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The Wisconsin Engineer

VOL. XXII MAY, 1918 NO. 8

HAVE THE WISCONSIN ENGINEER FOLLOW YOU

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BUILDING COSTS OVER A 65-YEAR PERIOD AT THE UNIVERSITY OF WISCONSIN

ARTHUR PEABODY
State Architect of Wisconsin

The compilation of building costs covering the period from 1850 to 1916 has elements of great interest, and, like other statistical material, will be useful when rightly applied.

In a general way, the cost of construction today is about three times as great as it was three-quarters of a century ago. Not all of this difference is due to increase in the cost of labor and materials. To form an accurate picture of conditions it would be necessary to strip away from modern buildings whatever was not in use at that time. If it were possible to do this, the surprising result might be found that building today is less expensive than it was a considerable time ago. In other words, to construct a building exactly similar to one erected seventy-five years ago might cost even less today than what was expended for it at the time. Machine work, which has produced an increased volume of articles of every sort with an accompanying decrease in cost, has led to a greater use of everything. Inventions have added to the number of appliances and have led to a betterment of the materials that go into building construction, so that increased value as well as increased cost has been the final result.

Building materials in 1850 included stone and brick work, woodwork, plastering, painting and glass, and a small amount of iron work. In 1914 the list had been enlarged to cover additional items such as concrete construction,—including crushed stone, sand, portland cement and incidental wood forms—terra cotta, structural steel, hollow tile, metal lath, asphalt, and mosaic.

There has been a greatly increased use of brass, bronze, and copper, and such innovations as counter-balanced sash, hardwood finish and flcorings, enamel, paint, modern stains, and varnishes. Add to this the entire equipment of plumbing apparatus with the cast iron sewers, galvanized wrought iron pipe, and the numerous and luxurious fixtures such as closets, tubs, bowls, and shower baths formed of china or of enamelled iron, surrounded by marble wainscots and floors and furnished with nickel-plated valves, traps and other trimmings. The entire system of water supply, waste and ventilation, hot water distribution, refrigeration, fuel and lighting gas service, and the heating of an entire building from a central point by means of boilers, pipes and radiators together with the recently perfected apparatus for temperature control, constitute other additions to building practice. Beside this there are the electric installations for lighting and power. These installations consist of rubber covered copper wires enclosed in iron pipes; switches, great and small, installed in metal cabinets; and fuses and other safety devices. Telephones,—including wiring and central stations,—vacuum cleaner service, and mail chutes are recent additions to the accepted equipment of buildings. Elevators for passenger and freight service constitute another important addition.

When these and other utilitarian items are considered, as well as the constant tendency toward betterment in architectural design and ornament, the wonder is not that building costs so much today, but how it can be done for the money.

In comparing costs per cubic foot of buildings old and new, located on the campus of The University of Wisconsin, the rather simple conditions and requirements surrounding the older buildings at the time of erection should be kept in mind.

The original university, as designed by the architect, consisted of five buildings, three of which were erected. Of these, North and South Halls, first used as dormitories but later changed over into class room buildings, remain substantially as designed, except as modern appliances have been added from time to time. The amount shown in the following tabulation is the original cost. The plans of North Hall bear the signature of John F. Rague and the date 1849. It is believed that he de-

signed also South Hall and Main Hall, then a square building with a central cupola. These buildings were completed by 1857, after which, for fourteen years, no others were added. They were constructed of local stone, the walls being of rubble masonry with a facing of ashlar. The floors, roof, and partitions were of timber.

University Hall, or Main hall as above, has been extended from time to time until at the present time it is one of the larger buildings of the University. A south wing was constructed in 1895 by Ferry and Clas, architects, who also rebuilt the front portico and replaced the previous cupola by a dome. In 1906 a north wing was added by the writer. The burning of the dome in 1916, gave opportunity for a more adequate treatment of the central portion, which, according to present day standards, should be made fireproof. A reasonable architectural treatment should be given also to this central feature of a group of buildings which represents one of this country's leading institutions of learning.

The buildings erected between 1871 and 1887 followed the general practice of construction employed in the older buildings. The personal touch of the first designer, however, was undoubtedly superior to that which followed. From a simple and dignified Italian Renaissance, there was a change to a debased Victorian Gothic, seen at its best in Music Hall and at its worst in the Chemical Engineering Building.

In 1888, following the burning of the old Science Hall, the influence of the Richardsonian Romanesque was shown in the outlines of the new Science Hall. This building was a departure from all previous ones. The use of fireproof construction and steel and hollow tile in this building, was one of the first, if not the first example of the use of these materials in modern public buildings. Like all pioneer efforts, it was followed by a reversion to type in the buildings immediately following.

The only other fireproof building erected on the campus up to 1906 was the State Historical Library, also of structural steel and hollow tile, with a facing of Bedford stone.

Had the use of Madison sandstone been continued in the Chemical Engineering Building, Chemistry Building, Science Hall and Law Building, greater unity would have been con-

served. Especially the deep red brick of Science Hall breaks the harmony of the principal university group. The style of the State Historical Library demanded a stone of different character from Madison sandstone, but its cool grey color does not seriously combat the prevailing tint of the other buildings.

In 1906, a general color scheme was adopted for all university buildings. Madison sandstone, which was selected for the principal group, was too costly for buildings of minor importance. Therefore a buff vitreous brick, very close to the sandstone in color, was selected for buildings located near the principal group, and for those farther removed a brown brick of low cost was chosen.

As to architectural treatment, a return to the Italian Renaissance was fixed upon. The other important change was the use of concrete for floors and of fireproof materials for the remaining parts of the structure, thus eliminating, to a considerable extent, the danger of fire. All principal buildings erected between 1906 and the present are of this character, wood being used very sparingly except in barns and other farm buildings of low cost.

Some comparisons of cost as between fireproof and non-fireproof buildings are interesting, as they tend to show a decrease in actual cost, if the greatly enhanced value of the buildings erected is taken into consideration.

The following buildings are of ordinary construction, having masonry walls, and wooden floors and partitions:

Chadbourne Hall	1871–1896	Stone	$135,000	17.4 c. f.
Dairy Building	1892	Brick	40,000	13.3 c. f.
Soils Physics Building	1894	Brick	37,000	15. c. f.
South Wing University Hall	1895	Stone	65,000	12.5 c. f.
Engineering Building	1901	Brick	100,000	13.4 c. f.
Agricultural Hall	1902	Brick	150,000	14.8 c. f.
Main Chemistry Building	1905	Com. Brick, Very plain	116,000	8.2 c. f.
North Wing University Hall	1906	Stone	74,200	14.3 c. f.
Average of eight buildings				13.6 c. f.

It will be noted that of these buildings the most recently built are the higher in price. The cost of the main Engineering Building in the above list is quite close to that of the wing, in

the following list. The main Chemistry Building was built with sand-lime brick walls except on a small part of the front. The wing is of pressed brick with Bedford stone trimmings.

The following buildings have masonry walls, concrete floors, and tile partitions:

Agronomy Building	1906	Brick	$27,760	14.3	c. f.
Agricultural Engineering	1906	Brick	41,640	14.8	c. f.
Central Heating Station	1908	Brick	105,000	10.38	c. f.
Forest Products Laboratory	1909	Brick	50,000	8.5	c. f.
Lathrop Hall	1909	Stone	190,000	13.	c. f.
Dairy Laboratory	1909	Brick	20,000	11.	c. f.
Biology Building	1910	Stone	200,000	16.7	c. f.
Wing on Engineering Bldg.	1910	Brick	37,683	13.6	c. f.
Horticultural Building	1910	Brick	50,000	15.4	c. f.
Wing on Chemistry Building	1912	Brick	72,150	13.2	c. f.
Home Economics Building	1912	Stone	119,000	15.9	c. f.
Barnard Hall	1912	Stone	123,500	19.07	c. f.
Wisconsin High School	1913	Brick	118,298	13.15	c. f.
Agricultural Chemistry Bldg.	1913	Brick	83,363	12.66	c. f.
Physics Building	1915	Brick	190,000	13.3	c. f.
Soils Building	1915	Brick	56,000	15.9	c. f.
Average of sixteen buildings				13.75	c. f.

Cubical Contents and Cost of Construction of Buildings, University of Wisconsin.

Date	Building	Architect	Cubic feet gross	Cost of Const. dollars	Cts. per cu. ft.
1851	North Hall	John F. Rague	331,655	20,000	6.
1855	South Hall	John F. Rague	331,650	21,000	6.4
1855	Residence of Director of Observatory		110,000	5,000	4.5
1857	University Hall (For wings see below)	John F. Rague	682,500	63,200	9.3
	Total for First Period			109,200	
1871	Chadbourne Hall (Women's Dormitory) (For addns. see below)	G. P. Randall	454,950	70,000	15.2
1875	Old Science Hall (Burned 1884)	D. R. Jones	1,452,306	120,000	8.2
1878	Washburn Observatory	D. R. Jones	236,250	43,000	17.7
1879	Music Hall (Formerly University Library)	D. R. Jones	780,000	40,000	5.1
1880	President's House	Allen	130,378	12,000	9.2
1880	Student Observatory	D. R. Jones	7,980	800	10.
1887	Chemical Engineering Bldg. (Old Chemistry Bldg.)	A. C. Koch & Co.	450,000	65,000	14.4
1887	Mining Engineering Lab. (Old Heating Station)	A. C. Koch & Co.	245,700	25,000	10.2
1887	Engineering Labs.	A. C. Koch & Co.	865,125	45,000	5.2
1888	Science Hall	A. C. Koch & Co.	1,751,310	285,000	16.3
1892	Dairy Building (Hiram Smith Hall)	Ferry and Clas	300,000	40,000	13.3
1893	Law Building	Chas. S. Frost	401,625	87,000	21.6
1894	Soils Physics (Old Agric. Hall) (For addns. see below)	J. T. W. Jennings	123,750	18,500	15.
1894	Green House		37,500	6,000	16.
1894	Gymnasium and Armory (For addns. see below)	Conover and Porter	1,640,500	130,000	7.8
1895	South Wing University Hall	Ferry and Clas	518,320	65,000	12.5
1896	Pump House		14,375	2,000	14.
1896	Addn. to Chadbourne	Ferry and Clas	320,310	65,774	20.5
1896	Addn. to Soils Physics Building	J. T. W. Jennings	123,750	18,500	15.
1896	Grand Stand	J. T. W. Jennings	277,760	4,500	1.6
1897	Residence Dean of Agriculture	Conover and Porter	92,400	10,000	10.8

1897	Dairy Barn	J. T. W. Jennings	603,900	20,000	3.3
1900	Farm Dormitory		51,600	2,400	4.6
1900	Residence Farm Supt.		50,400	2,400	4.7
1900	Horse Barn	J. T. W. Jennings	301,600	12,000	4.
1900	State Hist. Library (For addns. see below)	Ferry and Clas	1,410,000	750,000	53.1
1901	Agric. Heating Station	J. T. W. Jennings	162,500	37,000	16.
1901	Engineering Bldg. (For Wing see below)	J. T. W. Jennings	746,144	100,000	13.4
1902	Agric. Hall and Auditorium (For addn. see below)	J. T. W. Jennings	1,041,000	150,000	14.8
1903	Tank House	J. T. W. Jennings	49,920	3,000	6.
1903	Hog Barn	J. T. W. Jennings	150,000	6,000	4.
1903	Boat House		236,250	5,000	2.1
1905	Chemistry Bldg. (For addn. see below)	J. T. W. Jennings	1,420,400	116,000	8.2
	Total for Second			2,356,874	
1906	Agronomy Building	Arthur Peabody	193,536	27,760	14.3
1906	North Wing University Hall	Arthur Peabody	518,320	74,200	14.3
1906	Hydraulics Laboratory	Arthur Peabody	211,680	28,400	13.5
1906	Agric. Engineering Bldg.	Arthur Peabody	345,000	41,640	12.
1906	Administration Bldg	Arthur Peabody	93,450	17,000	18.
1907	Tobacco Barn	Arthur Peabody	36,000	1,000	2.8
1908	Tunnels			93,840	----
1908	Stock Pavilion	Arthur Peabody	1,260,000	75,000	6.5
1908	Central Heating Station	Arthur Peabody	1,011,500	105,000	10.3
	Conveyors, Boilers, etc			110,400	----
1909	Dairy Laboratory	Arthur Peabody	144,377	20,000	11.
1909	Lathrop Hall (Women's Gymnasium)	Arthur Peabody	1,476,000	190,000	13.
1909	Litter Shed	Arthur Peabody	58,320	1,426	2.4
1909	Forest Products Lab.	Arthur Peabody	573,600	50,000	8.5
1909	Lincoln Statue Base (For completion see below)	Albert R. Ross	492	1,500	30.5
1910	Horticultural Building	Arthur Peabody	325,632	50,000	15.4
1910	Horticultural Green House and Potting House	Arthur Peabody	169,464	17,500	10.1
1910	Poultry House	Arthur Peabody	50,400	4,500	8.9

Cubical Contents and Cost of Construction of Buildings, University of Wisconsin—Continued.

Date	Building	Architect	Cubic feet gross	Cost of Const. dollars	Cts. per cu. ft.
1910	Wagon Shed	Arthur Peabody	54,198	1,500	2.8
1910	Hill Farm Barn	Arthur Peabody	72,000	5,000	6.9
1910	Sheep Barn	Arthur Peabody	100,100	5,377	5.3
1910	Crematory (Now Serum Laboratory)	Arthur Peabody	17,100	2,000	11.7
1910	Implement Shed	Arthur Peabody	45,198	929	2.
1910	Engineering Wing	Arthur Peabody	277,038	37,683	13.6
1910	Gas. Prod. Laboratory	Arthur Peabody	24,780	2,000	8.
1910	Biology Bldg. and Auditorium	Arthur Peabody	1,198,450	200,000	16.7
1910	Cornelius House (Alumni Headquarters)		47,600	3,000	6.4
1911	Gymnasium Annex	Arthur Peabody	309,112	15,000	4.85
1911	Service Building	Arthur Peabody	297,375	25,000	8.4
1912	Addn. to Hort. Greenhouse	Arthur Peabody	------	1,700	
1912	Electric Light Plant (In Central Heating Sta.)	Arthur Peabody	------	20,200	
1912	West Wing Chemistry Bldg.	Arthur Peabody	545,232	72,150	13.2
1912	Clinical Bldg. (Old Part)	Arthur Peabody	59,120	12,900	----
1912	Clinical Bldg. (New Part)	Arthur Peabody	61,200	12,100	19.8
1912	Barnard Hall (Women's Dormitory)	Arthur Peabody	647,683	123,500	19.07
1912	Home Economics and University Extension	Arthur Peabody	746,232	119,000	15.9
1912	N. W. Wing State Historical Library	Arthur Peabody	281,580	61,260	21.8
1913	Agric. Chemistry Bldg.	Arthur Peabody	658,249	83,363	12.66
1913	Serum Laboratory	Arthur Peabody	44,576	2,083	4.6
1913	Hog Barn	Arthur Peabody	50,000	3,882	7.7
1913	Applied Arts Laboratory (Olin Barn) for addn. see below	Arthur Peabody	------	1,000	----
1913	Central Kitchen	Arthur Peabody	102,930	13,710	13.33
1913	Wisconsin High School	Arthur Peabody	899,828	118,298	13.15
1913	Addn. to Agric. Lib.	Arthur Peabody	29,203	5,462	18.7
1914	Hog Barn	Arthur Peabody	24,480	1,638	6.6
1915	Experimental Breeding Barn	Arthur Peabody	60,684	3,000	5.
1915	Hog Cholera Serum Plant (Inc. Equipment)	Arthur Peabody	36,864	4,810	13.

1915	Reservoir at Hydraulics Laboratory	Arthur Peabody	42,474	5,200	12.25
1915	Automobile Shelter	Arthur Peabody	8,640	600	5.8
1915	Applied Arts Laboratory	Arthur Peabody	4,334	3,500	8.0
1916	Physics Building (also Commerce and Economics)	Arthur Peabody	1,323,012	180,775	13.3
1916	Soils Physics Building	Arthur Peabody	333,843	49,249	15.9
1916	Completion of base of Lincoln Statue	Albert R. Ross	22,123	9,000	40.7
	Total for Third Period			2,115,035	
	Grand Total			4,581,109	

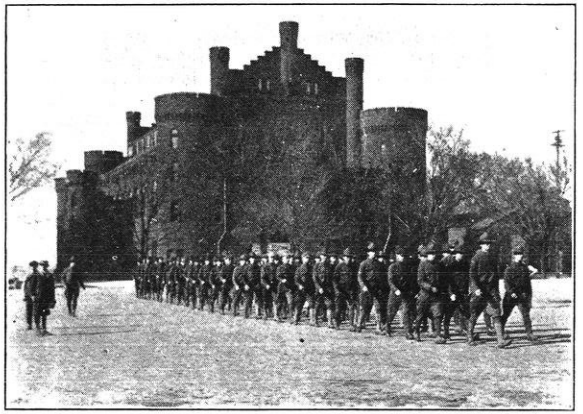

Photo by G. B. Kuebler '20

Soldiers of the Vocational School

HOUSING AS A WAR PROBLEM*

LEONARD S. SMITH, c '90; C. E. '95
Professor of Topographic and Highway Engineering

What enormous sum would the president and his advisers be willing to pay—what number of billions could the nation afford to pay—if our present rate of manufacturing ships and munitions of war could be increased, by some magic influence, 60 to 100 per cent? We learn from excellent authority that many of our war plants are working at an efficiency of only 40 per cent, and some at even less, due to lack of sufficient and decent housing for the workmen. Mr. Phillip Hess, chairman of the housing committee, Council of the National Defence, says of a certain government plant at Bridgeport that cost the government $2,500,000 and was ready to begin work January first of this year: "Not another man can be taken care of in the city of Bridgeport. They are coming in there in the morning and going out in the evening without unpacking their kits. Those who come in late have to sleep where they can on the floor and go out next day." This condition is true in spite of the fact that in the past three years Bridgeport has constructed 5,000 workmen's homes. Since new houses must be built, it will be many precious months before the wheels of that factory can turn, and similar conditions are true at numerous other places.

We have been told that men, materials, ships, and food will win the war; but one important factor was overlooked. Now we are rudely awakened to the fact that American workmen must have homes in which to live, and that the wheels of factories and ship yards cannot turn until the homes are built. Is it any wonder that the federal government has at last awakened to the overwhelming importance of housing workmen? It is this great deficiency which has largely changed our ship building program from 11 million tons as first announced to 6 million and perhaps again today to 4 million. Yes, real men, real munitions, and real ships will win the war; but not those on paper, —only those on water. It is not enough that the government

*Read before the Third Commercial and Industrial Congress, Madison, Wis., Feb. 21, 1918.

shall let enormous contracts and advance billions on factories; this money must be spent wisely and in proper sequence. The primal need of all our war plants,—workmen's homes, has been left to chance. As well could we omit housing for soldiers in cantonments as housing for our workmen.

Not only has the government made no provision for housing the enormous number of its new workmen called from distant city, camp, and farm, but we now find that such housing as the cities have offered workmen in the past are in large part too wretched and crowded for use. The effect of the sudden expansion of manufacturing plants has been to add greatly to the land and house crowding until the conditions at the present time may be described as unbearable to the workmen and alarming to the government.

The delay of our government in handling this problem is in striking contrast to the extensive war housing operations of the British government, which has spent $750,000,000 on workmen's homes. The most conservative estimate of the house shortage for U. S. government workmen is 40,000 houses. The government is now considering a definite housing program to the extent of at least $100,000,000. Let us hope it is not too late to act, for, as a far sighted leader has said, "You can't man the works unless you house the man." We may lose the war if we can't promptly house the men who man the works.

Mr. Otto M. Eidlitz, a noted civil engineer and builder of New York City, who has been given general charge of the housing work under the National Council of Defence, has testified before the Senate Committee on Commerce, January 1 to 14, 1918, as follows: "Are we trying to win the war, or are we sitting here and thinking about it? When you find a war industry is restricted to 50 or even 30 per cent of its capacity, there is a definite reason and you cannot get busy fast enough to eradicate that reason. Our problem is not a tremendous proposition; it is a flea bite compared with what England has done, because we are a larger country and have had the advantage for three years of being prepared due to the fact that we have been fabricating for our allies."

Mr. Hess, a federal expert who has lately made a detail investigation of our housing testified as follows: "The situation in

respect to housing is very apparent. We cannot get more workmen in our munition factories until we build homes for them. In one city we have 27,000 roomers, some single, some married. In one factory we have 6,500 women who are doing splendid work.

"But our trouble is not only one of *lack of labor,* it is also the increasing *inefficiency of labor,* owing to hard living condition. We certainly have got to make a man do one and one-half or two times as much work as he did before, and to do that we have got to groom him like a race horse. He has got to have his wife and family with him. You take a married man away from his family, and he is worried, because he is paying rent in the town he left and he is paying his expenses where he is; he has not the ordinary cooking that he is used to or the ordinary comforts, and that man deteriorates. If the war were going to end in May, the man might stand it, but he won't stand it for a long war. We have got to take the material that we have and stretch it out and take care of it in every way. We have got to do the unusual. We have got to do what England has done."

We must understand that the war has not made the wretched housing conditions in our cities—it has merely called public attention to it through its pressing importance. From the beginning of our present industrial system, manufacturers have seen the necessity of providing the necessary housing for the complex and expansive machinery required in their plants; but, alas, until very recent times, the laborer, the most expensive and most delicate part of the whole process of production, was expected to come to the plant like the tortoise with his house on his back. Great sums of money have been spent in scrapping machinery in order to provide the very latest and most efficient machine for the work in hand, while the thousands of human machines, upon whose physical and moral fitness must finally depend the factory's out-put, are compelled to live in hovels, often without city water, sewer, or drainage. The unskilled laborer's family must needs share with several others a single cistern for water supply and use a single yard privy in common. It is here that the undrained yards, sodden and ill-smelling, with the dishwater standing in slimy pools, invites typhoid and other diseases. The filthy yard closet, with its vault, fills the

air of the neighborhood with stifling odors and spreads contagion by means of the swarms of flies. "We have no more right to kill a man with a house than we have with a gun."

Why paint the picture further? It is the result that interests you. Jacobs Reis has summed the matter up thus. "You can't let people live like pigs and expect them to be good citizens." I may add, nor expect them to be good reliable efficient workmen or public officials. We are considering a condition which strikes deep into the heart of efficient and democratic government. We may as well realize that when this war is won, it will enlarge the freedom of other than European peoples, it will make democracy safer, even in our own country.

Our present problem is to win the war, a war already costing us over a billion dollars a month and soon to cost as much per month as the civil war in over four years. Already the war has cost an amount equal to the value of all the real-estate in New York City. Possibly before its conclusion it will cost this country 65 billion dollars, the value of all the real-estate in the United States. This is not alone a war between soldiers. In a most important and fundamental sense it is a war of laborers and citizens,—the producers of munitions, ships, and food. Greater numbers of workmen and greater efficiency of labor will shorten the war and save thousands of lives. If the war could be shortened but two weeks, the saving would justify the government in investing $500,000,000 in more and improved housing.

Time is now more important than saving money. The great German drive is now being made. Our troops need reinforcement of men, munition, and food. We need ships but we must have homes first. Will we be too late?

THE NEW ART—CAMOUFLAGE

WALTER E. BLOWNEY, e '19

Protective coloration, properly termed "Camouflage," as a necessity among armies has never until the present war become a definite and important tactic of defense. On land the modern development of the aeroplane has rendered the spectacular soldiery of former wars impossible, and in its stead have arisen the modern armies that, in order to exist, must strike and then hide. On the ocean the far-reaching submarine has made the former display of power by the battleships fatal, and as a cure for "Submarinitis" the art of camouflage has been resorted to.

The French armies were the first to realize the value of camouflage as a war measure. During the first few weeks of the war their armies were fighting behind sandbag breastworks. One ingenious Frenchman, when he saw the havoc that the German snipers were playing with the men immediately behind the portholes, conceived the idea of placing black sand bags at regular intervals to draw the German fire. The scheme worked marvelously, and before long the whole line was spotted with black bags.

From that start the development has been rapid. At the first the enemy aviators carried back to their lines in minute detail all of the movements and positions of the Allied forces. To deceive the "eyes" of the enemy two general schemes were used by the many corps of camoufleurs that were organized by both the French and the English. Important military equipment was made invisible to guard it against the destructive fire of the Huns; and, in order that the Germans might have something at which to shoot their specified number of shells, numerous imitations were placed in rather conspicuous places. From the first the camouflage companies have worked on the principle that evils can be remedied in one of two ways—they can be cured, or their effects can be minimized. The actual methods that have been used are interesting, to say the least.

A common and simple method of camouflaging trains is to cover their roofs with hay. The brown roofs blend well with the surrounding country, and as a protection against aeroplanes this device is very effective.

Enemy aviators are always interested in the positions of the large guns. A typical method of hiding the guns from their curious gaze is to cover the guns with splotches of paint to simulate shadows.

The extreme danger connected with the duties of the men in the listening posts has led to a high development of the methods of hiding these men from the vigilant snipers. Rather a common practice is to substitute paper-mache horses for the dead horses in front of the trenches. Observers remain in these frameworks and from their positions of vantage watch the enemy at his work. This substitution of imitations for the actual has become of such frequent occurrence that it is nothing unusual for a sniper to take several shots at every fallen horse in his neighborhood during his watch just to be certain that they remain "dead."

Frequently camouflage is practiced on a large scale. A story is told of one of the achievements of the French: A German position commanded a railroad track far into the French lines. An elaborate life-sized scene was painted on canvas and placed at a bend facing the enemy. Viewed from a distance it appeared as though the railroad ran straight ahead; whereas, in reality, it curved sharply back of the screen. The trick was never discovered.

Thus far in the discussion nothing has been said about the color schemes that are used to cause the objects to fade from sight at short distances. Upon the proportions and distribution of the colors depends the whole success of the disguise. Obviously, if certain colors are used to harmonize the object with its surroundings, the paints may become a boomerang if the observer has a telescope with the right light ray screens. For this reason no public description of the exact colors, curves, areas, and proportions entering into the disguises has been deemed advisable.

Four systems are in general use at the present time. In the first, in which only black and white are used, the shadows are painted white, and the high-lights black. If thoroughly carried out, the scheme is very effective. A second system is to cover the object with splotches of vivid color. When the confusing effect of scrolls and curves is added to the glare of the bright

colors, the outline of the object is made exceedingly hard to see. The French have improved this scheme by blurring the outlines of the splotches until no sharp lines are left.

One of the camoufluers, Mackay by name, has proposed and put into effect a highly original system of his own. He uses three colors in such proportions as to make the object painted look gray at every distance. The areas covered by the colors, violet, green, and red are so proportioned that, as each area comes into its proper distance from the eye, it will become gray and will be hard to see, while the larger spots glare as pure color. As the small spots mix first, the larger next, and the largest last, and as each is of a different shade of gray, the object can be said never to show its true shape or to appear its true distance from the observer.

All of the four methods of "humbugging the Hun" are in use on the ocean as well as on land; in fact, the Mackay system was designed primarily to be applied to battleships. The ever-present submarine has made the camouflage of fundamental importance within the submarine zone. The American smoke screen was about the only camouflage practiced at sea before the present war broke out. Since that time smoke boxes have been generally used by all of the navies and merchant marines. Last year a rule was made by the Board of War Risk Insurance that "After October 1, 1917, all ships sailing to European ports or ports on the Mediterranean coast of Africa must be equipped with at least one dozen smoke boxes of approved design." While smoke screens often help a ship escape the submarine, they have the disadvantage that they often attract enemy attentions.

Some of the disguises given the destroyers are often very detailed, and even at a short distance the outlines of the ship are practically destroyed. The increased safety of a camouflaged ship is not the only advantage that is gained. If by having its hull painted, the range of visibility of a ship is decreased to one half its former value, then the danger due to attack by a submarine is reduced to one fourth its former value. Conversely, four times as many submarines are necessary in order to patrol the waters as effectively as before.

Undoubtedly the development of this science is just in its infancy. What the next few years will bring out is largely a matter for conjecture.

EXPERIENCES IN THE QUARTERMASTER'S DEPARTMENT

SERGEANT CARL R. OESTREICH, c '17

Before I commence telling about my experiences in the quartermaster's department, I believe it is best to explain how it came about that I enlisted in this branch of the service. After leaving school last June I was employed by the McClintic-Marshall Co. at their Pottstown plant. This plant, which is about thirty miles from Philadelphia, was fabricating steel for government contracts only. However, I was anxious to get into the third officer's training camp. This camp was to be for enlisted men only, and with this requirement in mind, my partner, a Cornell '17 man, and myself enlisted at Philadelphia on the 17th of August. At that time the quartermaster department was the only one taking recruits. But our well laid plans for getting into a training camp never materialized, for Congress finally decided that seventeen men out of every thousand were to be taken from the ranks, and, to make matters still worse, our particular detachment was not even given application blanks. It was quite a shock at first, but fortunately the work I am doing is interesting, and even though it is not exactly in my line, I shall never regret the experience.

I was called into active service on the first of October, and was ordered to report at Old Point Comfort for equipment, and then to proceed to Newport News for duty. At Newport News I was assigned to the subsistence branch as deliveryman, although I enlisted as store-keeper. My work consisted in taking care of all the beef and ice deliveries to Camp Hill, which is in this city. Later I also took care of the deliveries to Camps Stuart and Morrison. The last two camps were thriving corn fields when I came, and Camp Hill was nothing more than a colony of tents. Besides the delivery of beef and ice to the camps, there were also the transports to be supplied. Possibly, because the transport work was new to me, I enjoyed it better than my other duties.

On December first, I was transferred as clerk to the issue department. Here the work consisted of writing up an issue of

food from a *ration return. A ration return is a statement which tells how many rations there are in an organization in some specified period of time. We divided a month into three ration periods. From this return, and by means of a conversion table, the allowable amounts of meat, bread, vegetables, milk, and spices were determined. This system of feeding troops is called "straight issue" or "issue in kind." No one is particularly anxious to take care of the issue work for it requires a great deal of tedious computation. My slide rule was my best assistant in this work, and if ever I find an Iron Cross I'm going to tack it on to the rule for saving many a weary hour of figuring.

Owing to the fact that the choice of food stuffs is limited in the issue, it is little wonder that the soldiers began to grumble when they were fed the same thing day after day. In order to avoid any dissatisfaction, the organizations were put on the "ration saving's system." In this system a certain predetermined money value is alloted per ration, and then the total money allowance for a period is merely the total number of rations for that period multiplied by the value per ration. The meals are accordingly better, because no restrictions are placed on the organizations as to just what they shall buy, providing they stay within their allowance. If, at the end of a period, the money is not all used up, the balance is deposited to the credit of the mess fund. If, however, the allowance is overdrawn, then the deficit is taken from the money for the next period. This change in systems simplified my work immensely, and now I take care of the charge accounts for beef, see that the camps have sufficient ice, and write up what is known as the "Overseas Travel Rations."

Overseas Travel Rations which are taken along from this side feed the boys from the time that they arrive in France till they get to their camps. As one can readily imagine, it takes a few days to get properly oriented and during that time the boys must be fed. The allowable portions per man are figured similarly to a straight issue.

This constitutes my work, but I believe it worth while to mention something about the transports. Things were in a rather

*Ration—Food per man per day.

chaotic state when I arrived at Newport News. No one knew just what they were doing, and ships were lined four and five deep along the Newport News Shipyard docks, waiting to have their guns mounted, crews assigned to them, and to be generally refitted so as to be serviceable for their new work. Some of the interned German boats were badly damaged by their crews, but, thanks to a new welding process, the broken parts were repaired, the ships rechristened, and they are now part of the fleet that is spelling doom to Germany. The Dutch ships that were held here are all flying the American flag now. In fact, everything is moving along so smoothly, and the ships come and go with such regularity, that it is hard to believe that there are actual dangers in store for the boats when they get out on the ocean. Our convoy method of guarding transports is very effective. Just where a convoy is formed is, of course, a matter of secrecy, but the way in which a convoy is formed is something like this. The transports are placed in the center and are surrounded by battle cruisers. Darting in and out between the cruisers are fast destroyers. This formation is held till the convoy gets across. In some of the larger convoys there are as many as thirty or forty ships. Submarines are not very often sighted, but when they are, they are usually sunk. I guess Von Tirpitz doesn't think so much of our convoy system.

It may seem strange if I tell you that we have no drill, guard duty, or manual of arms; but that is the case. The only formations we stand are reveille and muster. From five at night until six the next morning, we are free to do as we want. All of us have some definite work to do at the office, and so long as we do it no questions are asked. Our officers are some of the best men that I have met. The only trouble I can find is that there is no excitement, and quite a few of us are trying to get transferred into outfits that will see more active service. The difficulty is to get a transfer.

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GOD SPEED YOU, COMRADES

Within a few days will come the partings that mark the end of the college year. For some of us they mark the end of college life. Nearly all of the seniors have entered, or will enter, some branch of the service, or war work, prepared to give all they have, even to life itself, for the cause to which we are dedicated. For the sake of an ideal they offer themselves to the shock of battle. War has aroused us from our selfishness and

greed; it has given us a new conception of our individual obligations to humanity. Will these things be lost when war is over? Let us hope that they will not be. To the engineer, the period of reconstruction after the war will offer just as great an opportunity for unselfish devotion to duty as the present. The lesson being taught by these men who are leaving should not be forgotten. Goodbye. There is envy mixed with the regret with which we see you go. God speed you in your work; may your efforts help mightily in the accomplishment of the great object which the United States and her allies have now before them.

G. B. W.

JOIN THE ALUMNI ASSOCIATION

SENIORS: You are about to leave the College and the campus, perhaps for a good many years. It is a good deal like the breaking of home ties. You have spent a large portion of your life here, and here is where you have formed the great friendships. Wisconsin, at this moment, has a strong hold upon your affections. There are many reasons why you should not let the bonds that now unite you and your alma mater wither. There is a material reason in the fact that your future reputation is, to a greater or lesser extent, tied up with the reputation of your school; as the reputation of the school increases so will the standing of her sons in the community increase. And beyond this material reason is a greater spiritual one that will appeal to every thinking man and woman. This spiritual motive is the thing that makes men love, work for, and sacrifice for an ideal; it is the thing that lifts life above the level of a mere sordid struggle for existence—a struggle for fodder for the stomach and a cover against the elements—and makes it worth the living. The spirit of your alma mater is the reflex of many things, and not least among them is the attitude of her children toward her. Like the kindly mother she strives to be, she will glow and expand in the warmth of her children's love and devotion. And the sons and daughters of Wisconsin will be better men and women because of their affection and unselfish service. But kind words butter no parsnips and the only use that has so far been found for good intentions has been as paving

material in a place where the heat is said to be too severe for brick and concrete. There is a practical way in which you can embody these good intentions; join the Alumni Association. Two dollars a year gives you a membership and entitles you to a copy of the Alumni Magazine which is published each month. Membership in the association keeps you in touch with your class-mates and with the general university affairs, and, in times of emergency, gives you an opportunity to add your efforts to those of thousands of others in making effective your ideas and ideals. Go down to Alumni Headquarters and JOIN NOW.

KEEP IN TOUCH

Turn to the Cover of this magazine and cast your eye over the two Wisconsin men thereon depicted—brother Oestreich on the left and brother Blodgett on the right—and then ask yourself whether such smiles are not worth more than the measly dollar one pays for a subscription to the ENGINEER. It is going to mean a whole lot to you, when you are in the service and tired of strange sights and strange faces, to be able to turn the pages of the Engineer, at least once each month, and read about what is going on here at school and what is happening to the men you knew through the years of college life. It means a whole lot to any whole-souled alumnus to keep in touch with his college and with his college friends. The moral is: Walk right up and SUBSCRIBE NOW FOR NEXT YEAR. After that, if you will remember to keep us posted in regard to your movements, we will do all that lies in our power—submarines and freight blockades permitting—to see that you get the Engineer regularly.

SUMMER WORK

For a majority of the juniors and underclassmen the approaching summer vacation will be the last one that we spend in civilian clothes. Unparalleled opportunities are now open for inexperienced engineers, and the use that we make of the three months depends entirely upon our own initiative. Without a doubt every man in the Engineering College will be at some sort of work this summer. Let us see to it that next fall when

the University opens again, we can all truthfully say, "I have worked harder and have learned more during the past summer than I ever have before." W. E. B.

THE McELROY CASE

Considerable feeling has been aroused among the students and faculty by the charges made by a representative of the National Security League here at a loyalty meeting. He claims to have called the university students "damned traitors" and to have told them that they had "the souls of Prussians." The resentment aroused by these claims culminated in the burning in effigy of the kaiser and this speaker, and in an official demand by the faculty and students that he retract his statements.

Both sides of this unfortunate case have been aired before the citizens of this state and nation for the past month. We are depending upon Wisconsin Engineers to do their part in rectifying the lies that this would-be patrict has been spreading broadcast.

ACQUIRING AN ENGINEER'S LIBRARY

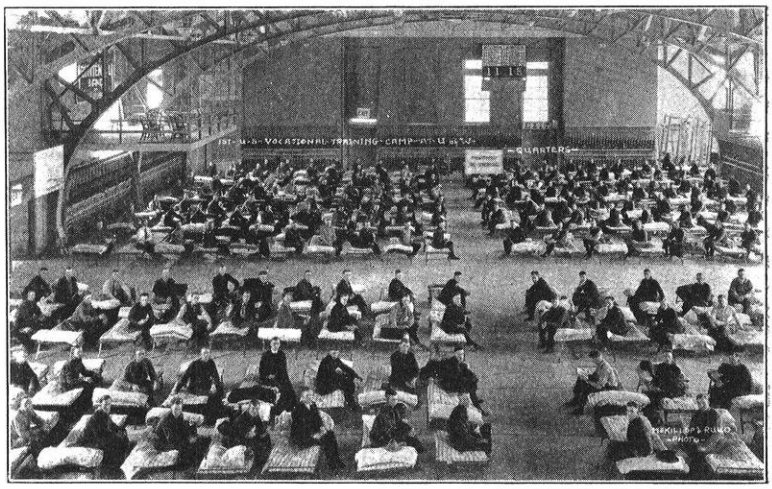
Nearly every engineering student who is really interested in the course of study which he is pursuing, wishes that he might accumulate a library which may be serviceable to him for reference in his particular branch of study. But the idea that such a collection of books would prove to be beyond his means, usually makes the student pass through his college course with his current text books comprising his only library. This impression, however, is a wrong one, for there are various ways of building up an inexpensive library for one's own self.

In the first place, innumerable manufacturing concerns publish books which, though their contents are limited in scope and highly specialized, make excellent reference books. These books have the advantage of being practical, for they are written by practical men who work in the midst of practical industries. But the student should not proceed to write for every bulletin and catalog he sees advertised; for it is safe to say that at least ninety percent of all such literature would be worthless for a library. The desirable books are usually bound in good

form, and make attractive additions to any library. A great many of these may be obtained for little or no cost.

Again, many students commit the indiscretion of disposing of their text books when these are no longer needed for use in classes. If these were kept, they would perhaps form a most valuable part of a reference library. Even high school texts are sometimes invaluable, and the important ones should unquestionably be kept, for they generally form the nucleus of a student's collection of books.

Other books should be obtained as the student sees fit. It is true that most good books are expensive. Yet a good book is always a good investment, and usually pays for itself in the course of time. It is best, however, for the student to refrain from spending a considerable amount of money for books that are to highly specialized, but rather should he purchase those which will be of immediate help to him, for if he is of the average student age, he is usually unable to tell what his future work in the engineering world will be. At any rate, the foregoing suggestions have been practiced with success; if tried by any student, they will help him to create, perhaps, one of his pet desires,—an engineer's library. R. B. B.



Courtesy of Mc Killop and Ruud
The Gym Transformed.

WITH THE COLORS.

It is desired to leave a record, as complete and accurate as possible, of the response made to our Nation's call in this hour of need, by the students, the faculty, and the alumni of the College of Engineering. We most earnestly hope that you will give your assistance and coöperation toward this end. Bits of news, extracts of letters, photographs, and material of a similar nature will be welcome and should be given to some member of the Staff, or dropped into the mailbox of THE WISCONSIN ENGINEER, addressed to WITH THE COLORS. Letters and photographs will be returned undamaged.

By LOYAL S. BAKER

HONOR ROLL (SUPPLEMENTARY)

AFFLECK, GREGOR S., senior chemical, has signed up for the Naval Reserve and is awaiting call.

AMES, KIRK D., freshman, has enlisted in the Naval Reserve. At present he is at the Great Lakes Station.

BAUTZ, GARLAND J., freshman 1916–17, has enlisted in the radio dept. of the Naval Reserve. He is at the Great Lakes.

BEEBE, GORDON A., c '13, is with Co. F., 107th Engrs., France.

BIRD, BYRON, C. E. '15, is in the Construction Section of the Signal Corps, stationed at Lonoke, Ark.

BODENSTEIN, A. F., a sophomore of last year, is now serving in France with an Engineering unit.

BOND, AUBREY A., c '17, 1st Lieut., Co. C, 5th. Engrs., Corpus Christie, Texas.

BRAUN, ALVIN C., junior chemical, enlisted in the Sanitary Corps. He will be stationed at New York.

BRUCE, WARREN R., m '17, is at an Aviation School in France.

BUCKINGHAM, LYMAN E., soph. chemical, has enlisted in the Naval Reserve.

BUETTELL, ~~ROBERT~~ B., c '13, is a captain in the Field Artillery, stationed at Camp Grant.

CAMLIN, WILLIAM J., senior civil and Manager of the WISCONSIN ENGINEER, left school on May 1 to enter the training camp for engineer officers at Camp Lee, Petersburg, Va.

CANAR, A. G., ch '16, has been summoned on the draft and is now at Youngstown, Ohio.

CAREY, A. B., c '07, is a major in the Canadian Expeditionary Forces.

CARSON, WILLIAM H., freshman 1916–17, is a sergeant in the 107th Mobile Repair Shop, 32nd Division, U. S. N. G.

CHARLSON, MELVIN R., C. E. 2, is an assistant paymaster in the Navy, with the rank of ensign.

SHERMAN, CHASE, freshman, has enlisted in the Naval Reserve.

COLE, EVERETT L., junior electrical 1916–17, is at Annapolis training for deck officer.

CONNOR, EDWARD H., freshman 1916–17, is 2nd Lieut., 37th Inf., U. S. A. Connor had the distinction of being the youngest officer in the regular army, having received his commission on his twenty-first birthday.

CORNISH, MYRON, c '15, Serg., 209th Aviation Section, Indianapolis.

COWAN, L. V., m '14, 1st Lieut., Engrs. Corps, France.

DAHLMAN, ARTHUR F., senior civil, has enlisted in the Naval Reserve and is awaiting call.

DEYLITZ, PAUL L., soph. electrical 1914–15, graduates from West Point this year with the rank of Captain.

DEWEY, ROBERT S., m '14, is a lieutenant in Field Artillery, in training in France.

DISQUE, ROBERT C., e '08, Ass't. Prof. of Electrical Engineering, who is a 1st Lieut. in the Aviation Service has been ordered from his former post at Rantoul, Illinois, to Washington, D. C.

DODGE, CHESTER C., e '17, Radio School, College Park, Md.

DONALDSON, CHASE, junior electrical 1916–17, is a 2nd Lieut. in the Engineers Corps, stationed at Camp Lee, Va.

DOOLITTLE, L. H., c '15, is a private in Headquarters Company, 312 Engineers, at Camp Pike, Little Rock, Ark.

DUNNEWALD, PAUL W., c '13, has completed the training of the 3rd R. O. T. C. and has been recommended for a commission in the Field Artillery.

EBY, SAMUEL H., c '17, is at the School of Aeronautics, Austin, Texas.

ELDRED, GEORGE, c '16, is now in France.

ENGSBERG, R. W., e '14, Radio School, College Park, Md.

FRANK, REIMAR A., soph. mechanical 1916–17 is a 1st Sergt., Engrs. Corps.

FUCIK, ROBERT A., e '10, former football star, has been accepted for the 4th R. O. T. C.

GIBBERT, A. L., m '15, Private, Co. M, Ordnance T. C., Camp Hancock, Augusta, Ga.

GIDDINGS, WILLIAM W., freshman, has enlisted in the Quartermaster's Corps. He is stationed at Newport News, Va.

GILLESPIE, JAMES E., c '08, Lieut., 43rd Engineers, American University, Washington, D. C.

GRANT, RALPH A., m '17, is a 1st Lieut. in the Coast Artillery Corps, stationed at Ft. Stevens, Oregon.

HANSEN, WALDO G., ex-m '18, is a 1st. Lieut. in the 3rd Motor Mechanics, Signal Corps, at Camp Green, N. C.

HARDIN, R. S., e '15, Radio School, College Park, Md.

HARTUNG, RAYMOND C., e '17, is at Annapolis, training for Deck Officer.

HAWN, GAVIN C., soph. chemical, has enlisted in the Naval Reserve.

HEDRICK, CAPT. ARLY L., has arrived safely overseas.

HELMLE, WILLIAM C., ch '17, has been transferred from Camp Grant to the research division of the Signal Corps, and is now under Major Mendenhall, formerly of the Physics Dept.

HENRY, LEVI L., m '15, has returned from France where he has been studying Aviation. He is now at the Aviation School at Dayton, Ohio.

HOMANN, FREDERICK A., scholar in engineering 1916–17, is an ensign, stationed at the Boston Navy Yard.

HOPPE, ALFRED G., m '17, is 2nd Lieut. in the 148 Machine Gun Battalion. His address is A. P. O. 727, A. E. F.

HUGHES, ROBERT D, c '13, is a 1st Lieut. in the Ordnance. He is manager of a center that has been established at Cincinnati in order to relieve congestion at Washington.

HYMER, HOWARD G., soph. civil, has enlisted in the flying corps of the Naval Reserve. He will go to Great Lakes first, and from there to Boston and Pensacola before going abroad.

JOHNSON, R. H., e '13, received his commission at the 2nd R. O. T. C. at Ft. Sheridan.

KNAPP, H. C., junior chemical, has enlisted in the Marines. He will spend three months in training at Paris Island, off Port Royal, So. Carolina.

KLOTZ, C. H., m '15, Ordnance Inspector, Minneapolis, Minn.

LEAN, WILLIAM H., freshman, has enlisted in the light artillery.

MATHEWS, W. W., c '08, is a graduate pilot in the U. S. Aviation Corps. He is at present attached to the Royal Flying Corps. His official address is Sig. R. C. H. S., Goring Hotel, Grosvenor Gardens, London, S. W. 1.

McKINNEY, JOHN V., m '16, is with the 161st Brigade F. A., Camp Grant, Ill.

MEISEKOTHEN, junior chemical, 28th Co., C. A. C., Fort Standish, Boston, Mass.

MILLER, CHESTER J., junior chemical, has been summoned on draft. He is in the 160th Depot Brigade at Camp Custer.

MILLER, EDMUND, ch '17, has been promoted to sergeant. He is in the chemical service at American University, Washington.

MOORE, L. E., m '00, E. C. '06, Capt., D. G. T., A. E. F., France.

MORSELL, CURTIS B., sophomore mechanical, enlisted in the Naval Reserve on April 24.

NASH, LUCIUS B., junior electrical 1916–17, ensign, Boston Navy Yard.

NATHAN, WALTER S., senior civil and member of the editorial staff of the Engineer, reported for duty at the Municipal Pier in Chicago, on April 22. He goes into training for engineer officer in the Naval Auxiliary Reserve and expects to be used in training other engineer officers. The training period covers one month at Stevens Institute, two months at sea, and a final month at Stevens. If he passes the training successfully he will be commissioned ensign.

NICKELL, G. H., c '11, Lieut., 42 Engineers, American University, Washington, D. C.

NELSON, HOWARD G., sophomore electrical 1916–17, died last month at Stormer, France, according to word received in Madison not long ago. Nelson's death was attributed to pneumonia.

NOYES, EUGENE C., c '13, Artillery Instructor, 322 F. A. Camp Sherman, Ohio.

O'CONNOR, A. J., e '14, Radio School, College Park, Md.

OESTREICH, CARL R., c '17, has been made a sergeant in the Q. M. C. He is located at Newport News, Va.

OLSON, VICTOR A., senior chemical, has signed up for the Naval Reserve and is awaiting call.

ORT, ALBERT A., C. E. '12, has been appointed civil engineer in the Navy with rank of Ensign. He has been assigned to duty at the Philadelphia Navy Yard under the Public Works Officer. His address is 1322 Locust St.

OWEN, RAY S., c '04, Captain Engrs. Corps, is now on the general staff of General Pershing, engaged in topographic work.

PAMPERIN, ARNOLD T., e '17, is an ensign stationed at the Boston Navy Yard.

PARTLETT, RAYMOND C., M. E. '16, is in the Aviation Section of the Naval Reserve and is taking a course in gas engines at the Massachusetts Institute of Technology.

POND, STUART A., soph. electrical, who enlisted in the U. S. Regulars in January, is in Co. 17, 4th Regiment, Motor Mechanics Signal Corps, stationed at Camp Greene, Charlotte, N. C.

PUERNER, BERT H., junior mechanical, has enlisted in the Naval Reserve as a 2nd class machinist's mate. At present he is acting as an inspector in the turbine reduction department at Allis-Chalmers.

ROARK, LT. R. J., recently completed his course in training at an artillery school in France; he was rated at the head of all the students at that school. He is now acting as instructor in artillery.

ROGERS, LESTER C., c '15, has completed his training at Camp Grant and has been recommended for a 2nd. Lieutenancy. He expects to be attached to the 333rd Heavy Field Artillery.

ROVE, LOUIS C., senior mechanical, Cornell School of Aviation.

RYAN, WILLIAM D., senior civil, has been accepted for the 4th R. O. T. C.

SCHLUETER, HENRY J., junior civil, left school in April to answer his draft summons.

SCHMIDT, CLARENCE W., senior electrical, withdrew from the University on April 9 to enlist in the Navy.

SCHRADER, HERBERT E., junior mechanical 1916–17, who was drafted last September, received his promotion to a sergeantcy the first part of last month. He was stationed at Camp Grant at the time.

SCHWARTZ, ERNEST H., senior miner, is with the National Army at Camp Grant.

SCUDDER, CHARLES M., c '11, C. E. '12, Instructor in Mechanics, is now a Captain in the Engrs. Corps.

SHUFFLEBARGER, F. D., c '17, Lieut., 2nd Reg., C. A. C., stationed at the Presidio, San Francisco, Cal.

SILBERNAGEL, E. G., sophomore mechanical, enlisted in the Coast Artillery on April 17.

LT. R. J. ROARK

SKIRM, JOE, min '17, is an Instructor in Gunnery at the Princeton Ground School.

SMITH, PHILIP H., senior civil, has enlisted in the Naval Reserve and is awaiting call.

STIVERS, E. R., c '15, Serg., 408th Depot Brigade, Camp Meade.

STONE, C. H., e '15, Radio School, College Park, Md.

SWETTING, J. RODNEY, m '16, Lieut., Co. 2, E. R. O. T. C., Camp Lee, Va.

SWIFT, JOHN D., soph. mechanical, Camp Meigs, Washington, D. C.

TIFFT, THOMAS D., ex-e '15, is a 2nd Lieut. in the Field Artillery. He is one of the first Americans to see actual fighting in France. He has been in action several times.

TOOMAN, ARTHUR R., freshman, has enlisted in the Naval Reserve and is training at the Municipal Pier, Chicago.

UTEGAARD, THOMAS, c '17, has completed the training at the 3rd R. O. T. C., and has been recommended for a commission in the Field Artillery.

VAN ERMEN, LOUIS, senior chemical, enlisted in the chemical division of the Ordnance Dept.

VIGNERON, E. M., e '17, Lieut., C. A. C., stationed at Portsmouth, N. H.

WASSON, J. H. c '12, Capt., Co. C, 309th Engrs., Camp Taylor, Ky.

WENDT, C. A. e '13, Radio School, College Park, Md.

WHITCOMB, KENNETH F., junior mechanical, Naval Reserve, France.

WHITNEY, E. N., c '13, Co. D, 23rd Engrs., Camp Belvoir, Va.

WOLFF, WERNER P., m '12, has completed the training at the 3rd R. O. T. C., and has been recommended for a commission in the Field Artillery.

ZIMMERMAN, O. B., m '96, M. E. '00, Major, is assistant in the design, selection, and purchase of all mobile army equipment. He is stationed at the general engineer depot. Address, 1438 U. St., Washington, D. C.

ZWICKER, MICHAEL H., soph. chemical, who enlisted in the 30th Engineers last November, has been commissioned 2nd Lieut. in the Engineers Corps.

One of our alumni, whose modesty prevents the use of his name, writes of his flying experiences as follows:

Have flown three different machines, the first being an old Maurice Farman pusher which makes a person feel like one of the pioneers in aviation; a two-seater tractor with a rotary engine; and a small single-seater scout, rotary engine. The last machine you can throw around in the air like a tennis racquet. The first time you go "solo" on advanced flying, that is in the two-seater tractor, if you don't cut loose with a bunch of stunts the instructor gets quite sarcastic when you come down. On my first trip I went to 4000′, did a loop and as usual cut off the engine when just past the top. However, when I wanted to cut it in there was nothing doing. After working with the throttle, pressure jump, etc., for about 3000′, I figured out it was time to look for a good field and come down in it. That started a series of forced landing for me due to engine trouble and to date have had seven, being fortunate enough each time to set the machine down softly and not break a wire.

The best experience I had in the bunch was about a month ago. Was up at 8000′ just fooling around and there were very heavy clouds at 4000′. Came down below these and found

the country all strange. Flew in large circles looking for any aerodrome but could see none. Finally followed a train into what I hoped would be Lincoln, but it was not. After flying a while longer saw the North Sea staring me in the face and figured that would not be a good place for a forced landing. Turned back and petrol gave out. Had sufficient height to pick a good field and just slid in over the hedge. This field was right in front of a large country place and I stayed there for two days.

The engagement of Lieutenant William Dow Harvey, m '16, to Miss Lucy Smith, has recently been announced. Harvey is with the 330th. Field Artillery at Camp Custer.

Captain John H. Walton, Associate Professor of Chemistry, has been assigned to the Engrs. Corps in charge of instruction in the use of gas masks. His duties take him to all the cantonments. A recent trip to Camp Grant allowed him a short visited in Madison. Captain Walton was married on April 18, to Dorothy Dana, '15, of Muskegon.

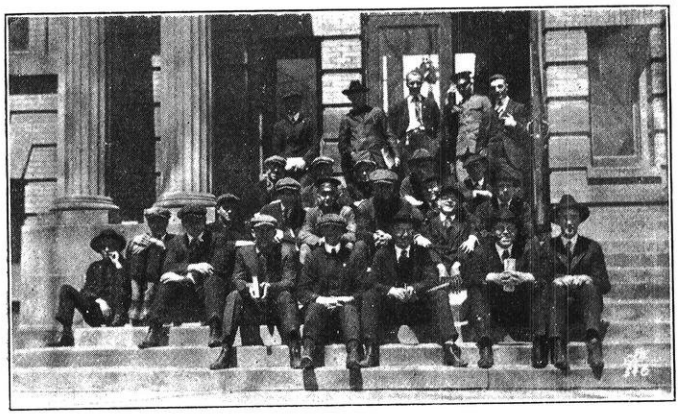


Photo by G. B. Kuebler '20

Spring? I'd Say So.

CAMPUS NOTES

Mr. A. H. Krom, Secretary of the American Association of Engineers in his lecture to the students of the Engineering College on April 23, emphasized the fact that the present war, in its various phases in the United States and abroad, is an engineers' war. The lack of co-operation between the government and the men who are trained to render engineering service is the result of the lack of organization which exists throughout the engineering profession and which makes it virtually impossible to bring "the job and the man" together.

The peculiar field of the American Association of Engineers, an organization which was formed only three years ago, is the operation of an "engineering service clearing house" which will bring the engineer into closer touch with those whom he serves, in peace or in war. The various technical societies and the engineering colleges are looking after the purely technical side of the engineer. The American Association according to Mr. Krom, finds its work in attending to the non-technical interests of the technical man.

ETA KAPPA NEWS: Friday evening, April 26, Eta Kappa Nu gave its annual dance at Lathrop Parlors. All of the Junior and Senior Electricals were invited, and everyone that came received his fill of dancing and punch.

Throughout the semester various prominent alumni of Eta Kappa Nu have been delivering lectures at the regular weekly

meetings of the chapter. On March 28, April 4, and April 19, B. E. Miller, a member of the Wisconsin Railroad Commission, gave a series of talks on "The Organization and Powers of the Wisconsin Rate Commission." On May 2, C. E. Broders, Chief Engineer for the C. F. Burgess Laboratories, told of the "Recent Developments in Electrochemistry." To this lecture the Junior and Senior Electricals were invited.

On March 21, the following men were initiated into Eta Kappa Nu: J. E. Newton, '18; H. W. Buzzell, '18; L. J. Peters, '19; K. L. Scott, '19; R. J. Svitavsky, '19; E. M. Wise, '19.

A. C. Nielsen, senior electrical, has been recommended by the faculty of the College of Engineering for a fellowship in electrical engineering. Nielsen has an unusually high scholastic record—his weighted average is 95—and in addition has been active in other lines. He is Colonel of the University Corps of Cadets and Chairman of the Executive Committee of the Student Senate. He is a member of Eta Kappa Nu, Tau Beta Pi, and Sigma Phi.

A. C. NIELSEN

On Friday, April fifth, twenty-five hundred students and faculty members gathered in the armory to pay tribute to the University's honor roll of over thirteen-hundred names. The following message was cabled to General Pershing:

"To General Pershing: Our hearts and hopes go confidently with you in battle.

The Students of the University of Wisconsin, in convocation assembled."

William Balderston, junior civil, has withdrawn from school and will take up work as ship fitter's assistant, in the Navy yards at Bremerton, Washington. His engagement to Susan B. Ramsay, a junior in the College of Letters and Science, has just been announced.

On Friday, the twenty-sixth of April, eight days before the end of the third Liberty loan campaign, it was announced that

the University had gone over the top and exceeded its quota of $150,000 by over five-thousand dollars, and it was then proposed to work right on to the $200,000 mark.

Friends of the University will be glad to know that Wisconsin has joined the American University Union in Paris. Last reports were that thirty-three Badgers now in France had registered at the Union.

Albert S. Romig, Instructor in Steam and Gas Engineering, has been forced to resign suddenly on account of ill-health. Mr. Romig, who has been connected with the faculty since January, 1916, has made many friends who regret the necessity that takes him from the College, and who hope that he may speedily regain his health.

Showing the old pep which has come to be expected of them, the Engineers added thirty points to their Nelson trophy score by winning the intra-mural basket ball tournament, finishing with a perfect score. The real contest of the year was with the Commerce quintet, and resulted in a 30 to 16 victory for the engineers. The final standing of the teams was as follows:

Team	Won.	Lost.	Pct.
Engineers	3	0	1.000
Commerce	3	1	.750
Medics	2	2	.500
Agrics	2	2	.500
L. & S	1	1	.500
Laws	0	3	.000

It is interesting to note that our old rivals, the Laws, occupy the bottom position.

Victor Lenher, professor of chemistry, has been commissioned a major in the chemical service section of the National Army. He has left for Washington.

The Hydraulic Laboratory has recently received a large sized water-driven pump manufactured by J. R. Meyers & Co., Menomonie, Wis. It uses water under low head to pump water

from the same or some other source to a higher elevation, the principle of action being the same as the small steam driven pumps; but with water, instead of steam, used to furnish the driving power. Tests, now being made on a smaller pump of the same make, show very satisfactory performance. The chief field for such pumps is for farm or small city water supplies where the fall in a creek can be made to elevate spring water. The chief advantage over the hydraulic ram comes from the fact that the pump starts and stops automatically.

The junior civils, under the guidance of professors Withey and Van Hagan, visited Chicago and neighboring cities, early

Photo by H. A. Blau '19

The 1919 Civils at Buffington.

in April, on the regular Spring inspection trip. In spite of war conditions, the party was able to visit nearly all of the usual places.

In their Spring initiation, Pi Tau Sigma took in the following mechanical engineers: E. J. Mueller, '19; E. B. Williams, '19; E. Schmidt, '19.

Three General Electric 75-KVA transformers are being installed in the Chemical Engineering Building. They are to be

used for the electric furnace work and will be available at all times to furnish power. Power is brought to the building at 2300 volts and will be stepped down by these transformers to 110 volts. This equipment will make the facilities in electric furnace work in the Chemical Engineering Department very strong, stronger indeed than those of any other school in the middle west.

Thomas B. Mullin has been recommended by the Engineering faculty for appointment as Scholar in Hydraulics for the year 1918–19. Mr. Mullin is a graduate of Queen's University, Kingston, Canada, and has had considerable experience in Municipal and Sanitary work.

You can't tell by their looks. There's Stewart Turneaure; he doesn't look like a German spy and yet he was arrested twice within six months on the suspicion that he was a henchman of Bill, the Kaiser. The first time was in Cleveland on July 4. He was with a valuation party working on the railways in that city and amused himself on the National holiday by taking photographs of some track elevation work. It took him twenty four hours to clear himself. The second time was during the Christmas vacation on a journey to Alabama. He surrounded himself with maps and sketches and showed a suspicious interest in bridges and interlocking plants. The con saw a croix de guerre for himself and tipped off the authorities, so when our hero alighted at the junction point he was nabbed by the constabulary—accent on the bull please—and hauled before the magistrate. This time it took him only a couple of hours to clear himself. Really, does he look "desprit?"

Physics

ALUMNI NOTES

By WALTER S. NATHAN

E. E. Parker, c '07, City Engineer of Madison, has recently made a trip to New Orleans and San Diego to inspect possible sites for shipyards in the interest of the Emergency Fleet Corporation.

Oscar F. Gayton, c '09, is in the engineering department of the Truscon Steel Co., at Youngstown, Ohio.

Harrison L. Garner

Harrison L. Garner, c '09, E. E. '15, was elected alderman in the Fifth Ward, Madison, at the recent election. He defeated his opponent by 592 votes to 370.

Walter Alexander, m '97, M. E. '98, has resigned his position as Superintendent of Motive Power of the C. M. & St. P. Ry. Co., and has accepted the managership of the Milwaukee Land Co., a subsidiary of the railway company. At present the Land Co. is chiefly engaged in getting out timber.

O. H. Frick, ex-c '02, visited the College in quest of engineers. He is with the valuation department of the C., M. & St. P. Ry. with headquarters at Room 21, Union Depot, Milwaukee.

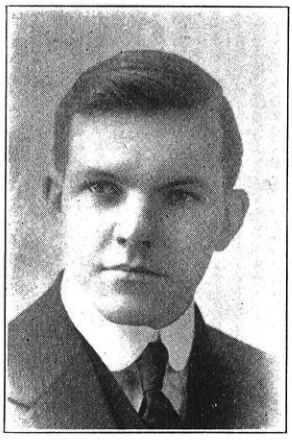
The Concrete Ship Section of the Emergency Fleet Corporation has received another Wisconsin recruit in the person of Leonard F. Boon.

Sam R. Hatch, c '07, has resigned from the staff of the Wisconsin Railroad Commission to join the Public Utilities Commission of Missouri. His headquarters will be at Jefferson City, Mo.

J. T. Kimball, e '14, has resigned from the staff of the Wisconsin Railroad Commission to take up work with the D. C. and W. B. Jackson Company of Boston.

H. K. Weld, g '05, Capt., Co. A, 2nd Battalion, Minn. Home Guards.

Paul Mitchell, e '16, died on March 14, 1918, at his home in Milwaukee, after an illness of three days. Typhoid fever was the cause of his death. Paul Donald Mitchell was born January 5, 1893, in Milwaukee and received his early schooling there. He was graduated from the civil engineering course of this College with the class of '16. He was a member of Triangle. Because of his engaging personality he made many warm friends among the faculty and among his fellow students. For a year and a half after graduation he worked with the Milwaukee Sewerage Commission; for the past year he was assistant manager for the Milwaukee Coke and Gas Company. On August 18, 1917, he married Lucy Rensimer. He was a brother of Dr. Ralph K. Mitchell, '11, who died in 1916, and of Lt. John G. Mitchell, who was a junior in the Law School at the time of his enlistment. Marie Mitchell, a junior in the College of Letters and Science is a sister.



Arthur D. Fulton, M. E. '16, has gone into reconstruction work which the Society of Friends is carrying on in France.

Paul F. Isobe, who did graduate work in Chemical Engineering here in 1911, is now on a business trip to this country. He is Chief Engineer in the oil department of Suzuki & Co. and has complete charge of the oil hardening business. The Company's headquarters are in Kobe, Japan, but its works are situated in several places in Japan and Manchuria.

Henry C. Zantow, m '09, is celebrating the arrival of a son, Forrest Earle, on Friday, April 12.

The many friends and admirers of Joseph A. Manington will be interested to learn that he is to be recommended for a degree this year as of the class of 1903. Since leaving school Joe has been engaged in railway work with the exception of a period when he was working on the Panama Canal. At present he is a Captain in the Corps of Engineers.

T. A. Carlson, ch. '17, is doing chemical work at the American University, Washington, D. C.

Adolph F. Meyer, '05, C. E. '09, associate professor of hydraulic engineering at the University of Minnesota, has been appointed Chief Engineer of the Minnesota & Ontario Power Co., and subsidiary companies, with headquarters at International Falls, Minn.

Borrowed cut

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* Indicates illustrated article.