

REVISE PLANS FOR 2ND TRAINING CAMPS

On Account of Cantonment Construction, Number of Reserve Officers' Camps Will Be Nine Instead of Eight

ALTER SITES IN SOME CASES

A complete revision in the plans for locations of the second officers' training camps to open August 27 has been decided on by the war department as a result of a reinspection of the sites previously chosen.

Under the new arrangements there will be nine camps instead of eight, Fort McPherson, Ga., Fort Logan, H. Roots Ark., and Fort Riley, Kan., being dropped from the list, and Plattsburg barracks, New York, Fort Niagara, N. Y., Fort Snelling, Minn., and Fort Sheridan, Ill., added. The Fort Myers, Va., Fort Oglethorpe, Ga., Fort Benjamin Harrison, Ind., Presidio, San Francisco, and Leon Springs, Tex., designations remain unchanged, but a reassignment of state personnel among the various camps has been ordered.

"Some of the locations originally ordered are objectionable for various reasons," said a report on the subject transmitted to Secretary Baker by Adjt.-Gen. McCain. "Fort McPherson is already overcrowded and has poor facilities for training camp work. Fort Logan H. Roots is decidedly unsuitable and will be rendered more so in view of the large cantonment to be constructed at that place. Fort Riley, Jan., is objectionable because of the

(Continued on page 2)

LIST MEM IN SERVICE

Washington Bureau Issuing Roster of Men in War Work

From data furnished by the Washington office of the recently formed Committee on National Service a list of alumni and undergraduates in the army and navy will be run from time to time in this column. The names after running in The Tech will be listed under the respective branches of the service and published in pamphlet form as a Technology army and navy journal. Corrections to the lists or additions should be sent to the Washington bureau or to the office of The Tech.

Infantry.

H. A. Rapelye, '08, commissioned captain O. R. C. (infantry).

Ordnance.

A. B. Lawrence, '16, commissioned lieutenant.

A. L. Brown, '15, commissioned lieutenant O. R. C. (ordnance) 4 June, 1917.

Alfred E. B. Hall, '15, commissioned lieutenant O. R. C. (ordnance).

S. P. Houghton, '15, commissioned lieutenant O. R. C. (ordnance), 4 June, 1917.

Herbert S. Kimball, '11, commissioned captain O. R. C. (ordnance), 4 June, 1917.

N. M. Marsellius, '16, commissioned captain O. R. C. (ordnance), 4 June, 1917.

A. S. Morrison, '15, commissioned lieutenant O. R. C. (ordnance), 4 June, 1917.

P. G. Morrison, '16, commissioned lieutenant O. R. C. (ordnance), 4 June, 1917.

P. G. Morrison, '16, commissioned lieutenant O. R. C. (ordnance), 11 June, 1917.

G. R. Norton, '07, ordnance department U. S. A.

James L. Walsh, '07, major ordnance department U. S. A.

Course for machine gun instructors, Springfield armory:

Leon R. Abbott, '15.

B. G. Sedgwick, '16.

E. Barry, '16.

H. P. Claussen, '16.

R. A. Crosby, '16.

H. P. Dunham, '17.

C. H. Durkee, '15.

Carlton W. Eddy, '15.

K. E. Engstrom, '15.

G. H. Gans, '16.

H. Gfroever, '16.

Roster At American University

The American University is an advanced Plattsburg particularly for candidates for the Engineer Officers' Reserve. Out of the six companies at the "university" in Washington, fifty-seven are Institute men.

COMPANY 3

Name	Year	Active Duty	Not Active Duty
Bailey, F. W.	'96	First Lieutenant	
Bascom, E. D.	'15		Candidate
Bowler, E. W.	'14		Second Lieutenant
Bresth, Alexander	'16		Candidate
Brooks, E. P.	'17		Candidate
Brown, H. W.	'15		Candidate
Clark, W. A.	'05		Candidate
Cohen, Samson K.	'10	First Lieutenant	
Deacon, E. F.	'19		Candidate
Devlin, J. J.	'11		First Lieutenant
Dickinson, Thorn	'14		Candidate
Foley, John F.	'13		Candidate
French, H. W.	'08	First Lieutenant	
Gage, E. H.	'13		Candidate
Gay, G. E.	Spec.		Candidate
Gibbs, D. W.	'10		Candidate
Harper, J. H.	'17		Candidate
Hefler, R. E.	'15		Candidate
Keith, G. M.	'12		Second Lieutenant
Kelly, E. F.	'07		Candidate
Kingsbury, F. H.	'12	First Lieutenant	
Lane, K. M.	'17		Candidate
Lawton, R. M.	'03		Candidate
Lord, H. S.	'11	First Lieutenant	
Macomber, Alexander W.	'07	Captain	
Merrill, S. W.	'14		Candidate
Moore, L. E.	'02	Captain	
Pease, M. H.	'07		Candidate
Rhodes, W. S.	'95	First Lieutenant	
Root, John A.	'14		Candidate
Ryan, T. W., Jr.	'17		Candidate
Senter, E. G., Jr.	'17		Candidate
Shaw, A. L.	'09	Captain	
Smith, M. J.	'14		Second Lieutenant
Sutherland, C. H.	'11	First Lieutenant	
Ware, E. A.	'09		Candidate
Weaver, E. J.	'15		Candidate
Wilkins, C. H.	'14		Candidate
Wood, J. E.	'14		Second Lieutenant
Wyman, E. E.	'17		Candidate

COMPANY 4

Name	Year	Active Duty	Not Active Duty
Ahern, Frank L.	'14		Candidate
Clafin, William B.	'95		Candidate
King, Howarl L.	'15		Candidate
Thomas, Ralph L.	'13	First Lieutenant	
Walters, Lee D.	'13		Candidate
Wiggin, Thomas H.	'95	Captain	
Wood, Leonard P.	'01	Captain	

COMPANY 5

Name	Year	Active Duty	Not Active Duty
Ackerman, A. S.	'03	First Lieutenant	
Churchill, P. M.	'95	Captain	
Clarke, Thomas C.	'93	Captain	
Millis, Ralph	'16	Second Lieutenant	

COMPANY 6

Name	Year	Active Duty	Not Active Duty
Hobson, G. F.	'06	Captain	
Kane, I. P.	'10	Captain	
Lewis, R. W.	'11		First Lieutenant
McRae, H. C.	'07		First Lieutenant
Powell, P. R.	'08		First Lieutenant
Reimer, A. A.	'00	Captain	
Yreance, A. W.	'12	Second Lieutenant	

HARVARD TRAINING CORPS GOES INTO CAMP AT BARRE

Will Begin Fortnight's Target and Marching Practice

The members of the Harvard R. O. T. C. slept under canvas last night at their camp at Barre. More than 1100 men marched to the North Cambridge Station yesterday morning at 9.30 and proceeded to Barre in two special trains. They arrived shortly before noon and marched the three miles to the camp at the fair grounds, where they ate dinner in the two mess tents already erected.

After the meal the men pitched their tents. Capt. Winfield S. Overton, U. S. A., retired, directed the work and then gave the cadets their liberty for the rest of the day. The lectures and practical training start again today, the hours being from 6 in the morning to 4.15 in the afternoon, with the exception of Saturday. The French officers, who will arrive today, expect to devote considerable time to route marching and target practice.

Several of the cadets remained in Boston on furlough in order to take examinations at the Institute for commissions as second lieutenants in the regular army. They will join the corps later.

(Continued on page 2)

FIFTY NAVY FLIERS START TRAINING AT INSTITUTE SCHOOL

First Quota of Men For New Ground Course in Hydro-airplaning Arrive For Eight Weeks' Stay in Cambridge

AN EXPERIMENT FOR NAVY DEPARTMENT

Thirty of the fifty men forming the first allotment of navy men to take the new ground course for naval aviators recently established at Technology by the Navy department arrived at the Institute yesterday, while it is expected that the remaining men of the first quota will be housed in the temporary quarters on the top floor of building two by this evening. These men will form the first two squadrons of naval aviators, while more students for the school will follow at the rate of thirty-three a week.

The course for navy men starting yesterday morning will closely resemble the course now being given to the men training for officerships in the signal enlisted reserve of the United States army, and will differ only in that importance will be laid on the hydro-aeroplane rather than the machine designed to rise and alight on land. Life in the aviation schools is one of routine. For the first three weeks the men receive military drill from 5.30 o'clock in the morning until it is too dark to maneuver, the infantry work being broken occasionally by periods devoted to signaling and telegraphic code work. During the second period of the eight weeks' stay at the Institute, the flyers receive instruction in the theory of radio telegraphy, aerial navigation, gasoline engines, the art of dropping bombs from airplanes and in correcting the fire of artillery by observation from flying machines.

Although the army school at Technology is under the direct supervision of army officers, the instruction is given by Institute professors. The navy training unit will be run on the same plan.

Upon finishing their course at the Institute, the airmen will be sent to the navy flying school at Squantum for instruction in the actual handling of planes in the air, and after receiving their commissions and pilots licenses will be detailed to active duty. Whether the naval aviators will be sent to France to aid the Allies' flying corps or whether they will accompany the battle fleet of the United States Navy it has been impossible to determine.

The drawing rooms on the third floor of building two have been cleared of the paraphernalia used in teaching freshmen descriptive geometry and have been equipped with pipe bunks. The navy men will occupy these quarters temporarily, it being planned to move them as well as the cadets of the naval reserve and the signal corps flyers into the Walker Memorial when it opens on September first. No difficulty will be encountered in feeding the students at the new school, as the facilities at the Caf will permit the serving of twice the number now being cared for. The obstacles of seating the added number of diners will be overcome by suitably arranging the mess hours of the various schools. In September when the Walker Memorial opens, the dining rooms there will be large enough to serve at one time triple the number that can be handled in the cafeteria in building two.

The plan of establishing such a school for naval fliers was recommended recently to the Navy Department in Washington, and has been under consideration for the past two weeks. A week ago Saturday Secretary Daniels wrote President MacLaurin asking whether such a school could be established at the Institute. Without hesitation President MacLaurin sent an affirmative answer over the wires to Washington. Publicity was not given to the plan as there was a possibility that the scheme would be abandoned; but a concrete proposal followed from the Navy Department Tuesday morning which was accepted by President MacLaurin last week. The school at the Institute is the first of its kind to be established in the United States; and whether other schools of this character will be started at other colleges later

will depend on the success of the first unit at the Institute.

The fliers at Squantum have for the past few weeks been coming up from the flying school there to the Institute every few days for evening lectures given by Alexander Klemin, instructor in aeronautics at the Institute and technical editor of Aviation. It is probable that the success of these lectures was the cause for the recommendation of the technical school to the Navy Department.

According to the Navy Department applications may still be made for this branch of war service. Candidates should see Lieutenant McKitterick at the Institute or go direct to the Navy Aviation Headquarters, building four, Charlestown Navy Yard.

JOIN SERVICE BODIES

Form Central Alumni Organization for National Service

On Thursday, July 19, an important conference was held at the Washington office, a majority of each of the executive committees of the Mobilization Committee and the Technology Clubs associated committee being present. It was the unanimous opinion that the two committees be consolidated and that, so far as possible, the work be centered at Washington to which Technology men are coming in ever increasing number. It appearing, moreover, that Litchfield is likely to be engrossed in the important work of the National Service Reserve, and that Munroe is to be located for the present in Washington, it was decided to make some change in officers. As a result, the following votes were unanimously passed:

Whereas the work of these two Committees has been from the beginning supplementary;

Whereas both added strength and economy cannot but result from continuing the work in name as it has been conducted in fact, as a joint effort;

Whereas some misunderstanding has arisen among Institute men because of the existence of two Committees doing practically the same work; therefore

Voted; that the two Committees named above be merged in a single organization to be known as the M. I. T. Committee for National Service.

Voted; that all the activities heretofore carried on by the two Committees thus consolidated be assumed and continued by the new M. I. T. Committee for National Service.

Voted; that the Women's Auxiliary Committee of the Committee on the Mobilization of Technology's Resources and the Joint Committee on National Service (made up of members of the faculty and of the undergraduate body) be invited to associate themselves, without any loss of identity, with this M. I. T. Committee for National Service.

Voted; that M. R. Scharff, '09, continue as Executive Secretary of the Executive Committee thus constituted, and that the Chairman be empowered to secure a recent graduate to serve as Assistant Executive Secretary.

The Tech

Established 1881

Entered as second-class matter, September 16, 1911, at the Postoffice at Boston, Mass., under the act of Congress of March 3, 1879.

Published twice a week during the college year by students of the Massachusetts Institute of Technology.

MANAGING BOARD

- Paul C. Leonard, '17 Acting General Manager
- Kenneth Reid, '18..... Acting Editor-in-Chief
- Donald D. Way, '19..... Managing Editor
- Richard A. Wilkins, '18..... Acting Treasurer
- William Eastman, Jr., '18..... Acting Advertising Manager
- Augustus P. Farnsworth, '19..... Circulation Manager

Subscription \$1.50 for 53 issues, in advance. Single copies 3 cents. Subscriptions within the Boston Postal District or outside the United States must be accompanied by postage at the rate of one cent a copy. Issues mailed to all other points without extra charge.

News Offices, Charles River Road, Cambridge, Mass.; 152 Purchase Street, Boston, Mass. News Phones, Cambridge 2600, Main 3810. Business Offices, Charles River Road. Business Phone, Cambridge 2600.

Although communications may be published unsigned if so requested, the names of the writer must in every case be submitted to the editor. The Tech assumes no responsibility, however, for the facts as stated nor for the opinions expressed. The Editor-in-Chief is always responsible for the opinions expressed in the editorial columns, and the Managing Editor for the matter which appears in the news columns.

TUESDAY, JULY 24, 1917

SELECTION FOR THE DRAFT

ONE of the greatest revelations of the present war is the extent to which reliance for its actual conduct is placed not so much upon the man merely skilled in military manoeuvres as upon the man with the trained intellect. The fact that college training is the initial requirement of entry into many of the lines of war work is evidence of this condition.

Through the developments resultant from the revolution in Russia, and various local movements, it is rapidly becoming evident that order, harmony, and consistent growth are dependent upon control by a united action upon the part of those possessed of a certain amount of higher intellectual training.

It is essential that the future development of not only our country but the world at large be based upon the principle of control by intellectual and scientific expression, rather than upon the impulsive and spasmodic control of emotional self-expression. No government is stable whose enactments are subject to the uncertain and fluctuating wishes of mere temperamental or personal desire, whether such government parade under the name of "true democracy" or bare its real title, "mob rule."

To the end that the spirit of liberty and democracy now seizing the world be not diverted into the channels of self-centered interests, be they of capital or labor, party or person, it is essential that the man of trained intellect be not drawn indiscriminately into the army, only to leave a man far less capable than he to exert a greater power in the interest of the self centered propagandist.

The condition which is to prevail is yet to be revealed, but thus far the draft seems to have been thoroughly impartial in its selection of some of the best men training in our colleges and universities. It may be that the exemption boards are so constituted as to include in their personnel that type of men which is capable of recognizing the value of mere intellectual development. Our young college men may then be placed so that they may serve their country in the double capacity of war workers and active agents in the reconstruction of stable world conditions after the conflict.

The Institute has done and is doing all in its power to impress the necessity of the recognition of this fact upon those in charge of the draft, and it is indeed our earnest hope that those alumni who have anything to do with the work of selection keep in mind the fact that without a majority of those so trained that their reason is greater than their desire, and their power of analysis greater than their response to emotionalism or personal appeal, our country will face an immediate future of confusion and strife till such time as our schools and colleges can again establish the proper balance and control.

HARVARD MAY PLAY FOOTBALL

"The Harvard athletic committee and the university authorities are going to do their utmost next fall to encourage athletics," said Fred W. Moore, graduate manager of the Harvard Athletic Association, yesterday. "While we have cancelled our intercollegiate football schedule, that doesn't necessarily mean that we have given up the game entirely.

"If enough interest is shown by the undergraduates next fall a football team will be formed to meet nearby colleges informally. Out of a varsity squad of 54 and a freshman team of 31, all but four of them are engaged in some branch of military service. So if we are to have an eleven it may mean that the rule against allowing freshmen to play on varsity teams will be waived for the time being. I don't see where this will do college sports any harm at this time.

"We haven't cancelled our freshman football schedule, despite the printed re-

ports. If sufficient interest is shown, a freshman eleven will be placed on the field and its schedule played, providing a varsity team is not formed.

"Aside from informal games with Boston College, Amherst and other of our college neighbors, we figure that intramural contests might serve to keep the men in trim.

"We have one of the best athletic equipments in the country and it is a shame that it is not being used more. The military program of the university since May has taken up the time of the best part of our students, but even before that the coaches were not able to find even a handful of men to train.

"It is likely that many of our younger students will find time to go out for sports this year, and if this proves so we will not only stand a good chance of playing informal contests on the football field, but likewise meeting other teams in cross-country and soccer."

Coach Hugh Duffy, with the possible exception of Pooch Donovan, is the only Harvard coach under contract, and he

"We are advertised by our loving friends"

Prepare baby's food according to the Mellin's Food Method of Milk Modification




Send, today for our instructive book, "The Care and Feeding of Infants" also a Free Trial Bottle of Mellin's Food

Mellin's Food Company, Boston, Mass.

will report for fall practice in September. Percy D. Houghton, head coach; Leo H. Leary, field coach; Alfred Shrubbs of the cross-country team and Bill Haines, professional rowing coach, are the men whose contracts have expired, and they will not be renewed unless peace is declared before fall.

OUR OLIVE DRAB UNIFORM

(From the Textile World Journal) It is pointed out that the uniforms now worn by the regular army and the militia should not be designated as khaki. This word designates a color, is of East Indian origin, coming from the word khak, meaning dust. It is, therefore, a dust-colored cloth, originating in India. It was first worn by native British troops, and later by all British troops on campaign service. It was adopted by the United States government because of its serviceability and low visibility. About four years ago it was supplanted by the olive drab in both cotton and woolen. This color is supposed to have lower visibility than the khaki, which is lighter in color, and at the time of the change it was claimed to be easier to secure the dye with which to process the cloth. It is a fast vat dye and before the war was entirely imported.

REVISE PLAN FOR SECOND TRAINING CAMPS

(Continued from page 1)

scattering of the buildings devoted to the training camp; furthermore, it is to become a large cantonment.

The elimination of these three points as desirable training camp locations necessitates a change in the original plan. The plan recommended above is better suited to existing structures. No new construction is required. Men in training camps will be much less crowded than at present. The more northern points may experience unfavorable weather in November, but this is more than offset by the more favorable conditions that will exist during August, September and October.

The assignment of state quotas under the new plan follows: At Plattsburg—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York and congressional districts 10 to 28 inclusive of Pennsylvania.

At Fort Myer—New Jersey, Delaware, Maryland, District of Columbia and Virginia. At Fort Oglethorpe—North Carolina,

The Advantages We Offer

An efficient and courteous organization, progressive methods, large resources and three offices, conveniently located in different sections of Boston, combine to make the Old Colony Trust Company the most desirable depository in New England.

Capital and Surplus.....\$ 13,000,000

Total Deposits over..... 130,000,000

Old Colony Trust Company

52 TEMPLE PLACE 17 COURT STREET 222 BOYLSTON ST. BOSTON

SIMPLEX WIRES AND CABLES

NEW BUILDINGS OF

M. I. T.

WIRED WITH

SIMPLEX

SIMPLEX WIRE & CABLE CO

MANUFACTURERS

201 DEVONSHIRE ST. BOSTON CHICAGO SAN FRANCISCO

James W. Brine Co.

286 Devonshire Street BOSTON

Harvard Square CAMBRIDGE

ATHLETIC OUTFITTERS

and

MILITARY UNIFORMS

Regulation Army Shoes, Marching Sox, Flannel Shirts, Rubber Coats, Ponchos, etc. Special prices to M. I. T.

Phone, Fort Hill 730

South Carolina, Tennessee, Georgia, Alabama and Florida.

At Fort Benjamin Harrison—West Virginia, Ohio, Indiana and Kentucky.

At Fort Sheridan—Michigan, Wisconsin and Illinois.

At Leon Springs—Mississippi, Arkansas Louisiana, Texas, Oklahoma, New Mexico and Arizona.

At Fort Snelling—Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Missouri, Kansas and Colorado.

At the Presidio—Montana, Wyoming, Idaho, Washington, Oregon, Nevada, Utah and California.

LIST OF MEN IN SERVICE

(Continued from page 1)

George R. Wadsworth, '98, commissioned captain O. R. C. (signal).

Navy.

Bureau of Yards and Docks—Howard B. Luther, '08, junior inspector of construction.

Marine Corps.

John W. Wadleigh, '82, major U. S. M. C.

Henry J. Horn, '88, Red Cross commissioned to Russia.

Prof. George C. Whipple, Red Cross, commissioned to Russia.

C. E. A. Whislow, '98, Red Cross, commissioned to Russia.

Miscellaneous.

William C. Dart, '91, member of local examination board.

Bradley Dewey, '09, gas research, Washington.

William Green, '06, gas research, Washington.

George Ellery Hale, '90, chairman National Research Council.

Henry Howard, '89, director of recruiting, U. S. Shipping Board.

Prof. W. K. Lewis, '05, gas research, Washington.

George A. Richter, '13, gas research, Washington.

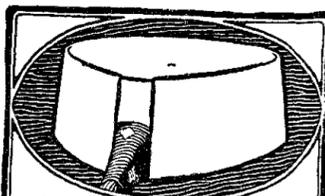
Raymond B. Price, '94, National Council of Defense.

Robert A. Boit & Co.

40 Kilby Street

Boston

INSURANCE OF ALL KINDS



Ashby-2 1/2 in. Lexicon-2 1/2 in.

ARROW COLLARS

GO WELL WITH BOW OR FOUR-IN-HAND 15 cts. each, 6 for 90 cts. CLUETT, PEABODY & CO. INC. MAKERS

Airplane Makers Profit In Face Of Experience Abroad

From facts supplied him by Major W. L. B. Rees of the British Mission, Waldemar Kaempffert, editor of the Popular Science Monthly, has written a review of the war progress of aviation which gives a graphic idea of the things which must be accomplished by American airplane builders in order to fulfill what Secretary of War Baker has called America's pledge to the Allies—to give them the unquestioned supremacy of the air for the rest of the war. Major Rees was sent to this country to give the officers of the American Army Aviation Service the benefit of British experience on European battlefields. Major Rees is an officer of the Royal Flying Corps and has brought down single-handed ten German fliers.

"The General Staff of every European army knew five years ago that the airplane would prove a potent factor in war. Germans, English, French, Italians, all had tried to evolve a system of air scouting in their annual manoeuvres." Mr. Kaempffert writes. "The Italian campaign against the Turks in Tripoli and the Balkan wars had proved clearly enough that a man in the air could see more than a man on horseback."

"And yet all the European Generals entered this war without even a dim realization of the terrible demands that would be made on the aircraft; on their utter dependence on a handful of dauntless men ready to vault into the air and brave not only the unseen whirlpools and maelstroms of a turbulent atmosphere, but bursting shells hurled from the ground and the machine gun fire of an ardent enemy air-fighter; of the inadequacy of the airplane as it was built before the fateful month of August, 1914, when all Europe was plunged into carnage; and of the frightful wastage of lives and machines."

Aircraft Highly Specialized

"Every army had machines—the French and Germans hundreds of them. But no one knew that airplanes would have to be built for very special military purposes; that the same machine could not be used for scouting and fighting; that the acrobatic performances of Pegoud and his imitators in 'looping the loop' and diving tail first would be elevated to the dignity of

military tactics with which every fighting airman would have to be familiar. In two years the whole art of airplane construction has been almost miraculously improved and the art of flying, too. Before the war some effort had been made to adapt the machine to the man; now the man must adapt himself to the machine."

Mr. Kaempffert points out that six machines have been evolved as the result of war experience:

1. The fighter—a 150-mile-an-hour single-seated airplane, armed with a machine gun; which has limited fuel capacity and which serves to find, fight and destroy the enemy.

2. The two-seated fighter, carrying a fixed machine gun at the front and another machine gun on an all-round mount for the observer in the rear. It is not as fast as the single-seated fighter. It fights the enemy, but also escorts fire control machines. It has more fuel capacity than the single-seated fighter and can stay up longer.

3. The reconnaissance machine is armed like the two-seated fighter; but it is not so fast, nor does it climb as rapidly. If it goes far it must be protected by faster machines.

4. The fire control airplane directs the batteries by means of wireless. A reconnaissance machine fitted with wireless may be used for fire control.

5. The bomb dropper resembles the two-seated fighter, although bombs can be carried by various machines. Bomb carriers are large.

6. Night fliers resemble either the reconnaissance machines or two-seated fighters.

Lesson from Cold Lead

"It was a very heterogeneous collection of machines that took the air at the outbreak of the war," writes Mr. Kaempffert, "monoplanes with tractor propellers, biplanes with both tractor and pusher propellers, machines with and without streamline bodies, fast racers and slow cross-country fliers. One would suppose that the military brains of Europe would have foreseen that some effort would be made to beat off a prying air scout. That it was foreseen the rather crude anti-aircraft artillery evolved before the war proves, but no one could foresee how combats at a height of ten and twenty thousand feet would be fought, or how a machine

should be designed for effective fighting. Manoeuvres in time of peace may teach much, but blank cartridges can never teach as much as cold lead.

"There was no air fighting in the Tripolitan and Balkan campaigns, but in this war there was air fighting almost from the beginning. At first rifles and pistols were used. They proved worthless. A machine gun alone could be used effectively, something that would squirt death like water from a hose. But the machine gun implied the building of an airplane able to mount and fire it. Now, it was soon found that the pusher type of airplane, which carries its propeller in the rear, is not so fast as the tractor, which carries its propeller in the front. It was also found that, for fighting at least, quick manoeuvring ability is highly essential, which implies a small, high-powered machine carrying only one man. Here was a very difficult technical problem to be solved: The fighting machine had to be a tractor for speed; the propeller in front necessarily interfered with the proper manipulation of the machine gun; the officer in the pilot's seat had not only to keep his machine on an even keel, but also to fight his gun.

Firing Through the Propeller

"Curiously enough, the problem of firing through the propeller had been solved before the war by some imaginative inventor with more vision than is given to academically trained Generals, and, curiously enough, it was solved in both France and Germany simultaneously. The solution was this: The gun was rigidly mounted in front of the pilot, and was mechanically coupled with the engine. A propeller revolves at about 1,200 revolutions a minute; a machine gun fires at the rate of 600 shots a minute. Let the engine fire the gun at just that fraction of a second when no propeller blade intervenes—that is the solution.

"Because the gun is rigidly mounted, the air fighter must turn the entire machine toward the German enemy to fire it. The enemy does the same, for the German Fokker, an adaptation of the French Moranne-Saulnier, is similarly designed and equipped with a fixed machine gun.

"When these fighters first appeared on the side of the Allies they drove everything before them. It was impossible for the slower Germans to cope with them. Then the Fokker appeared. The machines of the Allies were made still faster; the fighters became more skillful, more daring; fighting tactics were evolved. As a result, the Allies have not only caught up with each German improvement but have surpassed it. It is rarely that German machines—fighters or scouts—appear over the French and British lines, but the machines of the Allies are always over the German lines. That meant much at Arras.

"When these fast fighters first made their appearance there were some single-handed combats. A German and British chalteer of the air would wheel about, jockeying for a position in which, for a few fleeting seconds, either might pour in a hundred bullets at his enemy. It was a favorite manoeuvre of the German flier to rise very high, to plunge down on an adversary, and to fire as he came. But Boelke and Immelmann were about the only fliers on the German side who were either skillful or daring enough to engage in frequent single combats. As a rule, the Germans attacked a single British or French machine in twos or threes. The procedure may be attributed in part to the different temperaments of Germans and British and in part to military policy.

Move in Flocks, Like Birds.

"The result has been that fighting in the air is now undertaken, as a rule, only by squadrons. Six machines, sometimes more, constitute an aerial tactical unit. Their pilot officers live together, sleep together, eat together. They know one another better than if they were brothers. Every mental and emotional characteristic is bared. So it happens that in the air, when the six machines are flying side by side, the men know instinctively what they are to do. Have you not seen flocks of birds on the wing, circling about with a unanimity of understanding that makes it seem as if they were obeying a command? It is so with the air fighters of a squadron. They move as one, like a flock of birds, with never a word of instruction.

"An engagement between opposing squadrons in the air is not like a battle at sea—a fight between fleets. Around and around each other the planes whirl, each team following the leaders with clock-like precision and automaticity. The opposing squadrons watch and watch each other. Woe betide the man

who lags behind for a second, who manipulates his controls a little too carelessly; who is not quite en rapport with the teammate in the machine beside him! Two machines of the enemy swoop down. He is cut off from his fellows like a bird from a flock. He must fight now for his life. Up and down, in and out, he manoeuvres with his foes. He shoots when he can—when a hostile machine is directly in front of him. But enemies outnumber him. He cannot outmanoeuvre two machines. One, at least, must sooner or later swing around into a favorable position. Then there is a squirting of bullets. The machine drops, a mass of flames, three miles to the earth.

Fighting on Three Levels.

"Whenever that terrible artillery preparation takes place of which we read in the newspapers, the deadly hail of tons and tons of metal that precedes an attack with the bayonet, the fighting squadrons are high in the air—20,000 feet above the ground. Below them, at perhaps 10,000 feet, are the two-seated fighters and reconnaissance machines, each patrolling a section of the enemy's line, taking hundreds of photographs. And below, at 6000 feet, are the machines that control the artillery fire—machines that watch each shot as it falls, and that wireless back the signal 'too shore' or 'too long.' Without the reconnaissance officers the scouts and the fire controllers would not be able to perform their task; they would be attacked and annihilated by fast airplanes mounting machine guns. To be sure, they are armed themselves, so that they can keep up a running fight. But on the daring fighting squadrons far, far above the battle line, depends the fate of an army; on them depends the possibility of gathering the facts that the heavy artillery in the rear must have to fire at a mark ten miles distant.

"To the all-seeing eye in the air nothing is concealed. It is that eye which has made it utterly impossible for either side to execute a flank movement that would envelop a whole army and compel a surrender, that eye which has made it necessary for armies to burrow in the ground and face each other in a nerve-racking, soul-trying struggle."

The Tech Caf



Open Daily and Sunday
Until Further Notice



Hotel Lenox

An hotel which has the atmosphere of a college club.

Historic as a stopping place for University Athletic Teams.

Unusually attractive to college men—graduates or undergraduates.

Popular for its dances in the Rose Garden from 10 P. M. to 1 A. M. Saturdays 9 P. M. to 12 P. M.

L. C. Prior, Managing Director

Telephone, Winthrop 1544

FRANK COHEN

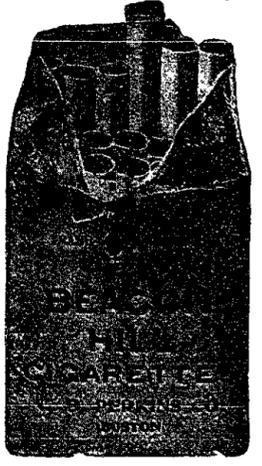
MILITARY TAILOR

FORT BANKS, WINTHROP, MASS.

Officers' Uniforms Reasonable Prices
a Specialty Best Quality Goods

The CIGARETTE

YOU have been looking for



A Wonderful Blend That Will Please You

20 for 20c
ASK YOUR DEALER

GINITA CIGARS

Mr. Advertiser:

Do you know that **THE TECH**, which is the official news organ of the Massachusetts Institute of Technology has now a guaranteed circulation of nearly **TEN THOUSAND?**

And, do you know that this number includes practically every man who ever went to Technology, a class of men more intelligent and more prosperous than any similar body in the country?

Mr. Advertiser, do you realize what this means to you as an opportunity to add to your clientele men unequalled in their buying power and in their ability to appreciate your wares?

The news circulated by **THE TECH** is largely news of National Service being rendered in the present crisis by Technology men. It is vitally interesting and vitally important to readers.

It Will Be Read. You, sir, know the value of that. Let us make you acquainted with the attractive details of our proposition. Remember—Twice a week we reach Ten Thousand Technology business men.

PLEASE ADDRESS YOUR INQUIRY TO
ADVERTISING MANAGER,
THE TECH, CHARLES RIVER ROAD,
CAMBRIDGE, MASS.

TRY

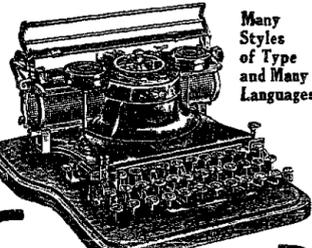
Rupert Lunch

For Good, Wholesome Food

NEAR THE M. I. T. DORMS

Tel. Camb. 25277

Discount on Meal Tickets



Many Styles of Type and Many Languages

A Typewriter Exceptional

For Collegians
Change your type in an instant from one style to another—or any language.

THE MULTIPLEX HAMMOND

Two sets of type in each machine. "Just Turn the Knob" Presto one or the other Simple—Compact—Portable

Beautiful work—beyond compare. If not inclined to a new machine, inquire for our **Factory Rebuilds.**

We Rent Machines of high quality.

Patrons: President Woodrow Wilson
Cardinal Merry del Val
Dr. Alexander Graham Bell
Chancellor Rev. B. G. Trant
Bishop John G. Murray
William Dean Howells

also all Colleges and Universities

Our special terms to collegians will interest you. Catalog for the asking.

Hammond Typewriter Co.

545 East 69th Street
New York City, N. Y.

U. S. NEEDS TECHNICAL MEN FOR SERVICE DURING WAR

WASHINGTON

JULY 23, 1917

Position	Service	Salary	Date of Exam	Cir. No.
Laboratory Aid.	Dept. Agriculture	\$720	August 8	1598
Motion Picture Lab.	Quartermaster	\$1,200	-----	1599
Tent Inspector	Dept. Navy	\$5.52 per day	-----	1600
Ordnance Foreman	Paget Sound Navy Yard	\$540	August 22	1597
Shop Apprentice	Dept. Commerce	\$960-\$1,500	-----	1370
Asst. Insp. Cloth Equipment	Ordnance	\$1,200-\$1,500	-----	1370
Asst. Insp. Leather	Ordnance	\$960-\$1,500	-----	1370
Asst. Insp. Small Hardware	Ordnance	\$960-\$1,500	-----	1370
Asst. Insp. Textiles	Ordnance	\$1,200-\$1,500	-----	1370
Asst. Insp. Leather Equipment	Ordnance	\$1,200-\$1,500	-----	1370



STONE & WEBSTER

FINANCE public utility developments.

BUY AND SELL securities.

DESIGN steam power stations, hydro-electric developments, transmission lines, city and interurban railways, gas plants, industrial plants and buildings.

CONSTRUCT either from our own designs or from designs of other engineers or architects.

REPORT on public utility properties, proposed extensions or new projects.

MANAGE railway, light, power and gas companies.

NEW YORK BOSTON CHICAGO

BEMIS BRO. BAG CO.

Established 1858

Cloth and Paper Sacks

Boston Office: 40 CENTRAL STREET

OPERATING PLANTS AT

St. Louis	Memphis
Minneapolis	San Francisco
Indianapolis	Seattle
Kansas City	Winnipeg
Omaha	Peotia
New Orleans	Bemis, Tenn.

A. F. Bemis, '93	F. H. Boynton, '15
G. R. Wadleigh, '97	A. H. Clarke, '15
D. Belcher, '09	H. P. Claussen, '16
P. E. Morrill, '14	J. R. Hunneman, '16
Allen Abrams, '15	T. W. Little, '16

ANGUS JUTE CO., LTD., CALCUTTA, INDIA

A. F. Bemis, '93	H. G. Morse, '16
H. W. Waterfall, '11	W. L. Ogden, '16
P. McCulloch, '14	P. W. Rowe, '17

ALUMNI NOTES

Washington Correspondence
By Maurice R. Scharrif
Executive Secretary, Technology Clubs
Associated
908 Union Trust Bldg.
(Washington Correspondence)

Aug. 23, 1917.

It is expected that a new course for machine gun instruction will commence at the Springfield Armory August 1st. The appointments are by no means limited to mechanical engineers, and the work has been found very satisfactory by the men in the first course. The pay is between \$4 and \$5 a day at the start.

Paul H. Taylor, '14, has a lieutenant's commission and is connected with the Bureau of Ordnance, War Department, Washington. He is in the artillery section.

Archie Morrison, '15, is connected with the inspection work, Bureau of Ordnance, War Department, and is located in the Old Land Office building, Washington.

Callers at the office: B. V. James, '08, XIII. in connection with aviation; D. W. Roby, '07, I. Valuation Dept., S. A. L. Ry., Norfolk, Va.

Joseph P. Catlin, K. C. Klipstein, Howard L. (Pa) Coburn, '87; Alexander H. Twombly, '87, and Albert W. Hemphill, '06, of 50 Church St., New York, called to make known their need of young civil and sanitary engineers. They have been awarded the contract for the entire engineering of the National Guard Camp at Hattiesburg, Miss.

The U. S. Public Health Service, acting as director for health administration of Red Cross work in the zones outside cantonments, desires a list of sanitarians and sanitary engineers who would be available for this service. A certain number of laboratory experts will be required. Pay will be about average. Men in the last half dozen classes preferred,—with a few older men. Women graduates are acceptable for laboratory positions. Send names to I. W. Litchfield, 908 Union Trust Bldg., Washington.

Men capable of acting as inspectors of leather, leather equipment, textiles, cloth equipment and small hardware, are wanted by the Ordnance Department. The rating is lieutenant and captain O. R. C. Make application through Intercollegiate Intelligence Bureau, Munsey Bldg., Washington.

The Bureau of Standards has asked for a list of men to work on aeronautic instruments. There are not now any positions open, but an expansion is looked for within a few months. The salaries are not large. Both seniors and juniors will be needed. Apply to I. W. Litchfield, 908 Union Trust Bldg., Washington.

The Ordnance Department requires men 25 to 32 years old with four to five years' experience with machine tools and machine shop practice; desirable to have had practice in preparation of design. Duties in Washington—studying design and modification of field artillery material. Send application to Intercollegiate Intelligence Bureau, Munsey Bldg., referring to serial call No. 24.

"The establishment of a sea-service bureau, with Henry Howard, director of recruiting, in charge, is announced by the Shipping Board. The object of the new agency is to arrange positions for men graduated from the navigation and engineering schools recently established by the board. Its headquarters will be in Boston."

"These schools have been started at various colleges with the object of training men who have had experience as either engineers or seamen to be officers of the merchant marine. The first class was recently graduated."

Following is a sample of the letters that are being received in great numbers at the Washington office:

Podolsk, Moscow Government, Russia.

May 31, 1917.

Preparedness Committee,
Mass. Institute of Technology,
Cambridge, Mass., U. S. A.

Gentlemen:

The War-Time Tech

TECHNOLOGY itself is giving remarkably effective war service to the Country.

THE ALUMNI in large and rapidly increasing numbers are in government or industrial work essential to war success.

THE UNDERGRADUATES are efficiently fitting themselves for similar patriotic duty.

TECHNOLOGY WOMEN are organizing to provide for men at the front and to co-operate with wives and mothers left behind.

Already Institute men are in EUROPE, and Lansingh '98 is on his way to open a Technology centre in Paris.

The thousands of Technology men and the hundreds of thousands interested in the Institute should have news of all this and should have it promptly.

THEREFORE the undersigned have co-operated to render this news service by making THE TECH the organ of ALL TECHNOLOGY for the period of the war.

THE WAR TECH WILL GIVE:

NEWS straight from the live Alumni centre at Washington, in the heart of things.

NEWS from the fifty local Technology Associations all over the Country.

NEWS from the Technology centre in Paris, in touch with all those at the front.

NEWS from the Summer Camp, from Plattsburg and from all other training camps where Institute men may be.

NEWS of the varied activities of the Institute itself and of its teaching staff.

NEWS TWICE A WEEK, fresh, condensed, accurate, vital to every man and woman closely or remotely allied with Technology.

NO TECHNOLOGY MAN CAN AFFORD NOT TO SUBSCRIBE.

Six months (52 issues) for \$1.50; anywhere in the United States.

For their own sakes and to stand behind the great drive to put all the resources of Technology behind the United States and her Allies, we urge every Institute man to subscribe.

M. I. T. ALUMNI ASSOCIATION
Francis R. Hart '89, President.
Walter Humphreys '97, Secretary.

MOBILIZATION COMMITTEE
Isaac W. Litchfield '85, Chairman.
James P. Munroe '82, Treasurer.

TECHNOLOGY CLUBS ASSOCIATED
Hollis Godfrey '98, President.
F. A. Smythe '89, Treasurer.

ASSOCIATED COMMITTEE OF WOMEN
Edith P. Cunningham (Mrs. Edward), Chairman.

THE TECH
Paul C. Leonard '17, General Manager.
Kenneth Reid '18, Editor-in-Chief.

1802

1917

The Significance of



The Du Pont Oval is Our Trade Mark

It is emblematic of an honest product, guaranteed by us to be as represented—the best we know how to make for its purpose and at the price.

For 115 years the policy of this business has been to get and hold customers by giving them full value for their money.

This policy continues. It applies to every article we make and sell. If any article, bearing our trade mark, or that of any concern mentioned below, is offered to you, it may be bought with full confidence that it is sold in good faith as being **right**, and that if through human fallibility, it should prove **not right**, we seek the chance to make good.

This Policy Is Ours, Not Merely for Moral Reasons but Because It Is Good Business

We value the customer far more than the transaction. We want you to know this, especially at this time, because our line of products is broadening and one or more of them must inevitably come before you. Already we are making and selling 250 different commodities, some of which are salable in every home or business.

We ask your full confidence and your continued patronage.

E. I. du Pont de Nemours & Co.

Established 1802

Wilmington, Del.

Du Pont Fabrikoid Co. The Du Pont Chemical Works The Arlington Co.
Wilmington, Del. New York, N. Y. New York, N. Y.
Toronto, Ont. Toronto, Ont.

Harrisons, Inc., Phila.



I am today in receipt of No. 9, Vol. XVIII of the "Technology Review." The fourth item in the tentative report of your committee moves me to write to you and offer my services.

I have been personally in charge of the manufacture of a considerable variety of munitions since the very start of the war. I have been through the preliminary stages of indefinite specifications, lack of dimensions and working limits, the difficulties of interchangeability when the several parts of a given unit are produced in different factories, and the reorganization troubles caused by changing over from one product to another.

I have been a member of advisory committees charged with the task of planning and getting into operation new factories. I have designed and superintended the manufacture of many thousands of gauges for other manufacturers. I am busy and useful here, but America has first call on my services if they are wanted and needed.

According to the journal of the A. S. M. E., a number of prominent engineers are being appointed for army reserve engineer officers. If any engineers are sent here, they should by all means have army appointments and travel in uniform.

Make any use of this letter you see fit. I am at my country's service in Russia or in the United States wherever I may be of most use. It has occurred to me that my knowledge of Russia and Russian might be of some use to some of the Commissions that I understand have been appointed and are to be appointed to visit Russia.

Yours very truly,
(Signed) G. W. THOMAS, M. I. T., '05
Care The Singer Company,
Podolsk,
Moscow Government, Russia

A. SHUMAN & CO.

Clothiers and Outfitters

For MEN, WOMEN and CHILDREN

"MADE IN NEW ENGLAND"

Ashuman & Co.
Boston
Shuman Corner
THE SERVICE STORE.

At the first meeting held Saturday, of the Federal Board for Vocational Education, all the members were present and much important business was transacted. Secretary Houston, ranking Cabinet member of the Board, was elected chairman, and James P. Munroe, '82, vice-chairman. Mr. Munroe will spend the greater part of his time during the coming year in Washington.