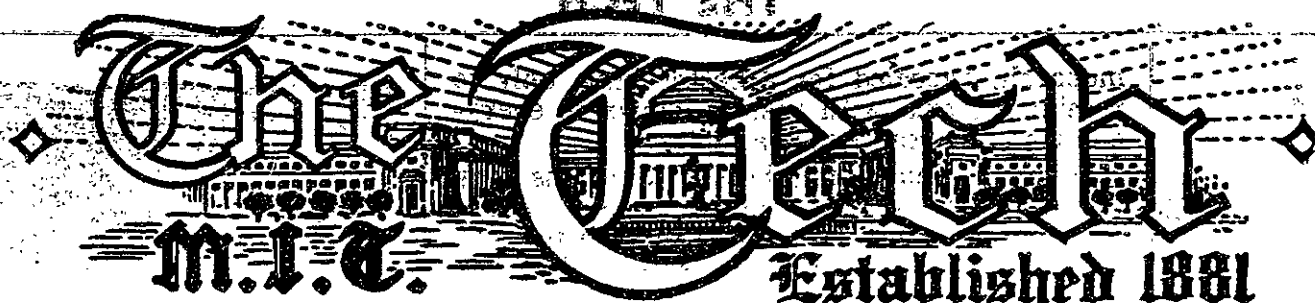


Official Undergraduate
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Massachusetts Institute
of Technology



A Record of
Continuous News Service
for over
Half a Century

Volume LIV. No. 51

CAMBRIDGE, MASS., TUESDAY, DECEMBER 11, 1934

Price Three Cents

PUCKSTERS FACE HARVARD TONIGHT AT BOSTON ARENA

Players Not Worried By Defeat At Hands of Princeton Last Saturday

CRIMSON WILL PLACE VETERAN TEAM ON ICE

Starting Goal Guard Uncertain As Don Kenny Is Again In Condition

Undismayed by their 7-1 defeat at the hands of the Princeton Tigers last Saturday, the Beaver puck chasers are well prepared to put up a real game against Harvard at the Boston Arena tonight. This will be the first and last chance to see M. I. T. in action locally until next January, as the only remaining game before vacation is against Brown at Providence this Friday.

The Princeton 7-1 defeat was not a surprise. Last year's Tech team, which was a very fine one, lost to the Tigers by five points. Although Tech was clearly outclassed, they managed to play Princeton about even after the first disastrous period, in which their opponents scored five of their seven points. In the second period, the Tigers added two goals, but were held scoreless in the third and final period in which Goodwin scored M. I. T.'s single tally.

The boys were a little nervous at the start, but soon settled down to
(Continued on Page 3)

BALLOONS RELEASED IN ST. LOUIS FOR METEOROLOGY STUDY

One Balloon Attains A Height Of 65,000 Feet; Found To Have Travelled 150 Miles

Within a period of less than three weeks since the release of 35 sounding balloons by meteorologists of the Institute at St. Louis, 24 of them have been reported found and are being returned to the Institute by residents of Illinois.

(Continued on Page 6)

"Chemical-Value" Dance Suggests Original Joke

Technology's recent dance at which the admission charge was determined by the chemical value of each girl's body has brought forth an original humorous comment from an unexpected source.

The following letter was recently received by THE TECH:
Gentlemen:

The writer noticed a unique stunt which you have used in determining the rate that you are charging for admittance of your girl friends to your college affairs.

I wonder if it has ever occurred to the instigators of this method what a lot of sport a fellow can have with a few cents' worth of chemicals.

Very truly yours,
The Downes-Smith Company
(Signed) D. A. Dunbar

CHRISTMAS SEASON OPENED AT WALKER

Musical Clubs Dance Features Octet Which Renders An Old English Air

In an appropriate atmosphere created by decorations of huge candles, holly, and laurel wreaths, the Christmas season was officially ushered in at Technology at the annual Christmas Concert and Dance of the Combined Musical Clubs, held in Walker Memorial Friday night.

Featured on the program, which ranged from the classics to jazz was a revival of the octette, a form which has been popular in past years. The double quartette which consisted of
(Continued on Page 6)

DRAMASHOP ANNOUNCES MEMBERSHIP POLICY

Members Only Will Be Eligible For Management And Cast

Dramashop has announced a new policy, in regard to its acceptance of members, to be used in the future productions of the company. This afternoon, at five o'clock, all persons inter-
(Continued on Page 4)

CHEMICAL SOCIETY TO HEAR TALK ON COLORED PICTURES

John A. Seaverns, '84, To Speak At Next Meeting Tomorrow In Room 6-120

HAS HAD A VARIED CAREER

John A. Seaverns, '84, will lecture on color photography at the next meeting of the Chemical Society tomorrow night at eight o'clock in Room 6-120. The meeting because of the general interest of the topic will be open to all.

The lecturer, who received an M. D. degree from the University of Michigan, has led an interesting and diversified career. He has built bridges in South America, worked as a newspaper man, and studied questions of health in many places. He is now the consulting chemist for the New England Laboratory Supply House and treasurer of the "Nucleus", the magazine published by the North Eastern Chemical Society. Despite the pressing of his other activities, Mr. Seaverns still finds time to pursue his hobby, photography. His talk will be amply illustrated with materials and instruments.

This week the Chemical Society will visit the Boston Consolidated Gas Plant in Everett, Mass. The group will thoroughly inspect the plant and will see the Coke Ovens, Coal Gas Ovens, refineries, and other points of interest. All those intending to go on the trip, should sign up at the Main Lobby. The party will leave promptly at 1:05.

SANTA TO APPEAR AT DORM INTELLIGENCE CHRISTMAS DANCE

Jacques Marlow's Waterfront Orchestra Will Furnish A Unique Style of Music

Santa Claus and his bag of novelties will be the featured guest at the Dorm "Intelligence Dance" to be held in Walker Friday, December 14. He has promised to provide some entertainment and distribute paper hats, streamers, and confetti to the guests.

Christmas decorations will provide the proper atmosphere, and the committee is working on several novel ideas to make this an outstanding social event.

Jacques Marlow and his Waterfront Orchestra, appearing in gypsy costumes, will make their first appearance at Tech at this time. This orchestra has its own unique style, and will include many original arrangements of the modern classics. The players have been popularly acclaimed in the nearby colleges.

Questions on the household arts will determine the ability of the feminine entrants, and thus the admission price for the couple. This will vary from \$1.00 to a maximum of \$1.50.

Several novelty numbers will be on the musical program for the evening, including accordion and xylophone selections, and one number by a member of the orchestra who plays two clarinets at one time.

WALKER BOYCOTT BECOMES FIZZLE

Despite rumors of a boycott in the Walker Memorial Dining Hall which was supposed to have started yesterday and to have continued until tomorrow, authorities report that they suffered no diminution in the number of hungry students that are accustomed to buy their meals there. It appears that the boycott issue was either an advertising stunt or a result of a few ambitious Dormitory men.

"Who Are You With?"



Norman Thomas, Socialist Leader

SOCIETY OF ARTS TO GIVE LECTURES

Professor Owen Will Talk On Science And Yacht Sailing At First Annual Lecture

Professor George Owen of the department of naval architecture at the Institute will discuss "Science and Sailing Yachts" in the first of the annual Society of Arts popular science lectures at the Institute on Sunday, December 16, at 4 o'clock. He will il-
(Continued on Page 6)

FACULTY MEMBERS GUESTS AT DINNER

Second Round Table Dinner Meeting Last Night

Prominent members of the faculty will be guests at the second dormitory round table dinner meeting, tonight at 6 o'clock in the North Hall of Walker. The first meeting of this kind was held two weeks ago on November 27. Plans are underway to make these meetings a regular part of dormitory activities, and invitation cards are now being printed.

The following professors are expected at this second meeting. Professor C. W. Berry, Professor C. F. Taylor, Professor J. B. Wilbur, Professor C. Bridenbough, Prof. W. G. Whitman, Professor R. G. Adams, Professor W. P. Allis, Professor O. J. Gatchell.

Blonde Hair Preferred in Construction of Delicate Meteorological Instruments

Norway Is Pioneer In Weather Prediction Methods; Lengthening of Hair in Presence Of Moisture Shows Humidity

"Scientists prefer blondes," seems to be the conclusion of a series of experiments recently commenced by Athelstan F. Spilhaus, '33, research assistant in the department of Meteorology. At least, according to his data, scientists prefer blonde hair in the construction of hygrometers and hygrogaphs. Mr. Spilhaus has been investigating the properties of human hair in the hope of improving the present instruments used by weather forecasters.

Methods of weather prediction now in vogue are based on the observations of temperature, barometric pres-

THOMAS, SOCIALIST TALKS ECONOMICS BEFORE ENGINEERS

Military Science He Says, To Result Disastrously To Rising Generation

SYSTEM MUST PROVIDE FOR ABLE KEY MEN

Present System Likened To Cow Milking Wherein Absentee Owners Get All Benefits

That the application of modern scientific methods to military science and war methods will lead to a very dangerous and undesirable rising generation was one of the contentions of Mr. Norman Thomas at a talk to Technology students and department heads yesterday.

Mr. Thomas addressed his message to students in general, but especially to those at the Institute. He pointed out that inventions and discoveries are being continually being made in an institution of this kind, and that these discoveries may be used to better society or they may be applied to war methods and thus to the destruction of society. He inferred that compulsory military science courses in American schools is undesirable in that it strongly suggests the possible applications of science methods to war.

Fascism or Co-operative Commonwealth? Foremost among the questions facing the new generation, according to
(Continued on Page 6)

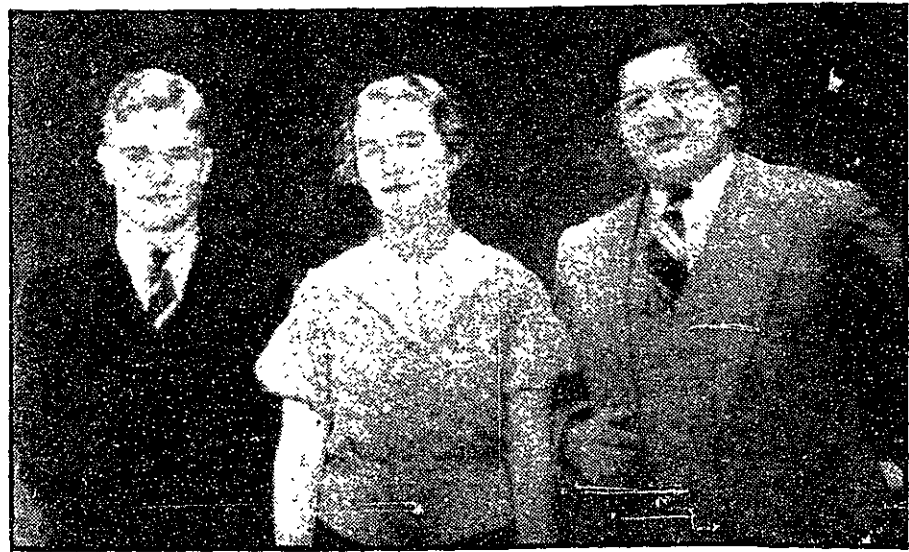
BICYCLE INDUSTRIES WILL SPONSOR SHOW STARTING TOMORROW

Magnificence And Popularity Of Exhibition To Rival Auto Shows

A Bicycle Show sponsored by the leaders in the bicycle industry will be held in Beck Hall, Harvard Square, starting December 12. The exhibition will be modelled after the Automobile Show which came about as a result of the popularity of automobiles. Thus, if the coming cycle show is any kind of a criteria it seems that the trend to cycling may be coming back into its own again.

The show will adapt itself after the plan of an auto show. Maps of routes suitable to long cycling trips will be prominently displayed. Three speed gears, which have made possible many long trips this past summer, easier climbing over hills, and greater speed
(Continued on Page 6)

Will Debate Against Middlebury College



P. W. Stevens, '37, A. T. Hunter, '36, P. R. Scarito, '37

Technology Co-ed Will Participate In Debate, Federal Armaments Monopoly

Middlebury College To Uphold Affirmative Side of Subject; Professor Rogers to Preside During Argumentation Clash

For the first time in the history of argumentation at Technology, a Varsity Debating Team will have as one its components a member of the

"weaker sex". Alice T. Hunter, '36, will support Philip R. Scarito, '37 and Paul W. Stevens, '37, in a debate on the topic: "Resolved that the manufacture of arms and munitions should be a monopoly of the Federal Government", in which the Technology team
(Continued on Page 5)



Vol. LIV DECEMBER 11, 1934 No. 51

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BUSINESS IS GOOD

A WORLD AFRAID

FROM the New York Times comes the item, "Colt's Patent Fire Arms Company voted yesterday a special distribution to employees of 10 per cent of their earnings for the current quarter. Last year its net profit was \$675,132. . . . At the beginning of this year 1,554 employees were listed." The Boston Post carries a notice that on Sunday, Nov 11th, the day of the Armistice, the Vickers Co. of England stopped all operations for two minutes in solemn tribute to the war dead. From other sources comes the information that the company is working three shifts and employing some 30,000 men, the majority of whom, it must be stated, are not engaged in manufacturing armaments.

From Essen, Germany, comes the report that the Krupp works have granted a bonus to their employees because the last business year once more showed a profit. The bonus was from ten to twenty marks for workmen and ten to twenty-five per cent of their monthly wage for clerical employees.

Japan has given her military forces 46% of the national budget while large portions of her farming classes are impoverished to the point of starvation. France worries about her gold standard and makes huge military expenditures. Germany openly rearms.

To the mythical man from Mars it must appear an utterly unreasonable situation. A world suffering from severe economic maladjustment continues to pour wealth vitally needed elsewhere into increased armaments which admittedly give no economic return. A world still licking the sores of one war re-arms with an intensity never seen before in order to obtain security, which like a will o' the wisp remains unobtainable.

Although the ills of fear and suspicion will never be cured by the discredited remedies of increased military forces, no other remedy which nations are willing to accept is in sight, so, for the armament makers, business is good.

IT'S "GOOD" FOR YOU

RADIO CONTROL

ALWAYS boring, and sometimes irritating, is the advertising matter that accompanies almost every radio program in the United States. This commercialism, coupled with what some people claim is a lack of good music and educational programs on the radio waves, brings reoccurring wails for government control of broadcasting.

In considering whether Mammon or, say, the Secretary of Commerce should rule the non-existing ether, it may be well to consider the tale of the frogs who appealed to their god for a king. In answer to the request a log was thrown into the pond, and after the first big splash, which impressed the frogs mightily, it rested quietly, as is the custom of logs. But the frogs, disgusted with the apathy of their

monarch, appealed for a better king, only to receive a stork, with results known to everyone who has read Aesop's fables.

A public demanding better programs may find government a tyrannical ruler. Aside from the fact that no tax can furnish the millions that commercial concerns use to hire the best available talent, the experience of radio listeners in England and Japan indicates that the government is altogether too conscientious in broadcasting programs that are "good" for them. In England certain unappreciative radio owners have demanded more jazz programs. The writer is suspicious that the public's apathy to more educational programs is an evidence of good sense. Teaching over the radio has not the potentialities some give to it, for the pupil must depend entirely on his ears, and has not the benefit of demonstration, emphasis or reference to what has already been said.

But perhaps the greatest danger of one central control over a broadcasting system lies in the radio's potentialities for propaganda. Experience again demonstrates that although commercialism may be a bad ruler over the agencies of news propagation, government is a worse one.

FIGHTING THRIFTILY

GAS WARFARE

THE small chance of ever receiving recompense for the debts incurred during the last year has shown the peoples of most countries the futility of extending great international credit during any war. Their enlightenment, forced upon them during the past few years of world strife, will prove a very significant factor in the winning of any future war which promises to be of long duration.

For in the future, even more than in the past, wars will be fought upon a strictly economic basis. The results of unnecessary and rather lavish expenditures made in the early part of the last war are still upon us; more generally speaking, they are upon all countries—even those who were not active participants.

Yet valuable lessons were learned during that war, the first and most extensive of its kind. And one of the greatest of these lessons was that the easiest way to drain a country of its resources was to place upon it the worry and expense of caring for its own wounded, at the same time decreasing resistance by virtue of the inability of those wounded to participate in active service. A body lying in a cloud of chlorine gas is utterly without resistance, it is true; but a body blistered with mustard gas, or experiencing slow death by Lewisite is not only important, but a heavy burden upon the country for which it has been fighting.

The versatility of gas attacks, inasmuch as they may be used to kill, harass, or inconvenience the enemy, will make their use in the future much more frequent than in the past. Different from the past, however, will be the liberal use of more gas shells, and the greater infrequency of wave attacks. Because of the great preparation needed for the latter, secrecy is almost impossible. Furthermore, the requirement of skilled men to be found in wave attacks is not inherent in attacks by shell, which provide in their versatile spread of smokes, gases, or liquids the most dreaded element of warfare—a surprise attack from a direction least suspected.

The use of gas in trench warfare made it particularly effective because of its ability to penetrate districts where steel would have been useless. Whether future battles will be fought by means of the same methods as those used in the past is uncertain, but not even speculation can remove the great advantage which gas has, and always will have, over steel in this respect. Not until uniforms become air tight, without loss of freedom of movement to the soldier, will gas warfare lose its superiority to a warfare consisting of flying steel.

A REJUVENATED ACTIVITY

VARSITY DEBATING

THE action of the debating society in arranging a varsity debate with Middlebury College is a significant event in cultural activities at Technology. For the first time in nearly ten years the Institute will have the opportunity of entertaining a group of regular debaters this week-end. The Dormitory Committee has made plans to have the visiting team lodged in the dormitories and the members of the team, according to present arrangements, will be invited to attend the Christmas Party "Housekeeping" Dance in Walker Memorial next Friday evening.

Just how much time undergraduates should spend in outside activities has long been a much-discussed problem in Institute life. That they should take every opportunity to broaden their contacts with and interests in the outside world has been the general and rather prosaic answer to this question. The debating society



Heat Notes

In a recent bit of research which we carried out in the interest of a more scientific treatment of mundane subjects, we unearthed the following interesting dissertation in Professor N. H. Frank. Inasmuch as the social season is now well under way and the lounges of Walker come more and more into extensive use, we believe it to be very appropriate. And the association of ideas will no doubt help many students to remember facts which they would otherwise forget.

Thermal Equilibrium

The quotation is as follows: ". . . place such a system of bodies in a closed room free from external influences. In general changes will occur but eventually these bodies will settle down to a quiet state in which no more observable changes occur. They will, according to our sensation of warmth, all seem equally 'hot' or cold. This quiet state is called a state of 'thermal equilibrium' and we shall assume that all bodies left to themselves reach such a state. Of course the time necessary to reach this state may and will be widely different for different initial states and different bodies, but this fact need not concern us here." Proving, we suppose, that there's many a true word spoken in jest, or some such.

Compulsory Military Training

Our friend Tubby, in a recent article, prates of war, and military training, and students who are infants because they are under twenty-one, and generally approves the manner in which the case against compulsory military training has been squelched. He makes the point that most students are practically infants. We would also like to make the point that while the law considers such students as infants

(Continued on Page 3)

CHEMISTRY ALLIED WITH TEST TUBES

Difference Between Chemistry And Chemical Engineering Defined By Whitman

For years we have wondered about the difference between "Chemistry" and "Chemical Engineering"; actually it was the latter term that caused the trouble. "Chemistry" we remembered from 5.01 as having something to do with test tubes and "chemicals".

In the *Tech Engineering News* for January, however, Professor Walter G. Whitman of the Chemical Engineering Department clears up this situation to our satisfaction. We gather from his article that the only connection between the chemical engineer and a test tube exists in the fertile imaginations of those who wonder what it is all about.

Embryo chemical engineers, who
 (Continued on Page 3)

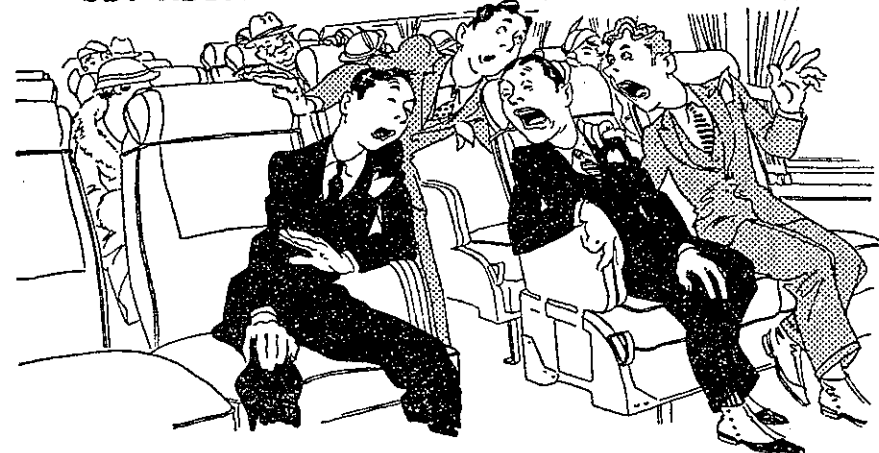


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HOME, JAMES! For Christmas Holidays

Congratulations, students! You need no longer fear that your cellmate — in an unguarded moment — will pawn your extra pair of pants or hock your jewelry to raise the fare necessary to go home Christmas. Greyhound's excursion rates eliminate that danger.

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1 1/2 TIMES THE ONE-WAY FARE FOR ROUND TRIP

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Effective to hundreds of places — not good to New York — certain other cities.

This Christmas you can make the trip home in a modern, comfortably-heated coach, piloted by one of the finest drivers on American highways. Join in the good fellowship aboard, or recline your deeply cushioned chair to the most comfortable angle and let the miles roll by unheeded. Greyhound's frequent schedules enable you to leave almost as soon as your last class is over — and stay until the last possible moment before you return.

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December 12—January 2

at the

BICYCLE EXCHANGE

1201 Mass. Avenue—Harvard Square
 Largest Bicycle Rental and Sales in New England

HAL BEMIS CHOSEN A. M. E. PRESIDENT

Colonel John Kingman Is Guest Speaker At December 6 Meeting

Speaking on "My experiences as a General Staff Officer During the World War," Col. John J. Kingman, C. E. U. S. Army, District Engineer of the Boston Area of U. S. Engineers, was the guest speaker at the first meeting of the M. I. T. Chapter of the Society of American Military Engineers which was held in the Walker Grill Room on Dec. 6.

Capt. J. F. C. Hyde, C. E., faculty advisor, who is responsible for the revival of the Technology Chapter, Col. S. C. Vestal, C. A. were also present at the meeting which was presided over by Hal L. Bemis, '35, president of the organization.

The Technology chapter was revived this term and elected Hal L. Bemis, '35, president and Jefferson Farmer, '35, secretary. The next meeting will probably be held in January in conjunction with the Boston Chapter of the S. A. M. E.

FOREIGN STUDENT REGISTRATION HIGH

43 Countries Send Their Representatives, Recent Analysis Reveals

Forty-three countries including Bermuda, Venezuela, and the Fiji Islands, are represented at Technology as shown by the most recent analysis of foreign registered students by George A. Siegelman, '37, working for the T. C. A.

This year's foreign population is correlated with that of last year, showing that the number of foreign students has increased from 140 to 175, and that four more countries are represented this year than last. Mr. William Jackson assisted in compiling the information.

A list showing the distribution of these students follows:

Country	1934-35	1933-34
Argentina	3	1
Australia	1	1
Austria	4	1
Belgium	2	1
Bermuda	1	1
Brazil	2	0
British West Indies	1	1
Canada	28	30
Canal Zone	0	1
Chile	1	0
China	40	22
Columbia	3	6
Cuba	10	10
El Salvador	0	1
England	7	3
Equador	1	0
Fiji Islands	1	0
Finland	2	0
France	4	3
Germany	4	3
Greece	0	1
Hawaii	3	4
Holland	1	0
Hungary	1	0
India	7	4
Iraq	3	0
Ireland	1	1
Italy	1	0
Jamaica	1	0
Japan	8	4
Java	1	1
Manchukuo	0	1
Mexico	6	7
Newfoundland	1	0
Norway	3	3
Palestine	0	2
Panama	2	1
Philippine Islands	0	1
Poland	1	2
Puerto Rico	4	2
Russia	8	10
San Salvador	0	1
Scotland	2	1
Siam	1	1
South Africa	2	2
Spain	0	1
Sweden	2	2
Switzerland	2	1
Syria	2	0
Uruguay	0	1
Turkey	1	0
Venezuela	1	1
Total	175	140

TRAINING STUDENTS FOR EMPLOYMENT IS DISCUSSED BY NALLE

Speaks At Annual Meeting Of Association Of College Business Officers

A long range method of training students to find the type of employment in which their special aptitudes and training will make them most valuable to their employers, themselves and to society from the point of view of greater public service was discussed by John M. Nalle, placement officer of the Institute at the annual meeting of the Association of University and College Business Officers of the Eastern States, here today.

Describing the work of Technology's placement bureau, Nalle said that its major purpose was to consider the problem of placing graduates in its broadest sense. "Success after graduation depends," he said, "not on immediately getting 'a job', but in seeking opportunities which in the light of individual aptitudes may be considered in terms of a lifetime."

First Jobs Affect Careers Enormously

"The first positions men enter after graduation affect their careers enormously," he declared, "and we are convinced that it is more important for them to locate the correct type of work in their field of training and special aptitudes than to start on a job the first month after graduation. We think of it in terms of a lifetime rather than their first year out of college. Men who find the work for which they are best fitted are more valuable to their employers, to themselves and to society, to which they may be expected to be of greater public service."

Placement training at M. I. T. includes an insight into the requirements of and opportunities in the many branches of science and industry, analysis by each student of his special abilities, and an understanding of the basic principles of employment.

Discussing the employment situation, Nalle stated that in November, 1934 only 10.6 per cent of students awarded advanced degrees at Technology last June were not employed, while 22.6 per cent of the men awarded bachelor's degrees had not found positions.

The Lounger

(Continued from Page 2)

when it suits its ends, the government does not hesitate to teach those same "infants" the noble principal of "kill or be killed."

Electioneering

We have got to hand it to those students who posted the notices advocating boycotting of a local eating place. Of all the possible places to put such notices they certainly chose the most effective. But we don't think the Institute Committee will resort to posting their notices on the walls of the men's room for a while yet.

Bundling

Flash! Flash! Rumors of a potential scandal among our staff members have been circulated. Prominent members of the student body are known to have participated in a bundling orgy. And on a Sunday afternoon too. But wait a minute, before you call out the vice squad. Latest reports indicate that the "bundling" consisted merely of wrapping packages for the Post Santa. And so ends a perfectly good story.

Why?

Foolish question number 266177. Why did the Dorm Intelligence Dance Committee get out a new set of posters?

Bright Expectations

Jean Harlow, according to news items, is well on the way to getting another divorce. We think it's third down, fourth coming this time, but we lost count quite a while ago. You know, we used to be a great admirer of hers. Time was when we'd sit through one or flier pictures after another, hoping to get more than we paid for. But the dress never did slip

... At Princeton

AN UNFAILING SENSE OF STYLE HAS LONG BEEN EVIDENCED IN THE CLOTHES OF PRINCETON UNDERGRADUATES AND ALUMNI, AND HAS MADE ITSELF A NATIONAL FACTOR IN FASHIONS FOR MEN.

APPAREL ARTS, men's style authority, says:

"Every forward-looking men's store merchant ought to take a trip to the Princeton campus. The point of this would be... something of an intangible nature that goes by the name of fashion."

Princeton men have never approved the bizarre or the extreme in apparel. Therefore the statement of Gommy, Incorporated, famous Princeton tailor and specialist in men's wear, is important.

.....Gommy..... says: "The difference between fine tailoring and commonplace work is all in the attention given to what some people call little things. Every detail of a man's clothes is important to us, that is why we equip the trousers made in our shop with the Kover-Zip fly. In both style and fit, it is superior to the buttoned fly and is a big improvement over the ordinary uncovered zipper because the metal is hidden."

Princeton men have endorsed Kover-Zip, the invisible seamline closure for trousers, as an essential of correct apparel.

Outstanding college tailors, arbiters of style, endorse Kover-Zip as the only slide fastener fit for fine custom clothes

WALDES KOH-I-NOOR, INC., LONG ISLAND CITY, N.Y.
PARIS PRAGUE DRESDEN WARSAW BARCELONA LONDON

"BEST-DRESSED" MEN AT BIG COLLEGES COMMEND KOVER-ZIP

American college men have a sure instinct for improvements in apparel that add to the smartness of the things they wear. A typical instance of this style-sense was the nationwide approval of the Kover-Zip fly by "best-dressed" seniors at the great universities from coast to coast. Here are some of many comments on this invisible seamline closure by college men who were selected as "best-dressed":

T. R. Bassett
Princeton, 1934

"The covered zipper fly is neatness and perfection for trousers and slacks—quite an improvement over the ordinary zipper with its unsightly strip of raw hardware."



Jack W. Hoerner
Stanford, 1934

"The new covered zip with the invisible fastener has the finished appearance which is so necessary. I am in favor of this new fastener for campus, sport and dress wear."



Albert E. Newman
Michigan, 1934

"The flashy metal of the uncovered slide fastener did make you flinch, but this new covered zipper is neat as a seamline. Write me down as voting for the covered zip."



John A. Hooley
Yale, 1934

"I've never seen a fly-fastening device of any kind that compares with the Kover-Zip—good taste would rule out the uncovered slide fastener with its strip of exposed metal."



ALPHA CHI SIGMA TO INITIATE NEW MEN

Professor Morris Will Speak At The Boston City Club

A formal initiation banquet of the Alpha Zeta chapter of Alpha Chi Sigma will be held on Saturday, December 15 at 6:30 o'clock. The initiation will take place at the Boston City Club. The society announces the election of Henry F. Hoppers, '36, Louis C. Smith, '36, Richard S. DeWolf, '36, and Gerald S. McMahon, '36.

Professor F. K. Morris of the Geology Department will be the speaker of the evening.

As an added feature the banquet will be combined with the Omicron chapter of Harvard.

CHEMISTRY ALLIED WITH TEST TUBES

(Continued from Page 2)

want to get some idea of what the field offers, will be satisfied by reading "Problems of the Chemical Engineer."

"The Greeks Had a Letter for It" by Beverly Dudley, '35, is an historical analysis of the origin of the value of pi. The approximate numerical value can be traced to the Greeks; the use of the letter "pi" in this connection to Leonard Euler and the 18th century.

For those who are interested in the exact value of pi, there is a table giving it to what seems to be an infinite number of places.

Quoting the article, "... and his son published a work in which the value of pi, using the method of exhaustion employed by Archimedes, was..." At this point we paused to read the table, and when we had finished were too exhausted to read more.

Incidentally we have "heard" of a creature living in the dorms who has memorized the value of pi to 17 places. Mr. M. J. Anderson, of the Matthews Conveyor Company, writes on "Solving Production Problems with Conveyors." He reviews their application to modern business, giving concrete illustrations of their use in typical industries.

What few readers we have may wonder if we actually read the magazine

from cover to cover. Let it be understood now that if we do not, we tell you.

For example we started "Supplying Bullets for the Van De Graaf Gun" by Godwin Gay, '37. Before very far, however, it suddenly struck us that we were glossing over terms too technical for our ken.

With a slight feeling of annoyance we laid it aside. Annoyed not because we felt the article had little to offer, but vexed in that we felt anything so technical *must* be good.

Some time ago we mentioned here some of the "infant" industries of today. We forgot to include television in that list, but in the *Engineering Digest* are some notes destined to keep us abreast with the times.

It also speaks of all metal vacuum tubes, but with the air of one who casually turns on his radio and hopes for pleasing results, we glossed that over too.

In case you are interested, we are taking Mr. Gay's article home for further perusal.

R. D. M., Jr.

CRIMSON WILL PLACE VETERAN TEAM ON ICE

(Continued from Page 1)

prove themselves a real team. Van Patten-Steiger, Tech goalie, had trouble with long shots throughout the evening. On close shots, however, he was hard to pass.

Don Kenny, Tech's other goalie, has completely recovered from the acid burns in eye and will be back in uniform tonight. It is not certain, however, whether he or his more experienced rival for the position, will get the call tonight. The rest of the starting lineup will be the same as against Princeton: Leman, Mathias, Goodwin, Driscoll and Parker.

The pucksters will have their work cut out for them tonight by a veteran Crimson team. They have the advantage, however, of having already played one contest, while this will be Harvard's opener.

In the preliminary at Boston Arena tonight, the Harvard frosh will take on a local prep school team, but only one period will be played before the feature event. The prelim goes on at 8, the M. I. T.-Harvard game begins at 8:30.

FRESHMEN VICTORS ANNUAL INTERCLASS MEET SATURDAY

Kites Piles Up 13 1/2 Points For Team; Blair Takes Best Race Of Day

FRESHMEN WIN 53 POINTS

Scoring 13 1/2 points individually, Luther Kites led the freshmen to victory in the first interclass meet held Saturday afternoon.

Defying the cold winds which swept across the outdoor board track, the freshmen piled up a score of 53 points. Seniors took second place with 17 1/2 points, Sophomores won 14 1/2 points and Juniors 6.

Tom Blair won the best race of the day as he nosed out Wally Pulsifer, Eugene Cooper, and Albert Faatz in the two-lap race.

50-yard dash—Won by Henry Runkel, '36; second, Walter Pulsifer, '38; third, Nestor Sabi, '37; fourth, Henry Sieradzki, '38; fifth, Eugene Cooper, '37; time—6 seconds. 40-yard low hurdles—Won by Bayden; second Tom Blair, '35; third, Luther Kites, '38; fourth, William Bender, '38. Time—6s. 2-3's mile—Won by Ciro Scalingi, '38; second, Douglas Chalmers, '35; third, Robert Campbell, '38; fourth, William Benders, '38; fifth, Albert McCullough, '37. Time—3m. 18s. Running broad jump—Won by Robert Hadley, '38; second, Luther Kites, '38; third, William Bates, '35; fourth, John Lindsay, '38. Distance—20ft. 5in.

High jump—Tie for first, between Nestor Sabi, '37 and Luther Kites, '38; third, John Lindsay, '38; tie for fourth between Robert Hadley, '38 and William Bates, '35.

Shot put—Won by Robert Hadley, '38; second, Luther Kites, '38; third, John Lindsay, fourth, William Bates, '35; fifth, Henry Runkel, '36. Distance—38ft. 5in.

Two laps—Won by Tom Blair, '35; second, Walter Pulsifer, '38; tie for third between Eugene Cooper and Albert Faatz, '37; fifth, John Keefe, '38. Time—55s.

DRAMASHOP ANNOUNCES NEW MEMBERSHIP PLAN (Continued from Page 1)

ested in becoming a member of Dramashop will meet on a competitive basis. The basis of competition will be their ability to act, or as the case may be, to manage.

Those persons, because of their proficiency, who become members, are the ones who will be eligible for parts in the cast and the managerial staff of all productions staged by Dramashop in the future.

Today is the last chance for those interested in participating in the next production and they are advised to go to Room 2-178, today, at 5 P. M.

Uniform Numbers of Boys Who Play Harvard Tonight

For your convenience, THE TECH has secured the uniform numbers of the M. I. T. hockey team. Cut this out and take it to the opening home game tonight at Boston Arena. The pre im will begin at 8:00 and Tech will take the ice against Harvard at 8:30 P. M.

No.	Name and Class	Position
2	Forsburg, George, '35	Wing
3	Leaman, Jean, '36	Center
4	Healy, William A., '36	Wing
5	Mathias, Fred (Capt.), '36	Wing
6	Cohen, Jacob, '37	Center
7	Goodwin, Herbert, '36	Defense
8	Driscoll, Robert, '36	Wing
9	Winsor, Kenneth, '37	Defense
10	Parker, Franklin, '36	Defense
11	Van Patten-Steiger, Robert, '36	Goal
12	Notman, James, '35	Defense
14	Kenny, Donald, '36	Goal

SWIMMERS DEFEATED AS GRANBERG STARS

Engineers Lose 54 To 23 In Opening Meet Against Springfield

Taking but two firsts in a total of eight events, the varsity swimming team was defeated by Springfield College on Saturday by a score of 54 to 23. Vonnegut placed first in the 220-yard breast stroke to account for one of the firsts and the other came in the 400-yard free style with Patterson, Finlayson, Rutherford, and Granberg swimming in that event. Granberg, the Tech captain, was the leading Beaver scorer, he placing second in the 40-yard swim and third in the 50-yard backstroke event in addition to being on the winning relay team.

The scoring was as follows: 200-yard medley relay—Won by Springfield (Case, Wulff, Chapman). 220-yard swim—Won by Holland (S); Raymond (S); Haywood (T). 40-yard dash—Won by Hoch (S); Granburg (T); Harvey (S). Diving—Won by Martyn (S); Haywood (T); White (S). 440-yard swim—Won by Pawling (S); Scott (S); Hamilton (T). 50-yard backstroke—Won by Squires (S); Sugden (S); Granburg (T). 220-yard breast stroke—Won by Vonnegut (T); Wulff (S); Longley (S). 100-yard dash—Won by Hallock (S); Browne (S); Patterson (T). 440-yard free style relay—Won by Tech (Patterson, Finlayson, Rutherford, Granberg).

SPORTS COMMENT

That football game which was to be played between THE TECH and the Theta Chi fraternity yesterday was called off Saturday night because of the severe cold weather. The managements of the two teams were in agreement that for the sake of all concerned it would be better to cancel the game entirely, with the chances for better weather conditions in the future being very slim.

At its last meeting, the Advisory Council on Athletics voted down a motion to establish baseball as a varsity sport this year. Although admitting the existence of considerable interest in the sport, as evidenced by the highly successful interclass season last spring, the Council decreed that no sport could be given straight varsity recognition without first having been carried on as a provisionally recognized sport. The Council tabled the subject until its January meeting, at which time it is possible that provisional recognition may be granted.

We were talking with Don Kenny, first string goalie of the hockey team, yesterday and he told us that his eye was back to normal again after its being burned with acid last week. Don will probably be in the nets tonight against Harvard at the Arena. George Owen's sextet will be meeting its second strong opponent in four days, but we look for the Beavers to make a better showing than they did against the sons of Nassau.

With Cleon Dodge out, the swimming team will be materially weakened in its meet with Wesleyan Saturday. Cleon's absence last Saturday held down Tech's score, for he was counted on to win in the dash events. At present it is expected that Dodge's had ankle will keep him out of action until after the Christmas vacation.

Wesley Fesler's aggregation of Crimson basketballers certainly showed the Tech hoopsters a thing or two Saturday night. The Crimson system of working the ball in under the Engineers' basket was extremely effective, with the Tech defense being repeatedly blocked out of the plays. Tech was weak on following up its shots and its offence was sadly conspicuous by its almost complete absence. Time after time a Tech player dribbled down the floor and into a corner, there to be hemmed in by a Harvard man, and left with a chance to pass in only two directions, either back or to one side. This made the work of the Harvardians rather easy.

It is high time that the Tech basketballers were taught some definite system of offense to use in working the ball in close to their opponents' basket. Even Harvard's second team was able to far outscore the Engineers, by effectually using Fesler's system of attack. In the past two or three years Tech teams have been able to get along without an organized attack because they have been fortunate in having such outstanding forwards as Gene O'Brien and Fred Feustel. The present outfit has no such classy forward, but if taught some definite mode of play, this season's team should be able to work together well enough to make a much better showing than it did Saturday. Until the players are so instructed it is our belief that the rest of the season will be but a succession of defeats.

CRIMSON FIVE ROMP OVER TECH CAGERS

Engineers To Meet Clarkson Quintet At Hangar On Thursday

In spite of Technology's utmost efforts, the Harvard hoopmen overwhelmingly defeated the Engineers to the tune of 45 to 12. At no time during the game was the Crimson team in danger. They had an offense which clicked with smart precision and scored easily at any time during the game. During the beginning of the contest, their fake passing had Tech baffled. On the other hand, the Engineers' passing and playing were quite ragged. However, they fought with a will up to the final gun. This was their first game, and doubtlessly as the season wears on better co-ordination and teamwork will be established.

Though the frosh also lost to Harvard, they fared better—the final score being 38 to 17. The M. I. T. freshmen played a fine game throughout, Bullwinkel as guard being the outstanding player.

Clarkson University will show up at the Hangar Thursday night to give the varsity cagers another battle. Clarkson always manages to put an excellent team on the court; so it looks bad for the Engineers. However Tech is sure to have a fighting team on the floor at all times.

UNDERGRADUATE NOTICE

T. C. A. Ticket Service announces that for the sixth consecutive year representatives from the Boston and Albany, New York, New Haven and Hartford and Boston and Maine Railroads, together with a separate representative for bus, airplane and steamship lines, will be present in the T. C. A. back office from 12:00 noon to 2:00 P. M. daily, from Wednesday, December 12th to Friday, December 21st, inclusively. Tickets, reservations and information may be secured from these representatives at no advanced prices.

FINALS FOR ALL TECH TOURNAMENT HELD ON FRIDAY

Peyton Wins Heavyweight Title, Torrance Wins In Two Classes

FRESHMEN SHOW UP WELL

The all Tech Wrestling tournament was brought to a successful close last Friday afternoon when Ricks' charges went through their paces, competing for the finalist honors in their respective classes. Besides being successful from the fact that the tournament brought out some men who would not have otherwise competed in the sport, the meet was doubly successful in that Ricks found two men on whose shoulders he may rest the burden of several of his classes.

The rarest find was in the person of Newton Peyton, a freshman, who defeated Ricks' leading varsity contender in the heavyweight class, and who swept on through all comers, including Leon Baral, also a freshman, whom he defeated in the finals. The other find, was Tommy Torrance, an unexperienced sophomore who won finalist honors in two classes. In the 118 lb. class, he defeated Pete Iwatsu, a freshman, and in the 126 pound class he defeated Howard Milius, another freshman.

In the 135 pound class Craig defeated Bartholemew; in the 145 lb. class Webb defeated Carchia; 155 lb. class, Baggerman defeated Arnold; 165 lb. class, Heal defeated Arnold; in the 175 lb. class, Pellam defeated Strom; heavyweights, Peyton defeated Baral. In the near future all the winners will receive gold medals from the M. I. T. A. A.

cause of argument and resulted in the sending of several scores to the National Rifle Association at Washington for final judgment.

The Institute Rifle men and their scores are as follows: Hawks, 183; Kincaide, 182; Hall, 178; Keithley, 177; Peterson, 177. The Beverly Rifle team consisted of the five men also who with their scores are as follows: Scott, 181; MacLeod, 180; Robinson, 180; R. H. McNeil, 178; D. C. McNeil, 176. Each man shot ten shots prone and ten shots off hand.

The Rifle team may take a trip to Worcester Institute of Technology.

UNDERGRADUATE NOTICE

There will be a dinner meeting of the Naval Architecture Society in the Grill Room of Walker Memorial next Friday evening at 6:30. Mr. Burkhardt, chief engineer of the Fore River Plant, will give a talk.

For Students and Faculty Rail Fares Reduced 1/3

The railroads appreciate the enthusiastic responses of students and faculty to the "College Special" fares which combine economy with the great advantages of rail travel—safety, speed, comfort and convenience.

If you bought one of the reduced fare round-trip tickets when you came to school this Fall, the coupon is good returning home between December 10 and 25. When coming back after the Holiday, be sure to take advantage of this one and one-third fare ticket, the purchase date for which has been extended to January 16. Diagram below shows going and return dates.

GOING TO SCHOOL		RETURNING FROM SCHOOL		
Round-trip ticket may be purchased at Home Station during any one of the periods named below:		Return portion of ticket may be used to Home Station during any one of the periods named below:		
		Christmas 1934	Spring 1935	Close 1935
		Dec. 10-25	Mar. 9-Apr. 20	May 15-June 30
Dec. 25, 1934-Jan. 16, 1935	Mar. 9-Apr. 20	May 15-June 30
Mar. 15-Apr. 23, 1935	May 15-June 30

Going trip must begin on date ticket is purchased—limited to reach school station within ten days. Return trip must begin on date of validation of ticket by railroad agent at school station—limited to reach home station within ten days. Tickets good over same route both ways. Stop-overs will be allowed in each direction. Tickets good in coaches, also in Pullman cars, upon payment of regular Pullman charges. Baggage will be checked under the usual regulations. No certificate or other form of identification necessary.

TRAVEL BY TRAIN

Assuring your comfort with speed Your convenience with safety.

NEW ENGLAND PASSENGER ASSOCIATION RAILROADS AND STEAMSHIP LINES

RIFLEMEN TIE WITH BEVERLY MARKSMEN

Visiting Shooter Protests His Score; Protest Sent To N. R. A.

After a hard fought tense, struggle to conquer the Beverly Rifle and Revolver Club the contest resulted in a tie and a new high range score for this year of 897 points. One of the scores made by a member of the Beverly Rifle and Revolver Team was the

THE STORE FOR MEN

JORDAN MARSH COMPANY



Give them gifts they would buy for themselves!

"GIFT HEADQUARTERS FOR BUSY MEN"

If you're too busy to shop, or if you have the normal masculine aversion for shopping outside your own territory, we'll do it for you. Just drop into the Store for Men any day between now and December 24th, and our staff of experts will not only suggest a gift for the various types and ages on your list, but they'll go shopping either with, or for you. You can be sure they'll choose just the right things for you, even to sprig of holly on the package, if you want it.

SIXTH FLOOR—STORE FOR MEN

CO-EDGEWISE

Marriage or a career? Which would M. I. T. co-eds choose as essential to a happy life. "Why both of course," say these very surprising young ladies. Just two of these prospective scientists and engineers seemed to disagree. "It can't be done," said one fair co-ed very earnestly. "Either one or the other is bound to be subordinated and eventually be utter failure."

"Subordinated, yes, but not a failure," said another miss who was in favor of what she called a combined career of marriage and science. "Well, which would you subordinate," we asked. "Oh, it depends on which is the most interesting when I get around to doing both," was the nonchalant answer. But how about the children of a woman with a career? "Don't have 'em." And that seemed to settle that.

One lone co-ed insisted that a career was her only interest, at which everyone opened their eyes wide. In fact it was the very co-ed that we had predicted would most certainly be married before the year was out.

But why can't you marry and combine your life's work with that of your husband. "Nothing doing," she flared back, "I want some credit for what I do." Indeed the pretty little blonde co-ed seemed to have little or no interest in the ancient and honorable institution of marriage.

The one co-ed who believed that

marriage was the only true career for women, hopes to use her scientific knowledge as a hobby and a diversion, not as a means of livelihood.

When the discussion became so involved that mean values for the number of marriages before graduation were being computed, the respective co-eds began to realize the number of mean value computations in regard to physics problems that were being neglected, and so the session broke up.

STAGE and SCREEN

FINE ARTS

"All Quiet on the Western Front" starring Lew Ayres and the late Louis Wolheim, revived by the Adult Educational Council of Boston, will be the feature of the program this week at the Fine Arts Theatre.

Lew Ayres portrays the average German youth of the war era who fervently and patriotically upholds his fatherland and the Kaiser. After a few years of relentless and furtive fighting, his fervor and patriotism is no more. This war picture, that should end war, was the cause of many riots in Germany when it was presented there.

On the same bill, is "La Cucaracha", a short technicolor picture which will prove to be 1934's outstanding short picture. On the same program are "Volcanoes", the last of the geology series and "Born to Die", the first of the Zoological Series.

PREFER BLOND HAIR IN WEATHER DEVICES

(Continued from Page 1)

of high and low pressure and can thus forecast weather to a much greater accuracy. The United States Government has consequently fallen in line with this new development by establishing airplane bases at 20 of the meteorological stations.

Difficulties arise, however, even in the operation of this system. Particularly do they occur in the recording of humidity. It is this aspect of the work that Mr. Spilhaus' experiments concern.

It has long been known that the human hair acts peculiarly in the presence of water vapor. When there is a considerable amount of moisture in the air, hair elongates, and conversely, it contracts when the air is dry.

Thus, by measuring the amount of elongation of the hair, using, of course, very delicate instruments, experts are enabled to measure the amount of humidity present at any given place.

This system would seem quite ideal, except that a further difficulty is encountered because the hair does not register the moisture content immediately; there is a certain "lag". It apparently requires some time for the moisture to take effect on the length of the hair. This time Mr. Spilhaus calls the "lag" and it is the properties of this "lag" that he is investigating with the hope of determining its causes and characteristics.

Thus far his efforts have been directed to determining the temperature coefficient of linear thermal expansion and effect of moisture and pressure on various samples of human hair. He has determined that blonde hair is the most responsive to experiments.

In investigation the coefficient of linear thermal expansion, Mr. Spilhaus has constructed a rather simple apparatus consisting of a hair suspended beside a "invar bar" (an alloy having a coefficient of linear expansion equal to zero). There is a scratch on the bar and a mark on the hair. By surrounding the instrument with water and ice, then again by steam, the movement of the hair mark and relative to the bar scratch the elongation may be determined. This is very similar to an experiment performed by freshmen in 8.02 laboratory.

A second apparatus, slightly more complicated than the first enables him to measure the effect of moisture and pressure. It consists of a "pressure cooker" of the ordinary variety, but so arranged that a turn of a handle exposes the suspended hair alternatively to dry air and wet air, at any desirable pressure. To "wet" the air, it is bubbled through water. To "dry" it, it is passed through concentrated sulfuric acid. In this way, quite accurate results are obtained of the effect of temperature, pressure, and humidity on the hair.

Mr. Spilhaus has declared that he has taken only the preliminary steps, but that eventually he hoped to collect a sizeable amount of data and to determine precisely the cause and nature of the "lag". When this has been done, much greater accuracy can be obtained with the human hair hygrometer and hygrograph, a similar instrument which makes a continuous record of humidity by scratching a smoked glass plate.

ARMAMENTS IS TOPIC OF DEBATORS FRIDAY

(Continued from Page 1)

upholds the negative side against the Middlebury College team.

The debate will take place Friday evening at 7:30 P. M. in Room 6-120, with Professor Robert E. Rogers officiating as chairman.

The Tech team has been working under the direction and coaching of A. C. Watson, faculty advisor of the Debating Society.

The Middlebury team, which will reside at the Graduate House during its stay here, has a reputation for excellence in debate as evidenced by the fact that it is debating Boston University over radio station WNAC on Thursday afternoon.

The M. I. T. Team, however, will present plenty of competition to their out-of-state opponents and also has created a reputation for excellence in the art of argumentation since it has never suffered a defeat since its inauguration. The Technology team is also planning a radio broadcast of a debate over station WHDH in the spring.

Competition for managerial positions on the debating teams is now open. Any person desiring to become a candidate for this position should leave his name with Mr. A. C. Watson in Room 2-330.

Those desiring to attend the Dorn Dance that night will have the time to bring their "one and only" first to the debate, then to the dance.

Away From The Grind . . .

The Phi Gamma Delta dance Friday night had everything a good fraternity dance should have: orchestra, crowd, surroundings, but spirit was lacking. It could have been a Newton girl's club dance for all the cutting that was going on. Of course the atmosphere of a dance should not influence you to do something which you will regret afterwards, but there is a state of happy abandon between the extremes. May we suggest that the Phi Gam's would without doubt give the best fraternity dances of the year if they were a little better hosts.

It seems the use of an amplification system has become an accepted addition to fraternity dances. At the Alpha Tau Omega dance, Saturday night, amplifiers made it possible to dance in three rooms to the improved strains of Roger DeWitt and his orchestra. A feature of the dance was a trombone player who played with his toes to the accompaniment of the orchestra.

It was forty below (more or less) outside, but they warmed up at forty a throw inside, and the Waterfront Club was a scene of revelry by night as the Sigma Nus threw their Friday dance. Tom Anderson did a pretty good job of providing music, and the large crowd seemed to enjoy itself. Said Waterfront Club, an ex-speakeasy with all the fixin's, made a welcome change of scene for a dance, and provided it is not done more than once a year, the location was well chosen.

Celebrate the relief of the 7th anti-Hanfy demonstrators
Victory Ball—Ritz Plaza Hall
218 Huntington Ave., Friday, Dec. 14
Walter Johnson and his orchestra
Admission 35c in advance
40c at the door
Auspices: International Labor Defense

Physics Department Develops Two Instruments for Spectroscopic Study

One Automatically Computes Wave Length of Spectrum Lines; Other Determines Energy of the Molecules

Two instruments which greatly speed up spectroscopic studies have been developed at Technology by the department of physics. One automatically measures and computes the wavelengths of spectrum lines, while the other, known as an "interval sorter," determines the energy of atoms and molecules from their spectrum lines.

Spectroscopy, which is the study of the composition of matter through analysis of the light emitted by atoms and molecules, has become one of the most important fields of modern science. Its far-reaching applications extend through physics, chemistry, metallurgy, astronomy and medicine. It has made possible a knowledge of the composition of the stars, and has opened a new approach to the diagnosis and treatment of some of the most baffling diseases, including metallic poisoning.

Accuracy of Results Increased
The new machines, which were developed by Professor George R. Harrison, director of the Institute's spectroscopy laboratory, not only do away with much of the arduous labor of measuring and computing in spectroscopic analysis, but increase the accuracy of the results.

Hitherto, to measure a spectrum the plate on which it is photographed was placed on a comparator, a delicate machine capable of making accurate measurements to within 1/25,000th of an inch. The distances of the spectrum lines from some standard line were then observed by the operator and recorded to six or seven decimal places. For a plate containing many lines, this painstaking task might require several days. To avoid errors caused by temperature changes in the comparator mechanism, each plate had to be measured several times and the results reduced by complex calculations. By this method, an operator might work for a week or more before discovering the value of his first final wavelength.

Measurements 20 Times Faster
Although the new machine for measuring the wavelengths of spectra is still in process of development, it makes measurements 20 times faster than by the conventional methods and the results are twice as accurate. Further development of the machine is expected to make it 200 times faster than the old method.

In the new machine a beam of light takes the place of the eye in recording

the measurements. This beam passes through a plate on the comparator and controls a photocell-amplifier system, which operates a thyatron and flashes a mercury arc when the instrument is set on the peak of a spectrum line. The light from the arc photographs on a moving film the readings of the various wavelengths, which appear on a set of whirling dials.

Having identified the spectrum lines of an atom, the spectroscopist proceeds to determine its energy levels, which are clues to the structure of the atom. This process is speeded up hundreds of times by the new interval sorter developed by Dr. Harrison. Up to the present it has been necessary to take the reciprocals of all the wavelengths and subtract them from one another in a search for constant differences of wavenumber. These differences, when they occur oftener than might be expected by chance, indicate important energy levels in the atoms. It has been the practice to make these subtractions mentally and the investigator may make as many as 100,000 computations in an analysis.

50,000 Subtractions Per Minute
The interval sorter makes subtractions automatically and it has the amazing capacity of 50,000 a minute, while at the same time it sorts out the wavelength intervals and records them photographically. The reciprocals of the wavelength values are recorded on a perforated paper tape which moves through the machine horizontally, passes over a roller and turns back under itself. Whenever holes in the upper and lower parts of the tape coincide, a beam of light penetrates to a sheet of photographic paper beneath and registers the position of the holes. When such a study is completed the photographic paper is dotted with tiny marks, the positions of which are measures of the distance between the holes producing them. Thus every line is subtracted from every other line and a study of this record quickly reveals information which can be gathered by other methods only after slow and arduous analysis.

The development of the wavelength measuring and interval sorting machines greatly increases the potential effectiveness of the Institute's unique facilities for spectroscopic research. Up to the present photographs of complex spectra produced in the course of a few hours would keep several men measuring, computing and tabulating results for several months. Rapid analysis with the new machines means that the facilities of the laboratory can be kept in regular use for a program of research which promises much for the future.



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FINE ARTS THEATRE BOSTON NOW PLAYING

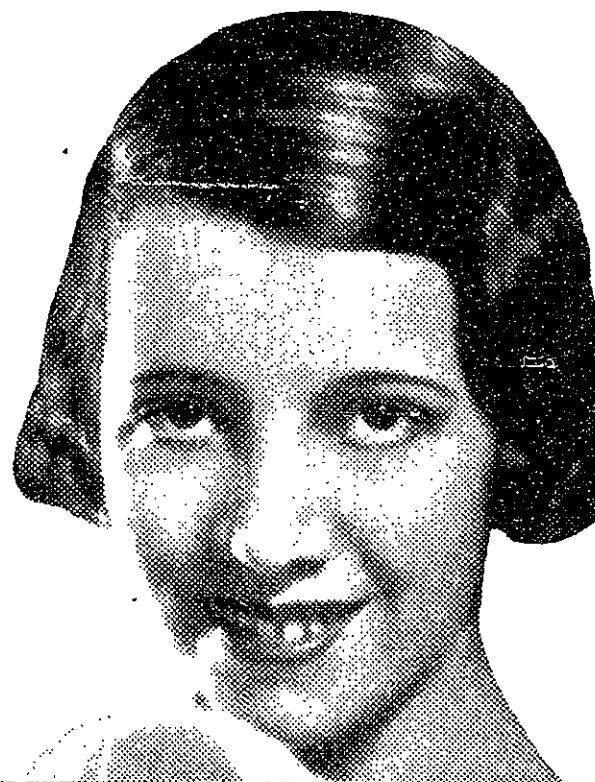
"ALL QUIET ON THE WESTERN FRONT"

AND "LA CUCARACHA" "THE MEXICAN GEM"

Begins Thursday

"CAIRO SEASON"

All the enchantment of ancient Egypt in this gay German musical film romance



"YOU WHO ARE STUDYING FOR RADIO OR OPERA should choose a throat-ease cigarette" says Lily Pons

LILY PONS . . . famous as a star of opera, radio, and the concert stage

CALENDAR

Tuesday, December 11

2:00—Electrical Engineering Colloquium, Room 10-275.
 5:00—Banjo Club Rehearsal, East Lounge, Walker Memorial.
 5:00—Glee Club Rehearsal, Room 10-250.
 6:00—Society of Automotive Engineers Dinner, North Hall, Walker Memorial.
 6:00—Dormitory Round Table, Grill Room, Walker Memorial.
 6:15—Orchestra Rehearsal, East Lounge, Walker Memorial.
 8:30—Hockey, Varsity vs. Harvard at Boston Arena.

Wednesday, December 12

5:00—Christian Science Society Meeting, Room 10-200.
 6:00—Graduate House Dinner, North Hall, Walker Memorial.
 6:00—American Society of Civil Engineers Dinner, Grill Room, Walker Memorial.
 7:00—Dormitory Basketball, Hangar and Walker Gymnasiums.
 8:00—Chemical Society Meeting, Room 6-120.

Thursday, December 13

1:05—Chemical Society Trip to Boston Consolidated Gas Plant, Leave Main Lobby.
 3:00—Theoretical Seminar, "The Electrical Conductivity of Metals", by Prof. N. H. Frank, Eastman Lecture Hall.
 4:30—Physical Colloquium, Report of Electronics Group, Eastman Lecture Hall.
 5:00—Banjo Club Rehearsal, East Lounge, Walker Memorial.
 5:00—Glee Club Rehearsal, Room 10-250.
 5:00—Debating Society Meeting, West Lounge, Walker Memorial.
 5:00—Commuters' Bowling, Wakefield vs. Melrose, Newton vs. Winchester, Walker Memorial.
 8:00—Basketball, Varsity vs. Clarkston, Hangar Gymnasium.

HARVARD COMMUTERS PLAN TO FORM CLUB LIKE TECH'S 5:15

More Adequate Facilities Sought
 G. Golden, Instigator

Plans to establish a club at Harvard similar to Technology's 5:15 Club are being pushed by a group of Harvard commuters, who are seeking more adequate athletic and social facilities than are provided by the Phillips Brooks House. Joseph D. Golden, '35, president of the Technology club, is the instigator of the movement.

The Phillips Brooks House was charged with keeping athletics in the hands of a few upperclassmen and confined to students living in Claverly and Mt. Austin Street. Criticism was also made of the overcrowded conditions at the lunchroom.

Under the proposed system the club would have its own teams and would admit only commuters. Better representation on the student council is also sought.

MUSICAL CLUBS DANCE HAS VARIED PROGRAM

(Continued from Page 1)

David Buckwalter, Richard Hughes, Gerald Rich, Edward Morris, Walter Saylor, Harold Everett, Louis Birchall, and George Akin, rendered a spiritual, and an old English air that were well received. The informal atmosphere was supplied by Bernard Whitman, '35 and his magic. Particularly well received were the violin duets given by Justin Shapiro and Edward Gelus.

Music for the dance which followed the concert was supplied by Paul St. Regis and his orchestra.

The clubs were under the leadership of Richard L. Hughes, '35, Frank S. Walters, '35, and Allan Creighton, '35, and are coached by William Weston and George Hoyer.

The matrons were: Mrs. K. T. Compton, Mrs. L. F. Hamilton, Mrs. J. R. Jack, and Mrs. R. T. Jope.

BICYCLE SHOW STARTS EXHIBITION TOMORROW

(Continued from Page 1)

along level ground, will be the nucleus for a touring display.

The latest developments in cycling will be shown. These include a speedometer, a dynamo lamp, front and back brakes, electric horns, three speed transmissions, and balloon tires. All of these improvements tend to bring about a stronger resemblance between the bicycle and the automobile.

An interesting feature of the show will be the historical display, which will trace cycling through the stages of the high-wheeler, the chainless cycle, the "Safety" and others which used to delight the old folks on Christmas day.

The interest which has already been aroused over the art of bicycling indicates that this exhibition will be a highly successful forerunner of many such showings which will rival the Auto Show in magnificence and popularity.

T. E. N. CONTAINS STORY ON CALCULATING PI

Tech Engineering News, appearing on Saturday, Dec. 12, presents a variety of topics dealing not only with engineering, but with mathematics as well.

Among the articles are "The Problems of Chemical Engineering", by Walter H. Whitman, "Developments of Calculating II," discussing the methods of deriving that quantity, "Conveyors", indicating a solution for cutting expenses in mass production, and a treatment of "Supplying Bullets for the Van de Graaf Gun."

SOCIETY OF ARTS WILL HEAR PROFESSOR OWEN

(Continued from Page 1)

lustrate his address with ship models, materials, slides, and motion pictures of the America's Cup races. Following the lecture the Pratt Museum of ship models will be open for inspection.

"High Speed Motion Pictures" will be described by Professor Harold E. Edgerton of the electrical engineering department in the second of these experimental science talks on January 13. He will show striking motion pictures recorded in less than 1/100,000th of a second and will demonstrate some of the uses of the stroboscope and high speed camera.

Professor Gordon B. Wilkes will discuss the production and control of heat and cold by radiation on February 10, and Professor Robert J. Van de Graaff will conclude the series on March 10 with an address on the transmutation of atoms by means of high voltage bombardment.

SYSTEM MUST PROVIDE FOR ABLE KEY MEN

(Continued from Page 1)

the speaker, is whether the future will see the American government in the form of Fascism or whether we shall have, what he called, a co-operative commonwealth.

The big criticism which is always being made of the Socialist program is that it does not provide for the placing of key men of the country in powerful positions. Mr. Thomas's answer to this criticism is in the form of another question: "Does the present system of government accomplish that objective?"

Milking the Cow

He likened the present procedure in our economic society to the milking of a cow where the men in control of big corporations are furthering their own interests at the expense of the absentee owners. Although the present government of America is not of Fascist form in any sense of the word, Mr. Thomas sees a decided trend in that direction.

He pointed out the need of and advocated a new system under which all would work for the common good of society and under which each would be rewarded according to what he does.

"Who Are You With?"

Summing up our present predicament, Mr. Thomas said that the phrase "What are you doing?" in the sense of what is your occupation, has become "Who are you with?" He explained that the spread of corporations in this country has narrowed control of enterprises to a small group and that all others must lean on those few even though they own property and have interest in business.

Machinery properly controlled, according to the speaker, will provide for the needs and comforts of all the people in our country.

Open Forum Follows Talk

At the end of the hour, about ten minutes were set aside to ask questions of the speaker.

At the end of the meeting, which was sponsored by a new organization at the Institute, the League for Industrial Democracy, students had an opportunity to ask the speaker several questions.

The chairman of the meeting outlined the purpose and objectives of the Society which is just getting a start here and application blanks for admission were handed out to interested students.

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COLLOQUIA ON MOTORS WILL BE LED BY KONN

"Single-Phase Traction Motors"

will be the subject of a colloquium announced by the department of Electrical Engineering, for next Monday and Tuesday, Dec. 10 and 11. Felix Konn of the motor division, transportation engineering department of the General Electric company will lead.

The meeting is open to senior, junior honors and graduate students as well as members of the instructing staff of the department. Students attending are requested to attend both days in order to secure the maximum benefit. On Monday, the colloquium will be held from 3 to 5, and on Tuesday from 2 to 4.

WOMEN'S ASSOCIATION HOLDS MONTHLY TEA

The Technology Women's Association held its monthly meeting Friday, December 7, in the Emma Rogers Room. Mrs. Frederick T. Lord spoke on the work at the Whittier St. Health Foundation. Professor Frederick G. Keyes of the Chemistry department also spoke. A tour of the food and waster laboratories was made. After the meeting tea was served.

EDITORIAL

(Continued from Page 2)

offers a very tangible chance for students to acquire facility of oral presentation of ideas.

Largely influential in promoting this new activity was a group of last year's freshmen, who organized a freshman team and had three intercollegiate debates. The experience gained in those debates has enabled the group to form a varsity team.

There are two ways of supporting the debating society. One is to participate in the work of the team. The other is to show interest in the organization by attending the debates. If general apathy toward this activity prevails in the student body, Technology will lose a valuable asset in its cultural life.

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24 SOUNDING BALLOONS FOUND AFTER FLIGHTS

(Continued from Page 1)

The balloons, with instruments in tact, were discovered within a radius of 150 miles from Lambert Field Airport, where they were sent aloft on November 20 in an investigation of weather conditions in the stratosphere. The only one thus far received for study at Technology was found to have reached a height of approximately 65,000 feet above the earth.

The tests were carried out during active storm conditions and in accordance with weather forecasts made at the Institute in Cambridge and telegraphed to St. Louis. The balloons were equipped with sensitive instruments, weighing but a few ounces and encased in shock-absorbent frames, for automatically recording temperature, humidity, and atmospheric pressure.

Upon reaching the rarefied air of the stratosphere, the balloons expanded and finally burst, letting the instruments fall to earth. Each bore an identification label offering a reward for their safe return to Professor C. G. A. Rossby, director of the division of meteorology at the Institute. From these upper air observations meteorologists hope to determine, among other things, whether violent changes take place in the stratosphere during periods of changing temperature and at what approximate level the maximum cold occurs.

This is the second study of its kind to be carried out by Technology in a program of research calculated to greatly advance the science of accurate weather forecasting. The original tests were made in St. Louis last February with the release of 38 balloons, 36 of which were found and returned to the Institute's laboratories for study.

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