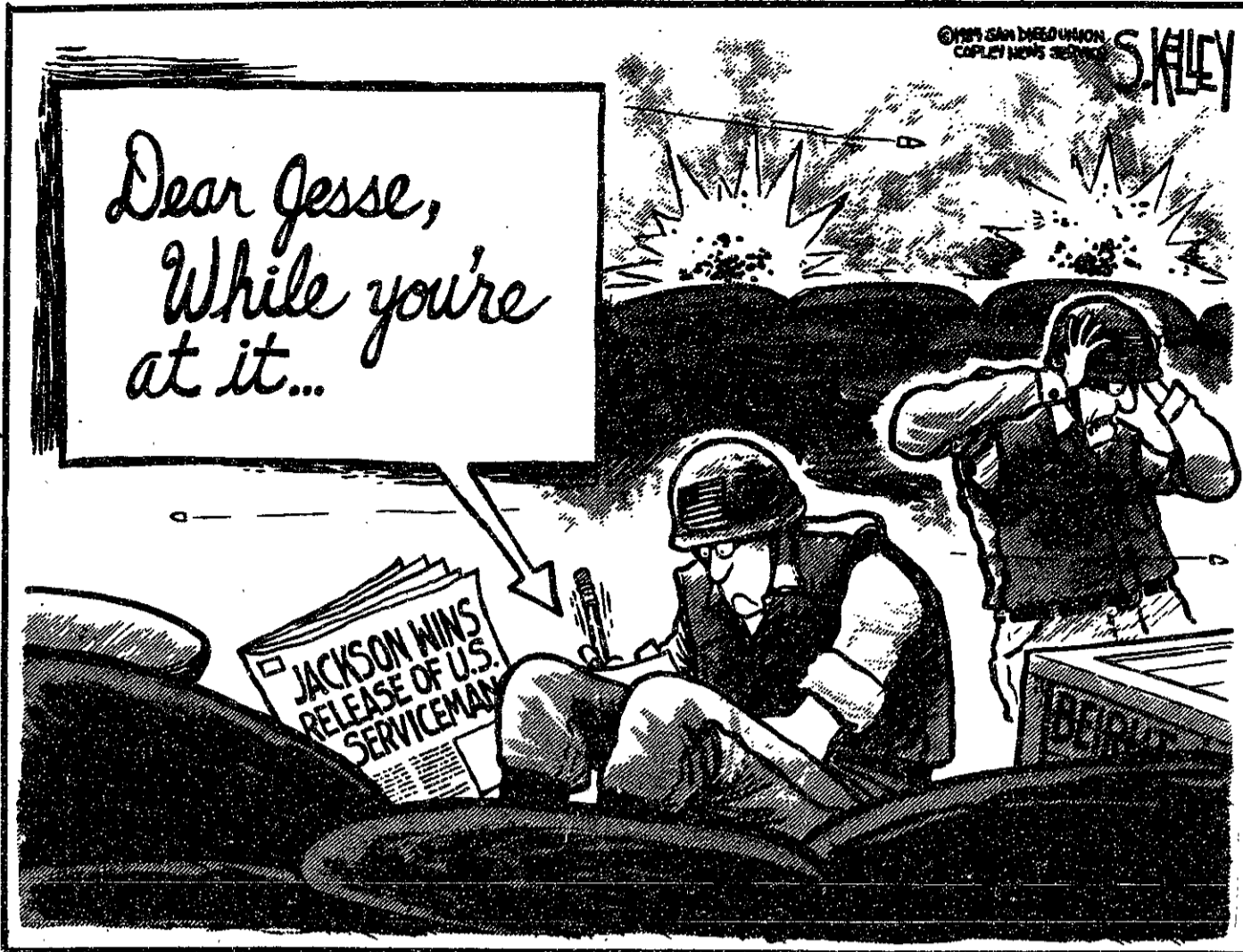
the library system afforded me an excellent opportunity to discover the research resources available at MIT. And, despite our "disadvantage," I know of no study which has shown that students on work-study suffer from lower GPA's than the other students at the Institute.

My loans have consisted of Guaranteed Student Loans from the Boston Five — a local Boston bank very willing to make educational loans. Sure they're making money and sure the loans have to be paid back, but they're helping to educate me. So how can I feel any animosity toward them?

Finally, I have received grants the last two years from MIT as part of my financial aid package. Since I'm from Texas, these grants have come from a scholarship fund endowed in 1960 by Eugene and Margaret McDermott (as in McDermott Court) to help out students from the Southwest in paying their costs at MIT. Mrs. McDermott still comes to Cambridge annually to visit with "her" students.

I hope, and I think the Financial Aid Office would also hope, that students like myself who must rely on grants and loans to get their college education don't "feel like beggars." I certainly don't.

John M. Osborn '85



feedback

Reflects on MIT admissions

To the Editor:

Every day I must walk up and down the infinite corridor ten times, weaving in and out of students, professors, secretaries and visitors from every corner of the world. I never get bored of watching them zoom by. No two MIT people are alike. The hall walls are also great to look at. What LSC movies will be playing, what parties are being put on, student reactions to political controversies, and activities in various clubs all decorate the wall like wallpaper. Last week, however, as I walked down the corridor for the second time that day I saw a sign above an office door that brought back immediate memories. That ominous sign that every student had at one point known well. The sign that said "Admissions Office" stopped me in my quick stride. I walked into the office and sat down casually watching prospective students.

I remembered how I labored countless hours to perfect my applications making sure that every side of my life was shown clearly and to my benefit. I remember putting on my finest clothing when I visited schools and trying to look good in front of anyone having anything to do with the school. Was it worth it? Well, yes I did get into MIT but now that I

look back I know it wasn't because I had a nice tie on.

Many high school seniors think that if they don't get into their first choice school, they'll be unhappy for the rest of their lives. What is this great decision based on anyway? What do these teenagers know about MIT or any college for that matter besides that it might have a good reputation, be in a nice location or that the food stinks? I chose MIT for a very different reason than what I am experiencing. What senior would ever think that MIT, "The Nerd School," would hold at least five parties every night every weekend of the year? How can a senior know what kind of lectures he likes if he doesn't even know what a lecture is? If I didn't get into MIT I would go somewhere else and learn all new things I didn't know about that school. Every school has its advantages and disadvantages. There is no perfect school for anyone. A school shapes to your needs and you shape to its needs.

I got up and left the office. I wished I could somehow tell those applicants to relax and take it as it comes, but I knew that the tension was inevitable. It is the first of many big transitions in a student's life. What more things were to come for me? In my next

transition, will I relax or will I go about it the same way as I did a high school senior? The situation won't be any different. There are so many things out there. How can I grab one and call it mine thinking nothing else will work for me? An open mind will make everything I do a success. The flow of people then grabbed me into its current as I proceeded to my next class.

Stephen Hoenig '87

Advertised "IAP" activities non-MIT

To the Editor:

Despite the use of the term "IAP," two programs advertised in the Dec. 6 issue of *The Tech* are not part of MIT's Independent Activities Period program, but rather programs run by outsiders (in one case, a commercial company, and in the other, an unknown individual).

Mary Z. Enterline

Manager

Independent Activities Period

Editor's note: The two non-MIT-sponsored activities were a speed-reading course and a project on acoustical analysis.

The Tech

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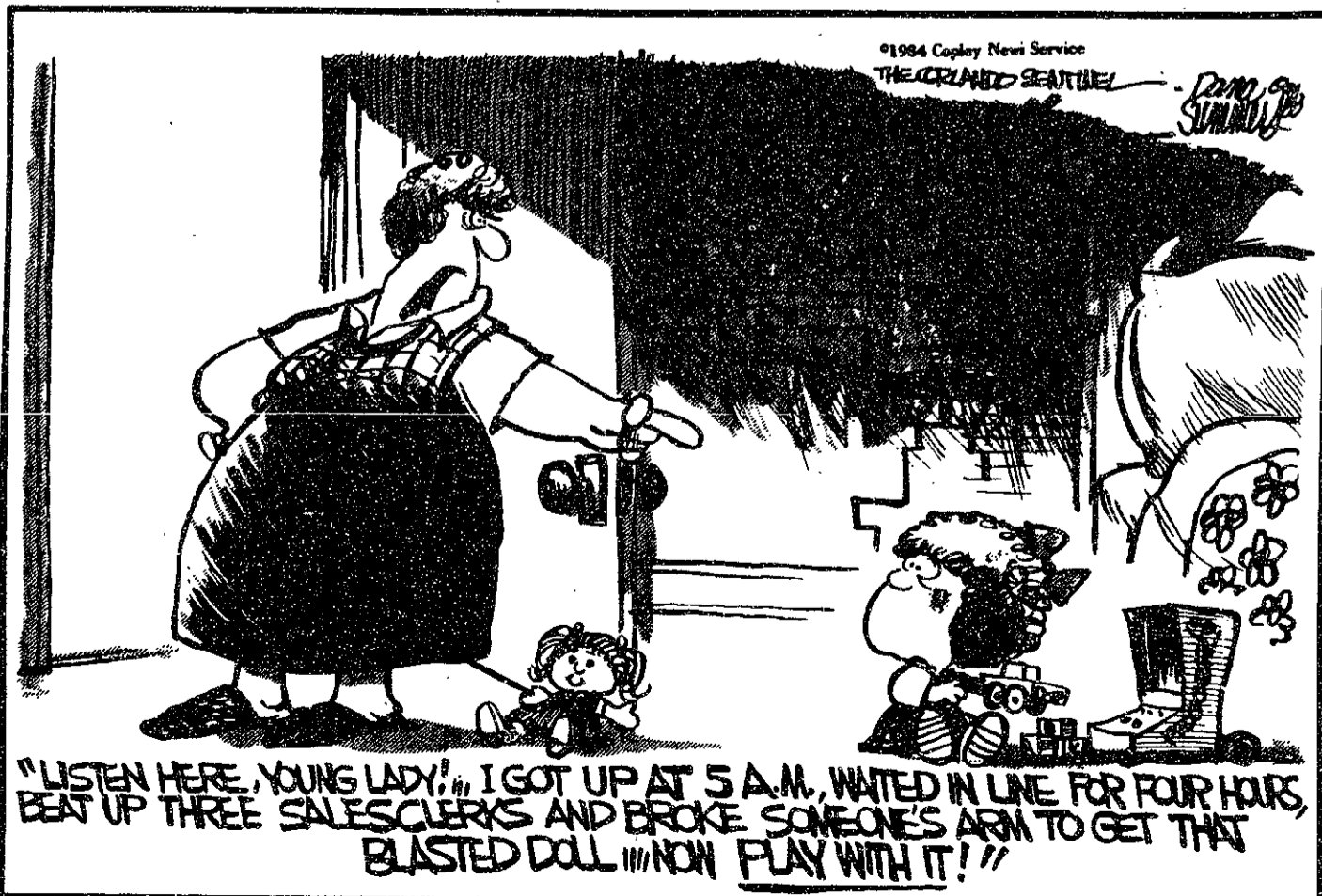
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feedback

Faults Garfinkel columns

To the Editor:

If it is your intent, I would like to thank *The Tech* for providing such great comedy in the form of recent articles by Mr. Simson L. Garfinkel. I fear, however, that Mr. Garfinkel actually believes the rhetoric he has produced of late. To remedy this situation, I suggest that, just once, he try thinking and writing at the same time.

In all fairness, Mr. Garfinkel's articles *have been* enlightening. Without them I would have never realized that by accepting financial aid, I am a begger — I thought I was just poor. He has also helped me gain insight into one of MIT's graduation requirements. After reading Mr. Garfinkel's articles in *The Tech*, I now

understand why the new Freshman Writing Requirement is so urgently necessary.

Mr. Garfinkel's series of articles on education at MIT (?) seems to be based on the premise that MIT, as it stands today, is grossly mismanaged, inefficient, and practically *deleterious* to an education. I quote,

MIT should be teaching its students three times faster than it currently is. MIT students should remember what they learn, in the smallest detail, forever. Accompanying these changes should be an increase in the amount of free, non-academic time, at the disposal of every student.

These three sentences are sufficiently ludicrous to make my point without further comment. I am, however, disheartened to learn that *The Tech* is so desperate for contributors, that anyone who is willing to sit at a typewriter twice a week is automatically elevated to the position of featured columnist.

As for Mr. Garfinkel, I can't help wondering why, if he has all the answers, he is at MIT now, instead of at his own school, learning the *right* way. Fear not, Americans, I'm sure another five-part series explaining this phenomenon will be forthcoming from you-know-who.

Mark E. Thurston '86

Marketing, teaching incompatible

To the Editor:

I marvel at the inconsistencies apparent in Simson L. Garfinkel's column in *The Tech* on Dec. 2. He calls for a "free academic environment" and yet dictates just what profit-oriented syllabus will be imposed upon the teachers of software subjects and what motives will be adopted by the faculties of the Sloan School and the Visual Language Workshop. He calls for the environment necessary to support "aggressive marketing" by MIT, but deplors "chaining" students and professors with "monetary pressures!" And he visualizes that the happy

result of this conversion of MIT to "Megatech Enterprises, Inc." will be a zero tuition rate forevermore. I have to ask, what aggressive marketer in his right mind is going to offer his principal product line (a superb educational opportunity, in this case) at no cost, just because (s)he has done well at selling a sideline?

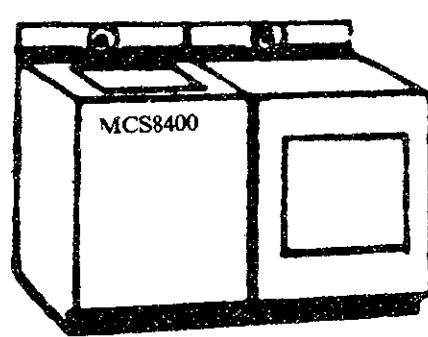
I offer the above remarks as an individual, personal response. The experience I have gained over seventeen years in MIT's aid office compels me also to comment that Garfinkel is way off base when he disparages the strong role that financial aid has played

in making possible the attendance at MIT of thousands of young people who have not "felt like beggars" — as he says they must.

Leonard V. Gallagher '54
Director

Student Financial Aid Office

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Two banks to install ATMs

(Continued from page 1)

to be a guinea pig." The only three area banks with remote ATMs are BayBank, Shawmut, and the Bank of Boston. The Bank of Boston studied MIT's proposal, then declined it, Keohan said.

Shawmut and BayBank will pay a small monthly fee to MIT to cover rental of the space and the cost of cooling required by the ATMs. They are also sharing in the cost of renovation. Each will pay \$19,000 toward an estimated cost of \$66,000, Keohan

said. He explained that the costs were divided according to how much of the renovation was needed for the ATM installation and how much for MIT's use.

MIT will not be earning money from the installation, Keohan said, but "we do consider it an enlargement of services for the community . . . and over the long run we hope it will relieve congestion across the hall." He emphasized that there will be no change in the services provided by the Cashier's Office. "They'll still cash personal checks. . . . We

want [the ATMs] to be a convenience for the whole community."

Negotiations with the banks began this summer. "We had hoped to be much further along with this," Lee said, "but the agreements took longer than anticipated" because of MIT's security concerns.

"Both Shawmut and Harvard Trust are very anxious to start," Keohan said. Renovation of the room has begun, and he expects construction to start "fairly soon." Neither he nor Lee could say when the machines will become operational.

Departments, labs will prepare 5-year reports

(Continued from page 1)

The Institute, meanwhile, is reducing support staff by not filling vacant positions.

Each department, laboratory, or operating area will report to its representative on the Academic Council, Low said. Members of academic and research areas will then report to Low, while representatives of finance, development and student affairs will report to Senior Vice President William R. Dickson '57.

A planning group, consisting of three deans and two vice presidents, meets weekly to organize the reports, Low said. The members do not serve in their official capacity, Low said.

The members are Dean of Engineering Gerald L. Wilson '61, Dean of Science John M. Deutch

'61, Dean of Architecture and Planning Jean P. de Monchaux, Vice President Constantine B. Simonides, and Dickson.

The Schools of Engineering and Science have submitted plans for two years now, while other areas began in the current academic year.

The Institute probably has not engaged in a similar planning process in the past, Low said. A lack of growth in research has forced the planning, he said.

"There is a general feeling . . . that the mode of free expression which we have had until the '80s . . . where every year research predictions expanded," Low said.

"We can't live that way any more. I think we are now in a period . . . where harder choices have to be made."

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notes

Listings

Student activities, administrative offices, academic departments, and other groups — both on and off the MIT campus — can list meetings, activities, and other announcements in *The Tech's* "Notes" section. Send items of interest (typed and double spaced) via Institute mail to "News Notes, *The Tech*, room W20-483," or via US mail to "News Notes, *The Tech*, PO Box 29, MIT Branch, Cambridge, MA 02139." Notes run on a space-available basis only; priority is given to official Institute announcements and MIT student activities. *The Tech* reserves the right to edit all listings, and makes no endorsement of groups or activities listed.

Saturday, Jan. 21

The Boston Business and Professional Women's Club presents **Point/Counterpoint: the Criminal Justice System** at the Westin Hotel at Copley Place. Author Shana Alexander will debate at

Announcements

February degree candidates who have student loans administered by MIT must schedule an exit interview with the Bursar's Office, Student Loan Department, room E19-225, x3-3341. The office is sending notices to those students about repayment status.

The Department of Civil Engineering will conduct a **UROF Traineeship Program** and will offer ten traineeships of \$600 each during the coming Spring Semester. For more information, call the Civil Engineering Undergrad Center at x3-8011 or Professor Hemond, x3-1637.

The Student Financial Aid Office alerts students to the \$1000 scholarship being offered by the **Huguenot Society of America**. The scholarship is offered annually to one student at MIT who is nominated by the Institute and is of verifiable Huguenot descent. For more information, contact the Student Financial Aid office.

NOTICE OF INTENTION TO ESTABLISH ADDITIONAL REMOTE SERVICE FACILITY

Notice is hereby given that the BayBank Harvard Trust, Cambridge, Middlesex, Massachusetts has filed with the Federal Deposit Insurance Corporation its letter-application to establish a remote service facility at 77 Massachusetts Ave., Cambridge, Middlesex, Massachusetts.

Any persons wishing to comment on this application may file his or her comments in writing with the regional director of the Federal Deposit Insurance Corporation at its regional office, 60 State Street, 17th Floor, Boston, Massachusetts 02109, before processing of the application has been completed. Processing will be completed no earlier than the 15th day following either the date of the last required publication or the date of receipt of the application by the FDIC, whichever is later. The period may be extended by the regional director for good cause. The nonconfidential portion of the application file is available for inspection within one day following the request for such file. It may be inspected in the Corporation's regional office during regular business hours. Photocopies of information in the nonconfidential portion of the application file will be made available upon request. A schedule of charges for such copies can be obtained from the regional office.

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By Michael D. Holmes, President

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