Two-time Nobel prize-winning chemist Dr. Linus Pauling delivers the annual Karl Taylor Compton Lecture, describing the life and work of fellow chemist Arthur A. Noyes. Pauling used the opportunity to stress the importance of nuclear energy in solving many of the world's problems.

By Bruce Kupfer

Last Wednesday night, Emmy winner Barbara Walters addressed the Harvard Law School Forum and the Harvard Business School Women's Student Association at Harvard Law School. Walters, who is famous for her interviews with distinguished personalities, recognized that while in her profession, her primary goal is to be as objective and as objective a questioner as possible.

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Walters reminisced on career.

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Dr. Linus Pauling, recipient of the 1954 Nobel Peace Prize, delivered the Carl Taylor Compton Lecture on the occasion of the 75th anniversary of the Laboratory of Physical Chemistry. The lecture was held on the occasion of the 75th anniversary of the Laboratory of Physical Chemistry. The lecture was held in honor of Arthur A. Noyes, founder of the Laboratory of Physical Chemistry and principal founder of the California Institute of Technology. In an anecdotal and often humorous style, Noyes described his personal and professional relationship with Noyes, saying that he would have liked to have been involved in the current trends in Physical Chemistry.

Followings, Ross, Albery introduced Dr. Linus Pauling, citing part of his educational background. Albery, a student of Pauling's, said that Pauling received his undergraduate training at MIT, and earned his Ph.D. in chemistry at the California Institute of Technology. He indicated that he was the only person in the room who had not been involved in the research.

Scholars and students from the MIT community will be the recipients of the Nobel Prize next semester. The present historic inadequate structure of the new station is designed to become a major transportation center serving Amtrak, subway trains, and Orange Line starting in 1983. Until then, Amtrak will continue to use the station. The project is part of Amtrak's $1.6 billion Northeast Corridor Improvement Program, which includes, by 1981, 120 mile-per-hour operation between Boston and Washington, and an additional electrification of lines from Boston to New York.

The Orange Line relocation along the corridor will include a station at Massachusetts Avenue, two blocks south of Symphony Hall, connecting with the Number 1 bus on Mass Ave.

Two calls had been routed to the United States. Later, after completing all the arrangements, she was euphoric that she would be on "the very first civil flight from Israel to Egypt since 1947." Walters was among a group of correspondents who awaited an historic comment from President Sadat's arrival. Instead Sadat remarked, "Very, Barbara, you made the plane." Then turning to Walter Cronkite, he said, "Walter, what do you think about Barbara being a woman?"

Constructions are presently under way adjacent to the Mass Pike between Back Bay Station and Washington Street.

The station modernization program, first conceived in 1965 and still under way, has made a significant impact on many of the worst stations in the system, according to John Williams and Jos Brown of the MBTA. Visible improvements have been made to upgrade fare control, color coding and other graphics, station identification such as by photo maps, rail names, the names of stations, and new cars on the Red and Green Lines. Future plans include platform extensions to allow six car trains, and new cars for the Blue Line.

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Rodman ignores smoking facts

By Gordon Hunter

The "attitudes and actions" of the MIT Medical Department Director show that "he approves of smoking," according to Gary Schultz, a staff member in the Laboratory for Nuclear Science, a charge which Medical Director Melvin Rodman "could not disagree with more."

Both Schultz and Rodman agree that many members of the Medical Department, including Rodman, smoke. Rodman insists that these doctors "who have the right to smoke around consenting adults in their own environment" that this is acceptable. Schultz maintains that "people who have the right to smoke around consenting adults in their own environment, but that of others, is as well. He added that "anyone who wants to work in health related fields should be prepared to give up smoking while on duty."

Rodman was the other hand, claims that "no one in any field should offend any one, white on duty," but that "on duty" meant only when dealing directly with patients or customers. "This is a no smoking office," stated Rodman, "the staff does not smoke in front of patients, except when the patient lights up or when consent is given. He added that "there may be as frequent exception to this rule as that because this department has no parking." Schultz pointed out that smoke could spread under doors, through walls and between windows, and that the smell can linger in a room or on clothing. He also said that there are many people who are sensitive to this smoke, especially in a medical environment. Thus, he concluded, a doctor shouldn't smoke in his office. Rodman says that the staff is hired by their qualifications, not by whether or not they smoke. He expects them to act with a sense of responsibility, which he calls "professionalism." This means that he expects them to try not to offend anyone and not to smoke in front of patients "because it is disgusting." However, he says that he can't expect to "prevent these professionals from indulging in their private offices." When asked about his own smoking, Rodman claimed that his "own behavior is irrelevant." "I am not smoking as an exemplar," he said, "I try not to smoke in situations where I would be taken as such." He added that "I don't want to play games either, parking as a non-smoker while smoking a cigarette to some chump." Rodman pointed out that he doesn't take his own advice on other matters besides smoking, saying he has often worked long hours and doesn't get enough sleep. He said that there is a difference between "public concern" and a private individual. "He has tried to quit several times, but it's tough to quit," "I don't know why I smoke," he continues, "except maybe I'm convinced I'm immortal, just as I often accuse others of believing." Rodman says he does not believe that this policy makes his own efforts or those of the Medical Department any less effective. That department has run a number of health education programs in recent years and Rodman himself is in a number of anti-smoking advertisements. Rodman states "we are firmly convinced that smoking is literally evil." He adds that "my judgment would be that we are doing a good job" in informing people about the dangers of smoking. When asked what he didn't like the message, he replied "The feeling was that pretty few people are in the news are not supposed to get that sort of money." Yet, "No one complains that Carson gets five million a year for work of a California-based religious cult, the People's Temple, in Guyana. According to the US State Department, the bodies of 400 of the cultists, who apparently committed mass suicide, have been discovered by Guyanese soldiers sent to rescue the rest of the Congressman's party. Survivors told the troops that the cult's leader, the Reverend Jim Jones, had ordered his 1200 followers to drink poison as part of a last consummation. So far Jenes and the other 800 cultists have not been found. Ryan visited Guyana in response to the pleas of the relatives of cult members who claimed that Jones was using mental and sexual intimidation to keep his followers. Ten members of his party are still missing and are presumed to be killed in the jungle.

Iranians released - As part of the effort to quiet opposition to his rule, Iranian Shah Mohammad Riza Pahlavi set free 210 political prisoners. During a speech in his Parliament and Cabinet at Tehran, he promised to hold free elections next June, which would end the military government he has installed in response to widespread rioting against his regime.

Maoo linked to "Gang of Four" - For the first time former Chinese Communist Party Chairman Mao Tse-tung has been accused of aiding the four radical party leaders known as the "Gang of Four," including his wife Chang Ching. This announcement in China was part of a continuing movement against the four extremists and their followers by reactionary groups, which began with rising in Peking and internal power struggles resulting in the disgrace of the "Gang of Four."

Middle East

Proposed Egyptian time table rejected by Begin - Israeli Prime Minister Menahem Begin has recommended to the Egyptian President that it veto a proposed Egyptian time table that would have linked the Israeli-Egyptian peace treaty to the solving of the Palestinian problem. The Israeli prime minister said that he had been asked to consider the treaty preamble which includes a more loosely defined link to the Palestinian problem. The Cabinet will not announce its decision until next Tuesday. Begin's timetable was showered with eggs on his way to the Cabinet meeting, by demonstrators calling for his resignation.

Jordana Holland

news roundup

World

Congressman killed in Guyana, mass suicide follows - Representative Leo Ryan (D-Calif.) and four members of his party were shot Sunday afternoon after visiting the headquarters of a California-based religious cult, the People's Temple, in Guyana. According to the US State Department, the bodies of 400 of the cultists, who apparently committed mass suicide, have been discovered by Guyanese soldiers sent to rescue the rest of the Congressman's party. Survivors told the troops that the cult's leader, the Reverend Jim Jones, had ordered his 1200 followers to drink poison as part of a last consummation. So far Jenes and the other 800 cultists have not been found. Ryan visited Guyana in response to the pleas of the relatives of cult members who claimed that Jones was using mental and sexual intimidation to keep his followers. Ten members of his party are still missing and are presumed to be killed in the jungle.

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Press leads science onto international stage

By Bob Wasserman

Science and Technology have moved out of the laboratory and have become major players in our day-to-day lives. The American scientific community and the global community are increasingly aware of the American scientific community and the global community. The Soviet Union puts technological exchange as one of the primary areas in which it will try to beat the Americans.

Press has focused on broader areas such as the biosciences, and American space program and beat the Russians to the moon. Under Press, formerly head of MIT's Earth and Planetary Science Department, has been involved in international scientific affairs throughout his career. He has helped organize the International Geophysical Year, which had closed the country to Western science for the past decade. Failing attempts by the Soviets and the Russians have cooled considerably. This summer's trial of Soviet dissident Anatoly Shemyakin, a Jewish computer scientist, immediately drew protests from US scientists. Scientists are wary between the Soviet and American scientific, which some critics claim benefit only the Russians anyway, were known to be involved in the production of biological weapons to the US.SR. were halted.

The involvement of the international scientific community in world affairs has increased greatly in the 1970's. International conferences, new scientific exchanges, and a greater circulation of foreign research journals have brought the world's scientists closer - both ethically and intellectually. The people form only part of their countries' societies, of course, but increased international travel and scientific exchanges of different nations makes the researcher less antagonistic and more apt to tolerating differences.

Press' emphasis as science advisor also marks a profound change in MIT's role. MIT is known for its technical excellence, but the global-mindedness of Dr. Press, US science policy will set the agenda for many international happenings.

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The Soviet Union puts technological exchange as one of the primary areas in which it will try to beat the Americans.
By Kenneth Burke

In the past few years, the Nestle Co., Abbott, Ben福利-Meyers, and other large multinational companies that produce infant formulas have begun to market these products to mothers in Third World nations. In radio advertisements and on billboards they promote the use of artificial formulas as the modern way to feed babies. They arrange for nurses to distribute free samples in clinics and hospitals, giving the impression that medical authority encourages bottle feeding.

This campaign has succeeded: many mothers who would otherwise have breast-fed their infants have chosen to bottle-feed instead. One result has been that the use of these modern, up-to-date techniques has helped to increase the number of infant deaths from infection and malnutrition in the developing nations. One specialist in pediatric nutrition, Dr. Derrick B. Jellife, has estimated that the promotion of artificial infant formulas has helped to cause 10 million cases of severe infant malnutrition and infection each year.

It may seem strange to Americans to think that the familiar baby bottle could have such disastrous effects. After all, it has worked well here and in other advanced nations for many years. Why shouldn't it work just as well in a poor country? There are several reasons.

First, artificial formulas are inherently inferior to breast milk. Breast milk contains antibodies to several disease-causing pathogens. The passive immunity conferred by these antibodies is an important protection for an infant, especially in a developing country where often sanitation is poor and water and soil contaminated. Although commercial formulas provide the nutrients that a baby needs, they have none of the antibodies present in breast milk and do not give any direct protection against infections.

Another important problem with bottle feeding in poor areas is the fact that the formula is so expensive and families so poor that they are often forced to dilute the formula to stretch it until they can afford to buy more. Since a mother who bottle-feeds even just part of the time gradually stops producing milk, the baby often ends up not getting enough food. A malnourished infant does not grow properly. Malnutrition retards a child's physical and mental growth, irreversibly in severe cases.

The use of formulas can also make a child more susceptible to infectious diseases. Instead of receiving sterile breast milk, the baby drinks formula that has been prepared by mixing a concentrate with water that may be contaminated by microorganisms. Many families can afford neither the equipment nor the fuel necessary to properly sterilize formula and bottles, nor can poor families afford refrigerators in which to store opened cans. Once the formula becomes contaminated, bacteria multiply rapidly in it. Even families who do have the resources to properly handle formulas will not know how to do it if illiteracy prevents them from reading the directions. Often the directions are printed in a foreign language.

Malnutrition and infection in infants are the two halves of a vicious cycle. Malnutrition weakens a child's resistance to disease. Infection increases a baby's nutritional needs and interferes with the absorption of the nutrients that the baby does get, weakening the malnutrition. A child can be trapped in this cycle, getting sicker and sicker until she dies. Bottle feeding in places where poverty is widespread and sanitation is inadequate exacerbates both halves of the cycle, poverty causing babies not to get enough food, contamination and lack of refrigeration making them sick.

In spite of the harm they are causing in children, the formula baby bottles are given by medical authorities to the parents. The latter is taken and buildings in which to work, certain needs like supplies, money for school is all about, and they have no more or less authority than the ministers. Administrators have study, and live. The latter is taken

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<td>2. Passive immunity conferred by these antibodies is an important protection for an infant.</td>
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<td>3. Artificial formulas do not provide the antibodies present in breast milk.</td>
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<td>4. Infants are more susceptible to infectious diseases when using formula.</td>
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A red-tape wrap-up

(Continued from page 4)

rather than further clarify the point. The point is that I see the administration dictating policy rather than serving the needs of the students and faculty. The students and faculty are what the school is all about, and they have certain needs like supplies, money and buildings in which to work, study and live. The latter is taken care of by the physical plant and the first two are taken care of by administrators. Administrators have no more or less authority than the feeding in the developing nations has caused 10 million cases of severe infant malnutrition and infection each year.

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Lord of the Rings: your favorite hobbits...

The most important part of the film is the characters. Unlike the Rankin-Bass Hobbit that appeared on television last year, Bakshi has attempted to remain faithful to Tolkien's description. The hobbits, Frodo (the nephew), Bilbo, Sam, Merry, and Pippin, are the small yet adult-looking characters that readers encountered in Tolkien's work. Complete with hairy toes, they act as one has come to expect, dedicated to enjoyment, but still brave and loyal.

The other races in the party are also well represented. Aragorn and Boromir, the two vastly different humans, are portrayed accurately. Boromir is the great warrior, full of heaviness and self-interest. Aragorn, the ranger, is more complex a character and never fully revealed. Gimli the dwarf and Legolas the elf are clearly presented as outstanding members of their respective races. Filling out the party is Gandalf, the powerful wizard who leads them through (Please turn to page 8).

Lord of the Rings is considered to be one of the major literary works of the twentieth century. In this film, Tolkien's trilogy is combined with the efforts of America's foremost talent in animation, Ralph Bakshi. Bakshi, whose earlier works include Fritz the Cat, Heavy Traffic, and Wizards, has introduced new techniques in Lord of the Rings that make it an awesome spectacle. Representing what is probably the state of the art in animation, this film allows you to forget it is animated.

As Bakshi himself admits, it is a film designed for those who have read Tolkien and who are familiar with the Middle Earth legend. Lord of the Rings is a story of the conflict between good and evil. It details the travels of Frodo, a hobbit, as he and the fellowship (a party consisting of elves, men, dwarves, hobbits, and a wizard) struggle across Middle Earth to destroy the ring of power that threatens to end everything and everyone good. The basic conflict is thus set and this film covers the first half of the epic description of their journey.

Part of the magic of Tolkien's prose that draws so many readers is its creation of a consistent, enchanting, complete world. Bakshi's film depends on the viewer having acquired much of this background before seeing the film. After an initial 15-minute exposition on the history of the Rings, the film takes off at a rapid pace. As a result, a viewer who is new to the story will find it difficult to follow. The film is a result in a film that is enjoyable for one who is familiar with the book, but confusing to one who is not.

The deadline date for submission of resumes for the M.I.T. Science and Engineering Resume Book, 1979, has been extended to November 21st. All interested students should bring resumes to the Career Planning and Placement Office, Room 10-170. Please note U.S. citizenship or permanent resident visa is required.

The Alumni Association wishes everyone a Happy Thanksgiving.
Lord of the Rings for Tolkien aficionados

(Continued from page 7)

The creatures encountered, orcs, a balrog, the ring-sprites, Treebeard the ent, and several others, are created in ways to accent their individual traits. The orcs are dark and indistinct while Treebeard is portrayed almost in the style of an old Saturday morning cartoon. In general, the forms of good are portrayed in detail and well illuminated while evil is dark and obscure. Some of the things people met in the course of the movie are disappointing.

The Lady Galadriel was not well depicted nor was Grima/Wormtongue, aide to Saruman, King of Rohan. Smeagol, or Gollum, is the one character with the greatest ambiguity. Never fully described by Tolkien, his appearance is open to speculation. Bakshi’s drawing of him is reasonable and depicts him somewhere between the more obvious forces of good and evil. Played for comic relief is parts of this segment of Lord of the Rings, he seems somewhat out of character, not quite in place in this film. Nevertheless, Gollum does evoke the sympathy from the audience that he does from the characters.

The backgrounds were also inconsistent. While excellent for the majority of the film, they suffer in many places. Rivendell and Lothlorien, centers of beauty, do not men- tionevery majesty Tolkien ascribes to them. However, for most of the film, the work is so real that it contributes to the suspension of disbelief that surprisingly pervades the whole film.

The music is the weakest part of the film. One or two segments are interesting, but Leonard Rosenman, whose credits include Academy Awards for Barry Lyndon and A Little Night Music, has failed to capture the atmosphere of Middle Earth. Tolkien’s world is a land rich with song, but not here, though the music is well illuminated while evil is dark and obscure. Forces of good are portrayed in detail and well illuminated while evil is dark and obscure. In the course of the movie are disappointments, the major majesty Tolkien ascribes to them. However, for most of the film, the work is so real that it contributes to the suspension of disbelief that surprisingly pervades the whole film.

The wizard Gandalf, one of the Nine Companions, direction of Bakshi, and cells with more simultaneous on-screen action and reality than any previous film is only one of the inno-vations Bakshi employed in this film. The battle of Helm’s Deep was not only the first part of this two-part film, but of the animation techniques as well.

The problems encountered while filming Lord of the Rings which are visible in the final product, serve to explain why this classic has remained unfinished for so long. After holding the rights for ten years, Disney gave them to United Artists in 1968. Unsuccessful attempts by Stanley Kubrick and John Boorman led the film to Bakshi who finally created a product attempt-ing to do justice to Tolkien.

When the film ends after the elmsitic battle at Helm’s Deep with the message, “Here concludes the first part of the history of the War of the Ring,” one is simultaneously disappointed and happy, leaving the theatre with a certain joy after having been transported to the world of Middle Earth, if only for two hours.

VLW begins fall lecture series

By Claudisa Perry

The Visible Language Workshop has reaffirmed its commitment to communica-tions by presenting a fall lecture series discussing various aspects of the media. The series opened with Topper Carew’s community involvement in television. At Rainbow, work was confined to MIT for the most part, he sees the need for openness up decision-making processes to the community. He is par-ticularly interested in two-way cable access as a method of making review processes more meaningful to the average viewer.
John Oliver: the Devil made him do it

By Joel West

Modern technology has brought a revolutionary change to the face of classical music. Due to the pervasive influence of recorded music, we have come to expect perfection in a recording, weak or inaccurate vocalists can be masked individually, mistakes can be excused with the stroke of a razor blade.

The MIT Choral Society's performance of The Spectre's Bride was by no means perfect, but most of its faults were those that could be easily removed by a clever recording engineer. Had the performance been given 50 years ago (hopefuly in a better hall than Kresge) it would have met with even more thunderous applause than it did Sunday.

Antonín Dvořák wrote The Spectre's Bride in 1884, the English version debuted in 1885 at the Birmingham Music Festival. The work directly evolved from the oratorios of Mendelssohn, Handel, and Bach; in fact, it shared the program at Birmingham with Elijah and the Messiah. The "Dramatic Cantata to a Poem," as it is described, was quite popular around the turn of the century, but has fallen into disfavor, unjustly so in light of Sunday's performance.

The symphony Dvořák commences the piece with an orchestral introduction. The winds paint a fairly typical pastoral scene; Dvořák's genius manifests itself by echoing the horn call on the C-string of the viola. This builds to a tempestuous ff, the whole section sets an appropriately melancholy mood for the cantata that follows.

After the chorus, narrator, and bridge quickly recoup events leading up to the present, Dvořák dramatizes his masterful ensemble writing in the first duet between the Spectre and his Bride. As throughout the evening, soprano Jeanette Hall-Wood and tenor Dean Shoff demonstrated a rapport befitting the couple and Dvořák's music.

Shoff would strike one as the bridgeburner-turned-fund, his main crime, his efforts to strip his bride of her Catholicism, must have been regarded as dastardly indeed by the deeply religious citizens of 19th-century Prague. Instead, Shoff came off as a gay nineties husband, cajoling, not insistent — a Benedict to his Beatrice. In recitative or arioso, the lyric tenor seemed well suited to the part and gave an undeniably fine performance: his tone was consistently clear and was the only soloist easily heard over the machinations of the orchestra.

Baritone David Arnold is a familiar face to Boston audiences, having made three appearances with the BSO. This reviewer heard his fine performance in (ironically enough) Beatrice and Benedict by Berlioz with the BSO last season, but his major deficiency both last season and this Sunday was a shyer lack of power. Arnold's task was not made easy by Dvořák, a composer not known for his vocal writing: his voice trapped in a maze of orchestral accompaniment, it became clear early on that he could not simultaneously articulate the words and make his voice heard while the orchestra was playing louder than mp. Oliver made the understandable choice of sacrificing Arnold's voice instead of the range of the orchestral dynamics, though inevitably the latter choice would still be the better thing this side of Symphony Hall, if only by a hair.

The enthusiastic concertgoer is fortunate to know music lovers across the country? Oliver has made quite a name for himself, both with the BSO Tanglewood Festival Chorus and on his own. The John Oliver Chorale has recorded on New World Records; perhaps Oliver could use his influence to get The Spectre's Bride recorded with New World, MIT Symphony's Vox/Turnabout, or even the BSO's exclusive agent, Deutsche Grammophon.

The sopranos in particular demonstrated their talents in their frequent solo entrances. The libretto revisions made by Oliver and Gertrude Hewitt corrected some awkward moments in the original translation; the revised version presented in Kresge was perfectly suited to the English language, more so than most pieces written for it. The enthusiastic concertgoer is tempted to speculate: could the Choral Society reassemble its forces at a later date, to record this unique English version for the benefit of music lovers across the country? Oliver has made quite a name for himself, both with the BSO Tanglewood Festival Chorus and on his own. The John Oliver Chorale has recorded on New World Records; perhaps Oliver could use his influence to get The Spectre's Bride recorded with New World, MIT Symphony's Vox/Turnabout, or even the BSO's exclusive agent, Deutsche Grammophon.

It's time to go home and explain to all your parents, siblings, grandparents, aunts, uncles, and other friends and relations just why you didn't have time to write. . . .

Why not save yourself the trouble and send them The Tech instead?
By Alan MacRobert
Editor's note: Alan MacRobert is a member of the Real Paper.

The controversy over Rev. Sun Myung Moon and the Unification Church will heat up in Boston in the next few days, when Moon's seventh international conference on the Unity of Sciences will be held at the Sheraton-Boston Hotel.

About 450 scientists, scholars, and theologians from more than 50 countries will attend the conference from Thursday through Sunday (Nov. 23-26). The theme will be "The Re-evaluation of Existing Values and the Search for Absolute Values."

Every year a debate takes place in the scientific community over whether to accept Moon's money and attend his conference. Many scientists have refused to participate, arguing that to do so lends Moon respectability. Others, often those who share Moon's anti-communist views, attend every year.

An ad hoc coalition of students from MIT and other schools, and families of Moonies, will be protesting the conference. On Wednesday the coalition will picket the State House from 11:30am to 3:30pm, while parents, students, and friends of Moonies hold a press conference inside. The picketers will then move to the convention site at the Sheraton Hotel in the Prudential Center. The group will also picket the Sheraton on Thursday from 4pm to 7:30pm, and Friday from 8:30am to 7:30pm.

Members of the group will attempt to give the scholars copies of a recent congressional report on Moon's worldwide business and political activities. The report describes Moon's science conferences as part of his "overall goal of controlling major institutions in the United States and other key nations and of influencing political decisions and policies." The report also says Moon's organizations have worked closely with the Korean CIA since the 1960's. Moon has said he wants to gain a foothold in the academic world because, while he has not control over two or three universities, then we will be on the way to controlling the rest of them for the selfish interests of the foundations in the United States."

"A number greater than zero and less than any positive fraction is called an infinitesimal," explained Riaz. "These, along with the infinite numbers and the set of real numbers, make up the system of surreal numbers."

Riaz first learned of surreal mathematics with the work of John Conway, the brilliant mathematician from the University of Cambridge who is best known for his accomplishments in the field of mathematical games. It was his work with these games, in fact, that led Conway to the derivation of the surreal number system.

Riaz explained Conway's work in terms of one of the most popular games that Conway uses, Heckenbush. In Heckenbush, the players are given a network of branches as shown in figure 1. The two players, left (L) and right (R), must, in turn, remove a branch with their label on it. They can remove an outside branch, or they can extend a new inside branch and remove everything that is attached above it. (Figures 1a and 1b show possible first moves for L.) The player who runs out of branches first, loses.

Conway's intentions, according to Riaz, were to develop a numerical system for predicting the outcome of the games. In other words, by analyzing the branches of a Heckenbush game, taking into account many complicated factors, Conway comes up with a number. This number tells him whether a player always wins, always loses, or always wins, or always starts losses.

For example, figures 2a and 2b represent two simple examples. The set equations on the right are Conway's surreal number system. They describe the branching network and indicate who will win (i.e. a positive number means L wins, a negative number means R wins).

As can be seen, the surreal numbers are derived from a set of numbers with left and right elements, and they yield numbers between the two values. (0) R is a simple example. It is normally more difficult to interpret these number sets, however, as can be seen by Riaz's explanation of why (0) R is in figure 2a. "Well, I is greater than 0 and less than any member of the null set, but there are no numbers in the null set so this system is vacuously satisfied."

The most important thing to understand about the surreal numbers is that they are derived from the rules and restrictions of the sets Conway uses to describe his games. Reducing as complicated a phenomenon as the surreal number system to a simpler system like Conway's set representations appeals to the beauty of its structure."

"The system is powerful and extremely interesting," Riaz concluded. "So many come of so little. You are basically building the surreal number system up from scratch."

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**Real Paper.**
Foot of the Charles

Photo essay by
Marvin Hom

Club football changes intramural picture

By Gordon R. Haff

The addition of Club Football to MIT’s collection of intercollegiate sports this year proved to be a great equalizer to the MIT intramural football program. With the football stars gone, many of them from just a few houses, the number of teams increased this year. The number of teams increased from last year’s two to this year’s many of them from just a few houses. There were entered from MIT, Northeastern, Tufts, Simmons, and around the Boston area. In all about 24-0. (Photo by Gordon R. Haff)

Last Saturday, Lambda Chi Alpha ran a football marathon for the benefit of Easter Seals. Twenty-one teams, of which about two thirds showed up, were entered from MIT, Northeastern, Tufts, Simmons, and around the Boston area. In all about $1500-2000 was raised for Easter Seals. The marathon was run on November 5 under sunny skies. Brian Reihold of Meteorology finished in the front of the 183 runners (151 male, 32 female) with a time of 12:40.

Ralph Braid of Economics came in second with a time of 12:47. In the team standings, which were figured on the basis of the times of the team’s top four runners, Kappa Sigma won the living group trophy and Sloan won the independent.

Scoreboard

Saturday
Women’s Fencing 10
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IM's need more referees

By Gordon R. Halff

The Intramural Council may have found one of the problems with managers this year, but these problems have not yet been equitably solved. In fact, istock.com lack of referees.

Many IM’s have never been a surplus of competent referees, especially for those sports like football and soccer whose games are cluttered into the daylight hours of the weekend instead of being scattered over evenings throughout the week. Indeed, about five years ago IM’s encountered problems similar to those being experienced this fall. At that time an incremental pay scale for referees was introduced, replacing the old fixed hourly rate, thus providing incentive for improvement. According to Dave Michaels, the IM supervisor, this helped alleviate the problem for a while.

In 1975, the Physical Education Department sponsored a refereeing course in all major sports. In all but one case, these courses were taught by students. Michaels said, "These were refresher courses and very helpful." He added that they were used to get graduates into getting those jobs but in terms of improving quality as well. According to some IM’s, the graduates together with Dave Michaels and Ed Crocker, director of the Physical Education, about 25 percent of the people who took the PE course were on to refer again.

Since the PE classes had large enrollments, this figure represents a sizable number of official’s. However, when the athletic budget suffered the cuts, these courses were one of the first things to go. Why so many referee problems cropped up this year? Michaels says there are many more reasons. The first is that the number of refs has always fluctuated on a year to year basis. The reason we are simply in a valley right now. His second reason is more interesting and worth delving into more deeply. He blames the coverage of sports on television and the way that it has affected the atmosphere of even casual play. Michaels said that in IM’s "anger gets taken out on the official" and that this problem has "definitely gotten worse." The situation is even more severe for the referees in particular. In fact, not competent, but Michaels said that he often sees referees who are willing to reff anything but "A" league. He does not see any solution to the problem. The IM council has written letters to a few "A" league teams, but these are barely paying their referees, and it is therefore right now that the basic problem is to have fun.

Since the IM council wants to keep the "A" and "B" league games competitive and want a fair game but the referees have a lot of work left that the major purpose is to have fun. Michaels doesn’t really see any to the referee abuse problems, since, for one thing, he’s "not sure the IM council wants to face up to this." In practical terms, Michaels "envisions a core of 50-70 referees, grad and undergrad, who should be trained through PE or Athletic Department courses."

Most of these referees would cover a variety of sports, as opposed to most of the referees presently around who do only one or two. Michaels said that the possibility of giving PE credit for refereeing has also been considered, although this has a variety of problems. According to Ed Crocker, this option will probably once again feature at least one PE course. In ref. The course or courses would probably concentrate on the sports which have had the greatest difficulty getting refs. It is of interest to note that basketball has regularly had a course in officiating over IAP and has had no serious problems with officials over the last few years. For that matter, this year 75 people turned out to the two official's clinic. The next meeting was a sort of "out- star" meeting. Crocker said that he felt one of the major problems with IM referees right now, in addition to not having enough of them, is that many don’t have enough background in officiating in general. As a result, he says "they tend to lose control a bit of the time."

Hopefully, the reinstatement of PE courses will rectify the serious problems encountered in football and soccer this year. At these shows, forced teams have to have higher leagues to contribute referees in the "B" division, but because more often than not, those officials who are only reffing because they have to are incompetent and unreliable. The courses have the added advantage of not only getting more referees but training referees. If needed, incentive to take these courses might be obtained by giving higher grades and organizations are en- couraged to enter teams. A brief sending meeting will be held at 8pm Monday, December 4, at Sigma Alpha Epsion, 444 Beacon Street, Boston. The Athletic Chairperson or a representative from each team is urged to attend this meeting. Rosters are due in the IM Wrestling office on the second floor of the building on or before December 11.

Sun - Sat 7 days until Jan 4 Brookline St. 355-8238 Central Square Cambridge

According to Dave Michaels, the IM supervisor, many qualified refs will officiate anything at all, but are willing to refere anything but "A" league games. In contact sports such as football and hockey, "A" league games can easily get out of hand. The situation is even worse when there is intense rivalry between the two teams as was the case in this Fiji/Baker-LCA championship game in conjunction with loud support from ringside makes assignments such as these difficult to do reasonably. (Photo by Gordon Halff)

Women’s fencers triumph

By Amelia Philips

On Saturday, November 18, while the rest of MIT was enjoying the unexpected sunshine and warmth, the Women’s Fencing Team was busy fighting its way to victory against the University of Connecticut. The final score was 6-1, in favor of MIT. Michelle Przybylski ’79, as always, came through with her slashing swords (swords). She boldly bid her time on each and picked her opponents apart. Deep into the action of the sec- ond round, Sayuri Kuo ’81 brought her defense, but deadly, attacks into play. These penetrating maneuvers brought her second bout quickly to an end with her the victor at 50. Junior Julia Shimaoka’s lightning fast fencer proved to be the undoing of several of her opponents. When not using that tactic, Julia moved swiftly in and out of the action of the se- cond round. Finally, Sayuri and Amelia Phillips ’81, each fencing one bout, Debly fought valiantly to the bitter end, but lost 5-4. Amelia went in eagerly, but bravely.

The weekend of December 1 and 2 marks the biggest event of the season, except for the New England finals, as the team packs up and bikes down to New York City to go against other teams.

The next event in this area will be Friday, December 8, at 7:30pm at Harvard Gym against Radcliff.