JOURNAL

ROYAL ARCHITECTURAL INSTITUTE OF CANADA

VOL. 20 TORONTO, AUGUST, 1943 NO. 8

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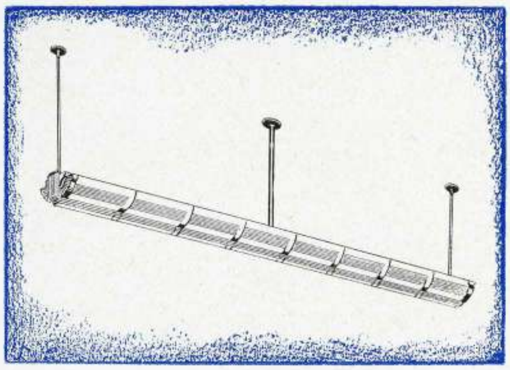

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JOURNAL

ROYAL ARCHITECTURAL INSTITUTE OF CANADA

Serial No. 216 TORONTO, AUGUST, 1943 Vol. 20, No. 8

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J. F. SULLIVAN, PUBLISHER

SUBSCRIPTION RATES

Canada and Newfoundland—Three Dollars per year. Great Britain, British Possessions, United States and Mexico—Five Dollars per year. All Other Countries—Six Dollars per year. Single Copies—Canada 50 Cents; Other Countries 75 Cents.

THIS ISSUE OF THE "JOURNAL" WAS INSPIRED BY MR. GOLDFINCH'S CHAPEL FOR BRITISH troops in Iceland and by Col. Waters' Officers' Mess at Debert (illustrated in the June, 1942, issue of the "Journal"). We had a feeling that the soldier of this war was not only better fed, better clothed and better armed than in the last war, but he was better housed. That in keeping with the splendid plans for his rehabilitation as a civilian, the Canadian soldier was living in quarters not too removed from the spartan structural simplicity of a good summer cottage; that he was dining in a hall as good as the best built by industry for its war workers, and that he was worshipping in a building in which the religious atmosphere was at least half as noticeable as the one in Iceland shown in this "Journal".

We had in advance also the pictures in colour of triptychs used in chapels for the Armed Forces of the United States. In them, colour and design are so combined that any corner of a destroyer or shack in Guadalcanal where one was set up could not but be distinguished as a holy place of great beauty and solemnity. We assumed that Canada would not be behind in such matters, especially as they involved taste and inspiration rather than money.

So it was with the highest hopes that we got in touch with the Publicity Department of the Navy, Army and Air Force in an endeavour to show readers of the "Journal" throughout the world a number of typical buildings that would give them satisfaction without giving "comfort to the enemy".

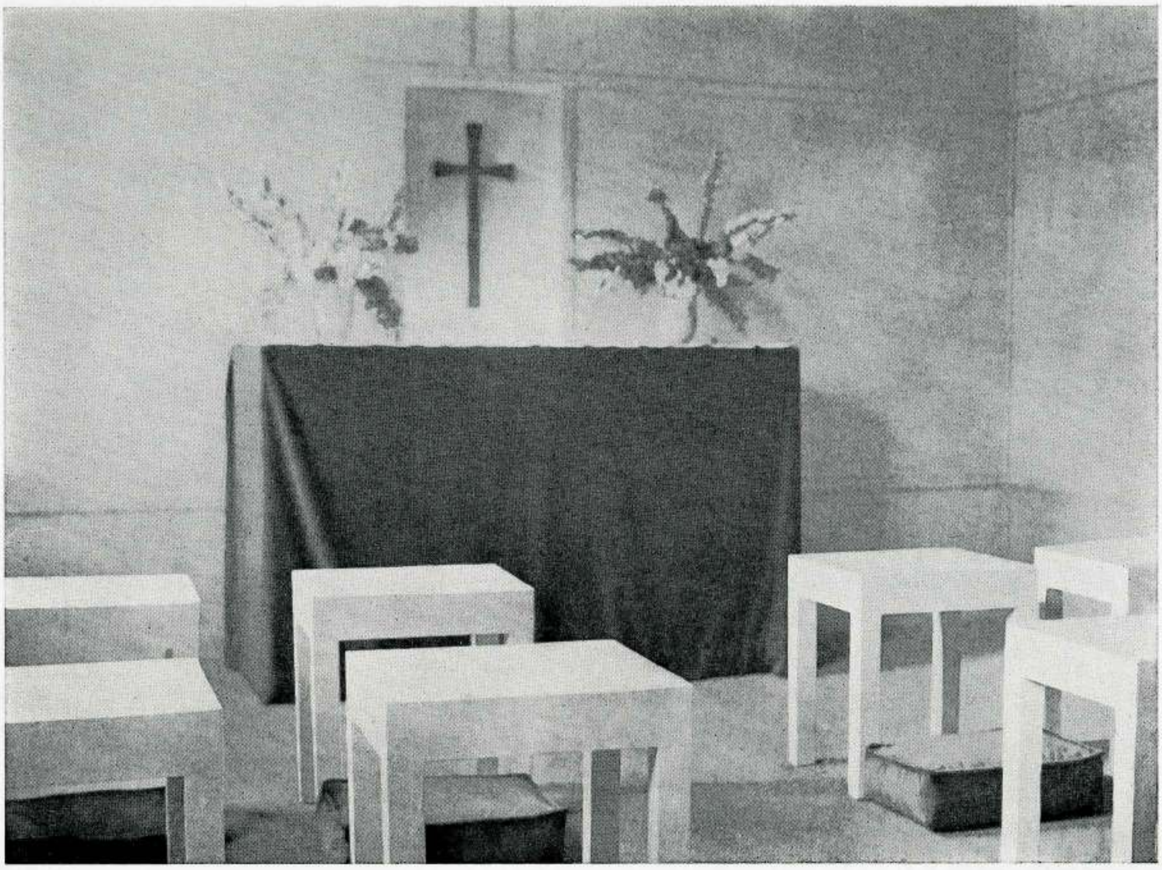
From a pile of "architectural" photographs obtained from official sources, we have discarded those showing troops bathing, General McNaughton, Mr. Winston Churchill, altered exhibition buildings, C.W.A.C.S and other important but unarchitectural subjects, and illustrate in the following pages the best buildings, so far as we know, built for troops in Canada. It will be seen that the Royal Canadian Air Force and the Royal Norwegian Air Force in Canada have between them set a standard of building as high, we imagine, as any in the world, but the buildings of the Army have all the marks of impersonal officialdom and all the dreariness that goes with the assumption that a temporary building is necessarily a slum. There could be only one justification for the Army "standard type Dining Hall and Kitchen" (see page 129). It is the kind of building that might be erected in an hour to isolate the dying victims of a plague in the period preceding Florence Nightingale. The unspeakable Firehall at Borden with its funny little sign is no doubt a show piece visible from a highway.

The Navy has not produced slums, but it has little to show that would be illustrated here or in any other architectural paper except to complete a record of the armed services' achievements in building. We have space here to refer merely to the grandiose and unrelated steps to the Administrative Building and the scale of the buildings in the group, and the hodge podge of brick and stone with stone bull's eyes in the parapet of the Gunnery and Torpedo School. The R.C.N. College at Esquimalt stands out from the rest as a carefully studied piece of work.

We can turn with relief to the R.C.A.F. and the R.N.A.F. The buildings of both seem to have been designed with great care to make them attractive to the men who would use them. One feels instinctively that they were designed for men who would appreciate them, and that the creation of an atmosphere of taste and general culture is not an unimportant part of training. The R.C.A.F. buildings have elegance, charm, dignity and suitability to their purpose and we are sure that the illustrations shown here will do much in the United States, Great Britain, Russia, South America and the Dominions to impress people with the force of Canada's war effort.

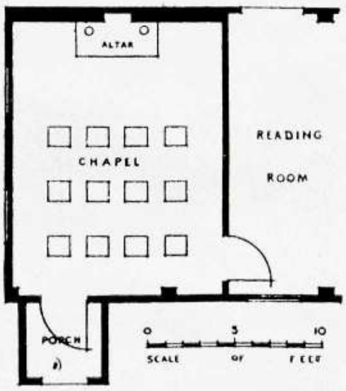
We are delighted to illustrate, perhaps for the first time, the buildings of the Royal Norwegian Air Force. Their Camp is indeed a little Norway away from home in which the Norwegians have shown all the charm and suitability of the R.C.A.F. buildings coupled with the native genius for handicraft which one associates with the Norwegian people. In addition to the excellence of individual buildings and the group, of which only a small part is shown, interiors and furniture would put most of our best summer hotels to shame.

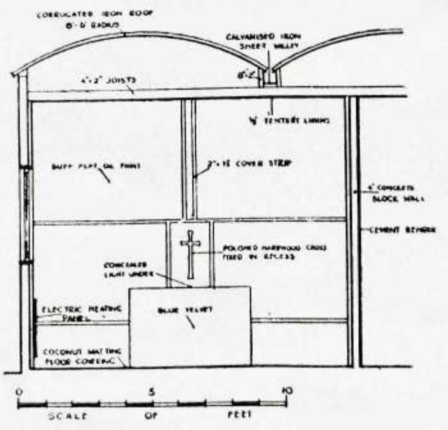
In both the R.C.A.F. and the R.N.A.F. one is conscious of the influence of architects filled with enthusiasm for the job they can do for their country and with respect for the manners, and customs of the officers and men whom they have to house. The cost in money may have been greater than the Army "standard type tar paper dining hall and kitchen" but the effect on morale and on the future civilian on demobilization is incalculable.



Y.M.C.A. CHAPEL IN ICELAND

CAPT. DONALD A. GOLDFINCH, A.R.I.B.A., ARCHITECT





THE WORKS AND BUILDINGS ORGANIZATION IN THE ROYAL CANADIAN AIR FORCE

By GROUP CAPTAIN F. H. MARANI, V.D.

Air Force on one station has made use of an old farm Silo for special wireless equipment

One of the largest problems which presented itself on the formation of the British Commonwealth Joint Air Training Plan in Canada was the design and immediate construction of upwards of 100 flying and ground schools. As there was practically no experience in this country in designing the type of schools now required, it was necessary to rely to a great extent on experience gained in England. Various types of buildings which had been built there were studied and adapted to suit Canadian materials and climate.

The responsibility for approval of all this construction work was placed on the shoulders of Air Vice-Marshal G. O. Johnson, C.B., M.C., then Deputy Chief of the Air Staff.

At the outset it was obvious that there was no time to bring in practising firms of architects and engineers and acquaint them with all the problems and pitfalls in the design of large Air Training Schools. Committees were in constant session and the planning and detailing had to be done with the closest possible contact with these committees. As well, much of the information required in the planning of stations and buildings was of a secret nature.

Until shortly after the outbreak of war in 1939, construction for the Royal Canadian Air Force was handled by the Royal Canadian Engineers. At this time, however, it was found that the Army's demands on the Engineers were so extensive that the handling of Air Force plans and supervision of construction turned out to be unsatisfactory. It was, therefore, decided to develop the Works and Building Branch of the Air Force so that the design and supervision of construction of all buildings and the maintenance of structures and aerodromes would be handled completely within the Air Force. This meant the gathering together of personnel from civilian life. The policy of whether personnel were to be civilian or service was controversial at the outset and wavered backwards and forwards. Now, the great bulk of Works and Buildings' personnel, which numbers many thousands, is composed of service men and women. There are, however, notable exceptions in the case of civilian architects, engineers, and others, who, because of age or medical category could not be enlisted, but neverthless have done very important work. So far as possible these positions are being retained as civilian.

The hurried building up of such a large organization within the Service has had both its advantages and disadvantages. I think that it is safe to say it would have been impossible to have organized within the Service, even with a head start in peacetime, the technical training and experience which it was possible to obtain by drawing from the civil professions and the construction industry. On the other hand, the trials and tribulations presented by the lack of experience in service routine and procedure were very great and often very amusing. As well, there was set up in the Service, a large and important Branch, whose work methods and general outlook were a complete mystery to the older Branches.

At the outbreak of war the Director of Works and Buildings was Group Captain Shearer, now Air Vice-Marshal, but W.C., now A.V.M., Collard, C.B.E., was made D.W.B. in April, 1940. All work in connection with B.C.A.T.P. was taken over from the Engineers July 1, 1940, and in September, 1940, the W.B. Directorate was operating entirely independently of the R.C.E.

Air Vice-Marshal Collard served with the Artillery in France during the last war and had had no service experience since that time. He had, however, a greal deal of construction experience, being vice-president of one of Canada's leading contracting firms and had the confidence of the construction industry. As things have turned out, this lack of service training has been a benefit rather than a hindrance, as he was not handicapped by the inhibitions which a long service experience might have produced. Many special concessions, both from the Treasury and from the Civil Service Commission were requested and eventually obtained. Without these, it is doubtful if the training plan could ever have attained its present success.

In spite of these concessions, however, the problem of planning and construction of hundreds of millions of dollars worth of work in an extraordinarily short period of time was a very great one and it is surprising that so much was actually accomplished with so few major errors.

One of the greatest headaches has been the employment of civilians, and the amount of paper work necessary to get the right man in the right place, and satisfy the Civil Service Commission, would cover many issues of Eaton's catalogue without providing their secondary traditional usefulness.

New construction comes under the local supervision of a civilian staff on each project, consisting of a senior architect or engineer with a supporting staff of assistant and junior engineers with accounting and clerical assistance. Maintenance begins directly the Station is occupied by the Air Force and, in the main, is handled by service personnel in the Works and Buildings sections on the Station. The whole of Canada is divided into 6 Commands. The training scheme is made up of four (4) Training Commands and as my responsibility is confined to No. 1 Training Command (Ontario), repeated reference to this Command may be excused. The Works and Buildings organization at Command Headquarters is responsible for both new construction and the maintenance of buildings and aerodromes. Aerodromes have been constructed under the direction of the Department of Transport, who at the outbreak of war already had an organization set up for this purpose. They do not become the responsibility of Works and Buildings until the aerodromes actually come into use. The initial water supply was also the responsibility of the Department of Transport, but as many aerodromes were selected without the anticipation of accommodating so many men on the site, the location of a sufficient supply of water was a minor consideration and in many cases has turned out to be a major problem. Some Stations are only now completing the installation of a satisfactory supply of water, after being in operation for two years. It is only fair to say that, after the initial skepticism evinced by the Department of Transport concerning this very large and uninitiated Works and Buildings Branch, their co-operation has been excellent. Siting of buildings and planning of standard buildings is all done at A.F.H.Q. Only sewage systems and special buildings to meet unusual conditions are designed at Command Headquarters.

Another matter of extreme importance, which should be mentioned is the support which was given to the whole project by the construction industry. The initiative and enterprise displayed by the contractors in the face of almost overwhelming obstacles, such as bad weather and ground conditions, and also from the inadequancy of hastily produced plans and specifications and because of speedily organized and unfamiliar Headquarters and field staffs, was most remarkable. The amount of work carried out in good faith with nothing more than a verbal order would amount to millions and the subsequent difficulties in seeing that the Contractors were properly paid would take volumes to recount.

A word should be said here regarding the field engineering staffs and the Officers responsible for their direction and coordination. These men did an excellent job, under very heavy pressure, usually working 12 to 15 hours in a day. In No. 1 Training Command, two Senior Officers and four of the original Supervising Engineers died practically in harness, but many of those who started out as civilians are now in the Service as Officers, Foremen of Works, etc., and are a most valuable element in the organization of Works and Buildings.

The apprehensions of many, concerning the reflection on the service which would be produced by placing a lot of uncouth and decrepit construction hands in uniform, I think by now has been dissipated. I am very glad to state that the first detachment of eighty Works and Buildings' Personnel, which was transported by the C.P.R. from Toronto to form the nucleus of the Construction Unit on the West Coast was reported by that Company as the most orderly and best behaved party that they had conducted.

Some figures on the extent of construction and maintenance in this Command may be of interest:

If all the hangars built in this Command since war broke out, were put together as single hangars from end to end, they would enclose a covered way 120 feet wide, or nearly twice the width of Yonge Street, from the water front right up to the end of the car line, at the City Limits, at Hoggs' Hollow, or $7\frac{3}{4}$ miles.

The paved areas to be maintained on Stations in this Command would provide a paved road from Montreal to west of London.

There are in this Command alone, 1,403 heating units, 6,577 electrical motors and 98 miles of water and sanitary sewer mains to be maintained without counting surface and storm drains.

There may be some who feel that the practising architectural and engineering firms should have been employed in the design of this work or engaged in a consulting professional capacity. I think, however, it is now quite obvious to any of those in a position to know that this method was impossible. Not only were there details left to be studied and worked out by various branches as the construction proceeded, but overseas combat conditions were dictating changes in the training syllaba which were continually altering the planning of the buildings even before Stations were completed. Those of us who have had trouble because of clients making changes can understand how much worse that situation can become with a very dangerous enemy threatening their existence.

The use which will be made of these buildings and aerodromes when the war is over has not yet been announced. One is reminded of an old saying in the Permanent Forces, many of whom were accommodated for years in buildings intended only for the duration of the last war. "There is nothing so permanent as a temporary building."

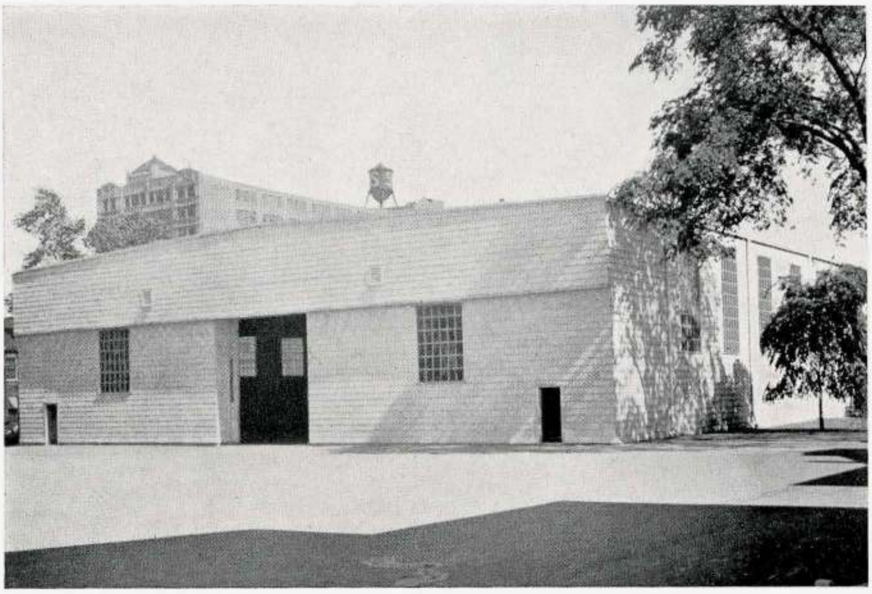
R. C. A. F.

AIRMEN'S BARRACKS SPECIALLY DESIGNED FOR AN URBAN SITE

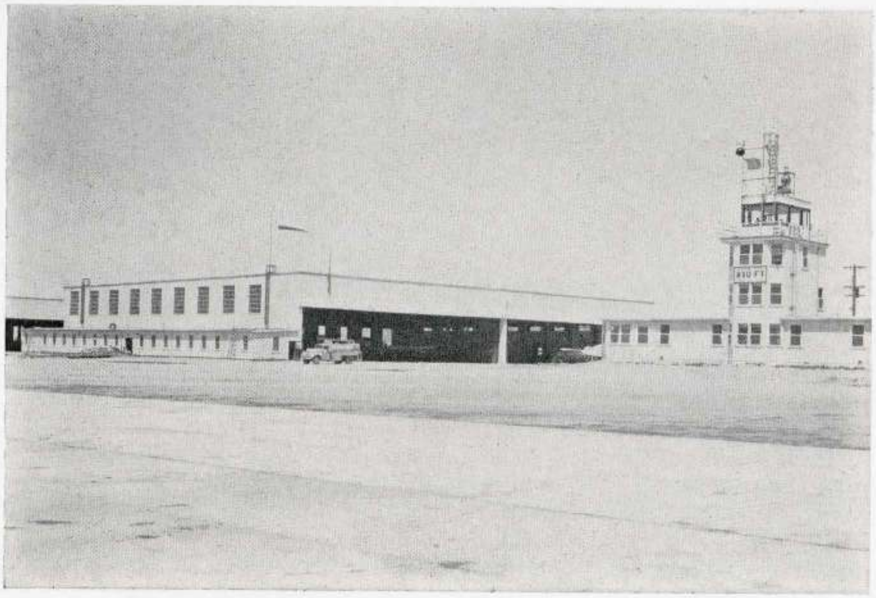
AIRMEN'S BARRACKS

WOMEN'S DIVISION BARRACKS

SMALL CHAPEL ON AN R.C.A.F. STATION



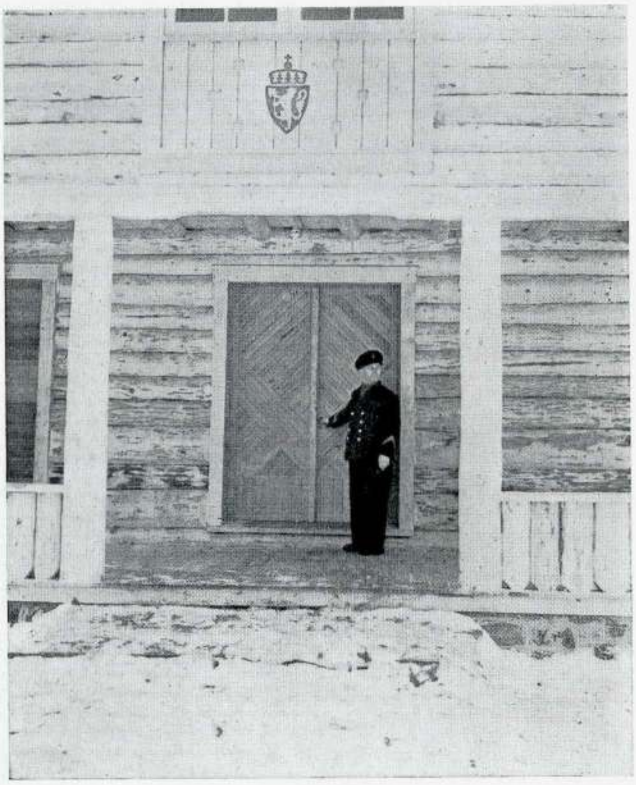
STANDARD R.C.A.F. DRILL HALL



STANDARD FLYING SCHOOL CONTROL TOWER AND LAND PLANE HANGARS

WOOD, A NORSE BUILDING MATERIAL

By SEC. LIEUT. JOHN ENGH, R.N.A.F., Architect M.N.A.L.



DETAIL OF MAIN ENTRANCE

Wood is Norway's natural building material and the Norse have, through the centuries, developed a very high wood-building culture. The forests are larger than in most European countries and logs were probably the first structural material primitive man made use of to provide himself with a shelter.

Stone and brick which were the prevailing materials used in most of the European countries, were not used on a large scale in Norway for residential buildings until recently. Even for large structures such as churches, wood has been the popular material in rural districts and very bold wood constructions were erected in the "Stav" churches in the period from 1,000 to 1,500 A.D. Fire danger restricted the use of wood in cities, but even though walls were erected in masonry, the floor and roof structures are mostly wooden and it is only in recent years with the development of concrete, that real fireproof buildings have been erected in urban areas.

Wood and wood products will probably always be the prevailing building material in Norway, not only because of her rich forests but also because the Norse consider it a warmer and more homelike material, and prefer to live in wooden houses. The great structural qualities of resin-bonded plywood and new processes for fire-resistant treating of wood seems also to promise a better future for our country's popular building material and might do away with some of the fear of using wooden houses that followed the German bombing of our West and Northern coastal towns in April, 1940. Wooden houses proved that they could withstand the air pressure from bomb bursts, but were an easy prey to fire bombs. A new and stricter fire code will probably be put into effect with the reconstruction of devastated areas. As wood lends itself easily to house prefabrication, it will be the obvious material to use in the urgent and great problem of our rehabilitation after the war. The development of new war "substitutes" of wood products might also open a new wood era causing major changes in building construction in which wood countries such as Canada and the Northern countries should play a leading role.

Wood construction in Norway may be divided into four main groups.

Log construction, "Stav" construction, "Reisverk" construction and frame construction—mentioned in historic sequence. Log and "Stav" construction are of prehistoric origin and developed a high craftsmanship culture very early in history.

"Stav" construction was used mainly for large church structures and is a very elaborate system with log columns, large wall panels of upright planks, a very fine bracing system of roofs and columns and one-inch wood shingles both on roof and walls. Some of these churches from the 13th to the 15th Centuries still exist, and it speaks well for their good craftsmanship. "Stav" construction has not developed into a modern wood construction because of all the detailed work involved.

"Reisverk" construction is somewhat related to "Stav" construction. The wall is solid and consists of a core of upright heavy planks with wood siding both inside and outside. Insulation paper is put in between the core and the siding to a degree varying with the requirements of the building code of the particular locality. The construction is very warm and solid but wastes material somewhat. Because of its relatively high fire-resistant qualities, it is the only wood construction allowed in most suburban zones, although forbidden for urban use.

Frame construction in Norway is very similar to Canadian. It is used only where there are no building codes in rural districts as it is considered too susceptible to fire because of its hollow wall.

The log house was the common residential building in our country for centuries and it is still every Norwegian's dream to own a real log cabin for his sport and recreation home.

The farmers have, in the last century, drifted farther and farther away from log buildings for their homes, not because of the unpopularity of the log house, but because of the slow building process and the fact that the forests had been cleared so much around the farms, making transportation of good building logs difficult. But the log-building art lives in most farmers and they still build their cattle farms in the mountains ("seter") in the old way. Sport cabins and some mountain hotels are also built in the popular log construction.

The log house as it is built in the Scandinavian countries differs in construction methods from the pioneer log house so familiar in Ontario. The houses were not built as a temporary and very urgent shelter such as the Canadian pioneer house, while keeping one eye on the Indians. The Norse, building his log house, was building for the generations to follow him. Every detail was built to withstand the wear and tear of years and each generation worked on the family farm to improve it. It was a great sin to allow the farm to deteriorate, and considered every man's duty to leave the home to his son in a better condition than his father had left it to him.

Some of these farms, hundreds of years old, are turned into museums and marked as reserved places. They are considered amongst our proudest treasures. The logs were worked with an axe and chisel and fitted one to the other. Moss was laid in between the logs. The corners were cut in a very complicated and elaborate way to keep moisture and draft out. There were several corner-cutting systems of different date and location. The roofs were covered with birchbark and then a layer of turf which was kept green and often covered with flowers. If the grass was allowed to die, the roof was useless.

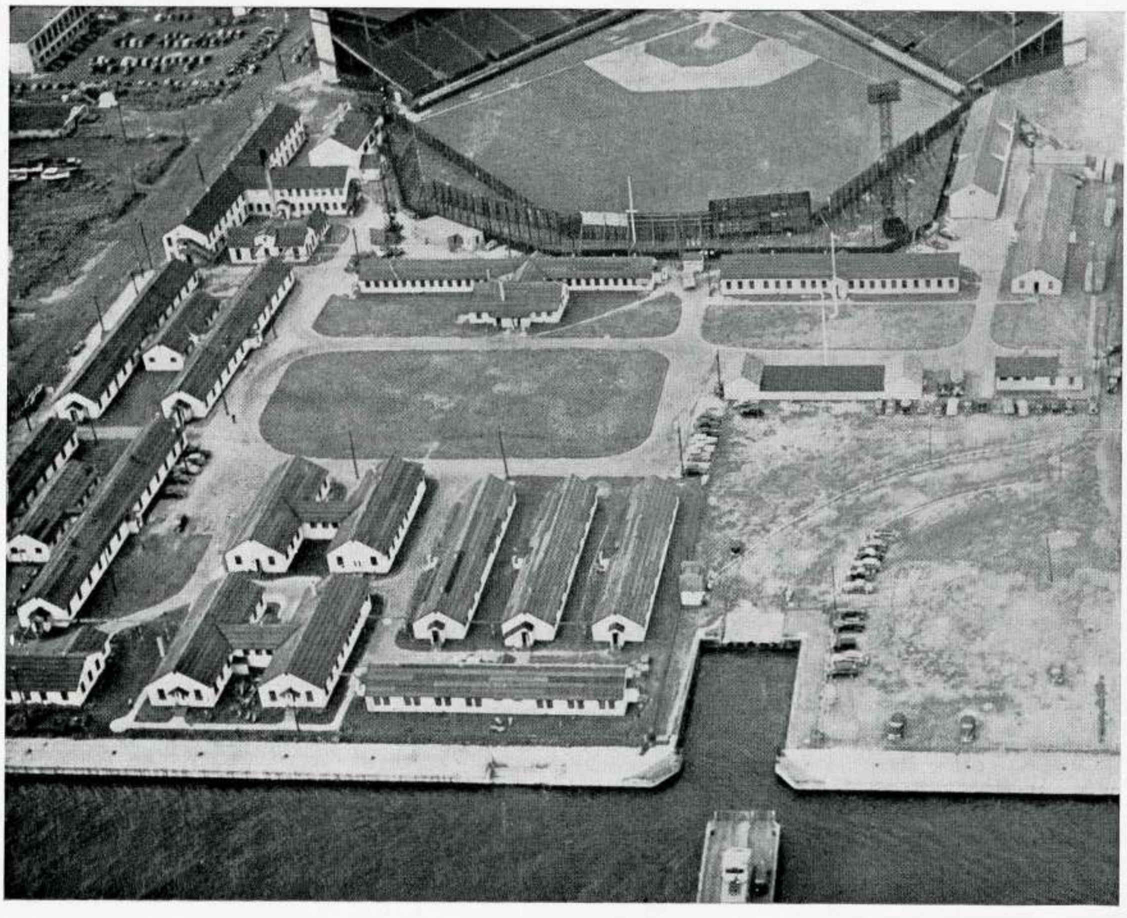
The log houses erected by the Royal Norwegian Air Force in Canada don't pretend to be typical Norwegian log houses in every detail. The urgent character of military building forbade it. However, by the use of good Scandinavian-Canadian handicraftsmen, the buildings were erected in an average time of four months and still have some of the quality of Northern log buildings. The log building lends itself readily to messes and officers' clubs, with its economic and yet warm and decorative interior finish.

The logs are fitted and caulked with tar oakum (before oakum was a restricted material), and the corners cut in a simple, yet satisfactory manner. They are permanent, and unless damaged by fire, will stand for generations. The square foot price compares favourably with conventional camp buildings—approximately $3.00. The logs were, with the exception of a few long poles that had to be purchased, hewn on our own property.

Mr. John Hill was our builder and Mr. Harry Laakso our log carpenter foreman. We owe it to their experience and interest that we were able to get together enough skilled craftsmen who finished the work quickly and in the desired manner.

"Vesle Skaugum" at Interlaken is planned for easy conversion to a camp or recreation resort, as its location near Algonquin Park, good hunting, fishing and bathing, lends itself to such a purpose.

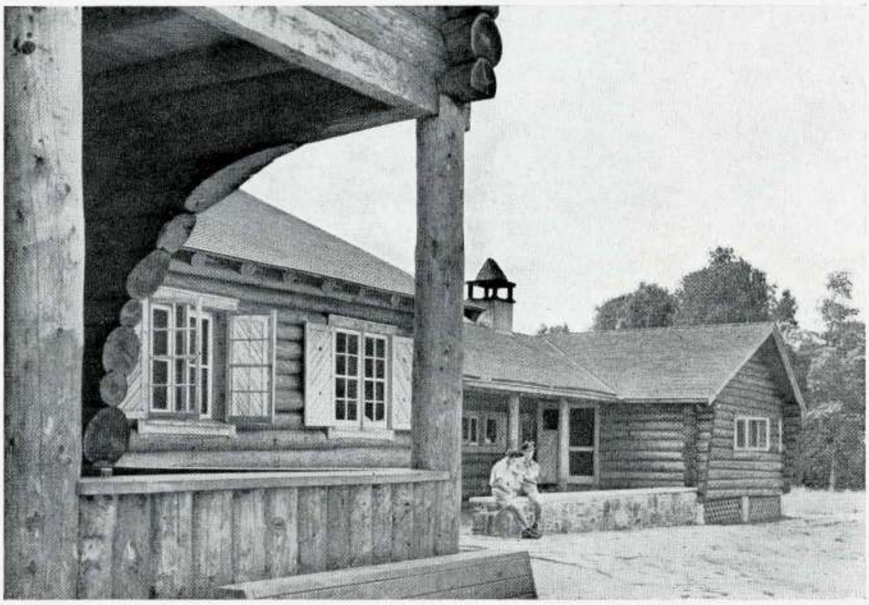
In its surroundings, so similar to Norway, we hope it will stand as a memorial to the strange episode in Norwegian and Canadian history, when thousands of miles from home, young Norwegians lived for a time and enjoyed Canadian hospitality. We also hope that this "accident" of war will promote a closer collaboration between the architects and engineers of Canada and the Scandinavian countries, as our problems and natural resources are so similar.



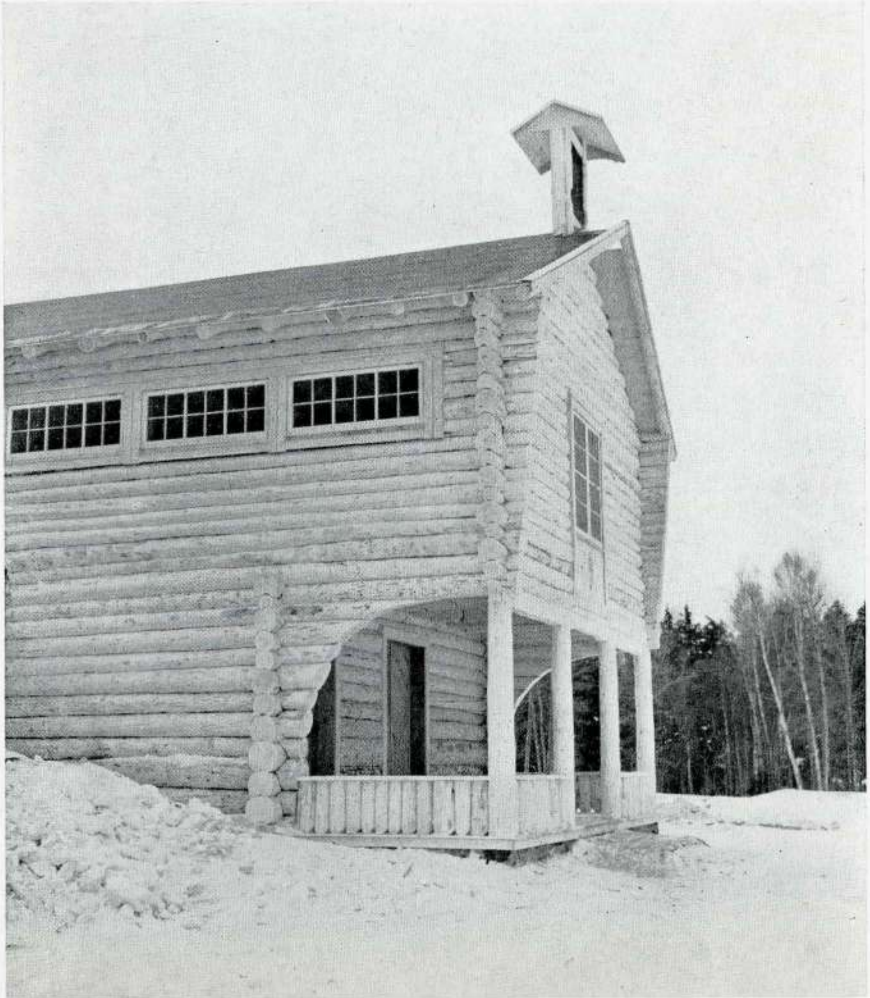
LITTLE NORWAY

R. N. A. F.

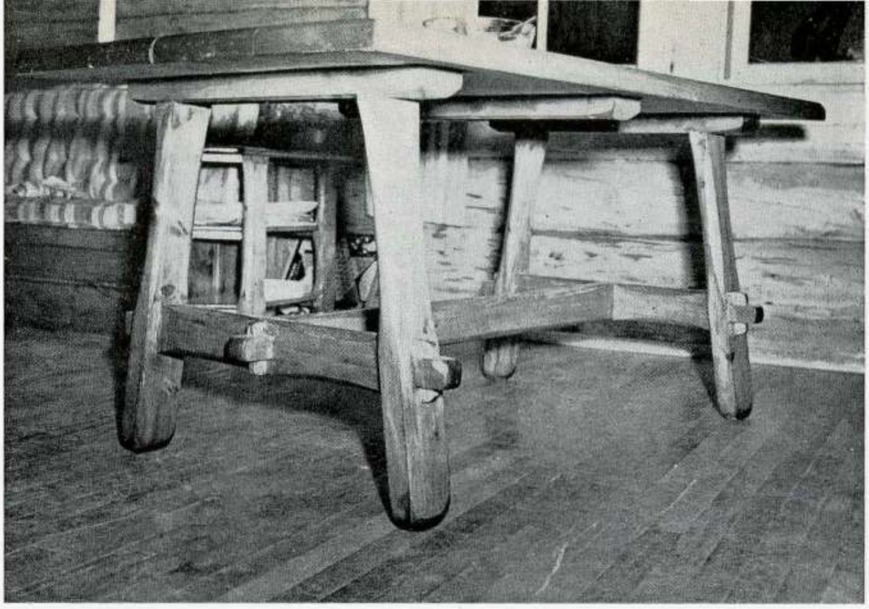
OFFICERS' AND AIRMEN'S MESSES



THE MAIN LODGE

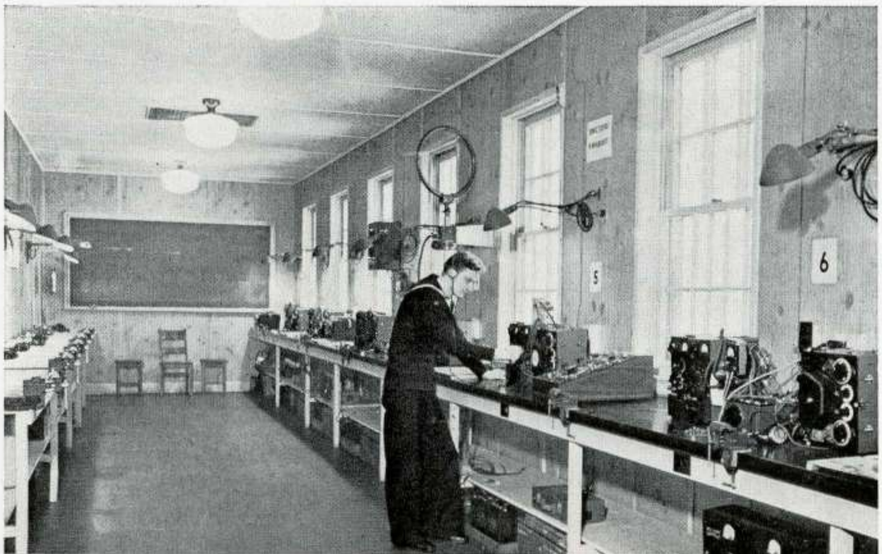


MAIN ENTRANCE



DINING TABLE

INTERIOR OFFICERS' MESS

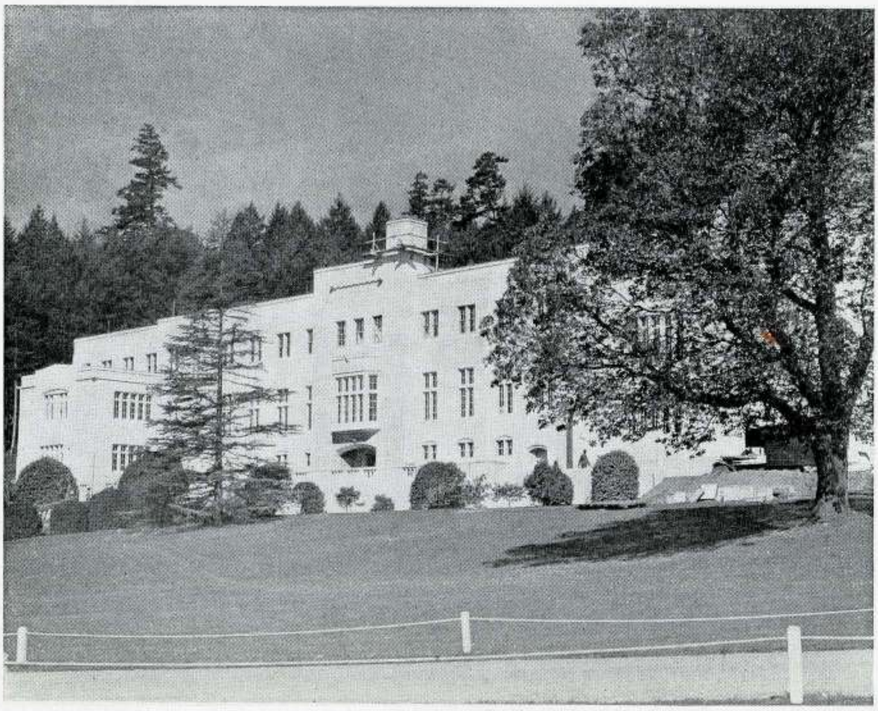


RADIO SCHOOL LABORATORY

NAVY

ADMINISTRATION BUILDING, R.C.N.

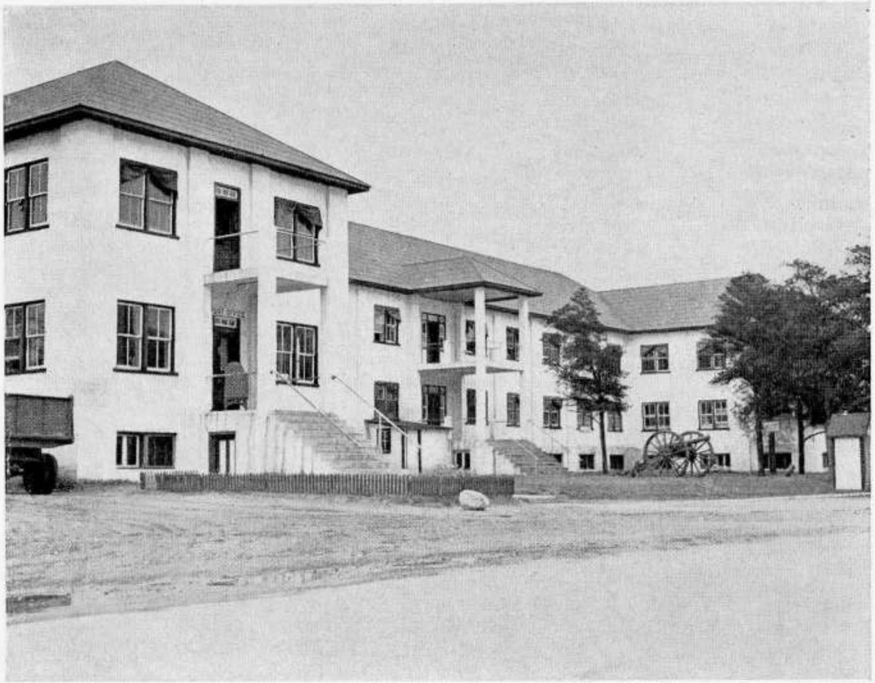
GUNNERY AND TORPEDO SCHOOL, R.C.N.
ROSS AND MACDONALD, SUPERVISING ARCHITECTS



R.C.N. COLLEGE
McCARTER AND NAIRNE, ARCHITECTS

ARMY

"A standard type dining hall and kitchen of lumber and tarpaper construction as built and used by the Canadian Army. The dining hut can accommodate 500 men at one sitting, 250 in each half of the building. The hut is considered of temporary construction."



"This is a permanent type building constructed by the Canadian Army to house administrative staffs. It is the type used as administration buildings in permanent army camps and is of stucco and cement construction."

FIRE HALL

In any number devoted to the structures of the armed forces of those who fight for the four freedoms, it would be sad not to find some notice of the true spiritual forces that have in the end always brought victory to those who held them. Faced with reality of the Great Adventure continually before them, many of the men who fight have found in the forces of spiritual religion strength, understanding and comfort. Strength of will, an understanding of the world's turmoil and comfort in adversity are essentials of military training. The Citizens Committee for the United States Army and Navy, 36 East 36th Street, New York, are to be highly commended for supplying it in part.

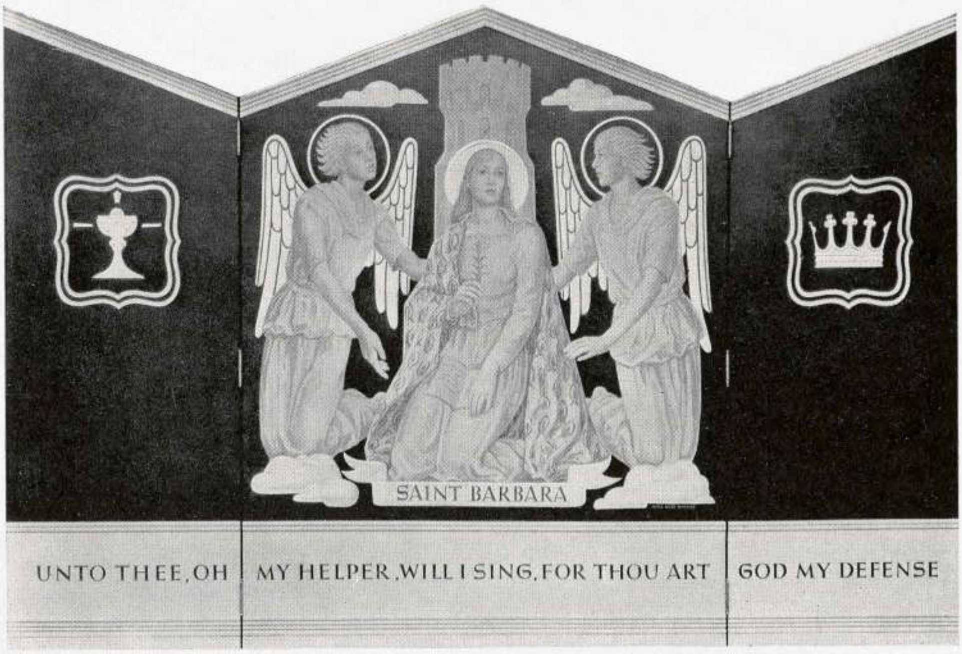
In fetid jungles and concrete barracks, on ice-bound decks and parched deserts, an uplifting strength has often been supplied by the sight of this Committee's beautiful triptychs behind the rough service altars of the military and naval chaplains. It is unfortunate that our naval, military and air forces of Canada have no similar charity. The name triptych may be unfamiliar to some but the triptych has had a long and important history in the art of Europe. This particular type is portable with wings that fold in on the central panel, it is easily set up and transported and forms an ample reredos to any divine service. Many of them have peculiar appeal to those who worship before them. In one, the negro Saint, Benedict the Moor, brings the hope to negro troops that before God, if not before man, all men are created equal. Of those chosen for illustration St. Barbara, the patron Saint of artillerymen, is seen quiet, serene and Catholic in feeling. Jophiel, Guardian of the Truth, in a particularly brilliant colour background is vividly Protestant. None is a copy of the Mediaeval past.

One hundred and seventy-five triptychs have in two years been donated by individuals, churches, and companies at far less than would have been their cost if privately commissioned. They are approximately four feet high and vary slightly in width. The charity is fortunate in its artists who have largely contributed to its success, they are first-class men and work for far less than their services deserve. It was hoped to illustrate several of the designs in colour in the *Journal* but this was found too difficult. Many triptychs are issued as coloured post cards reprinted from the magazine "Liturgical Arts".

Anthony Adamson.

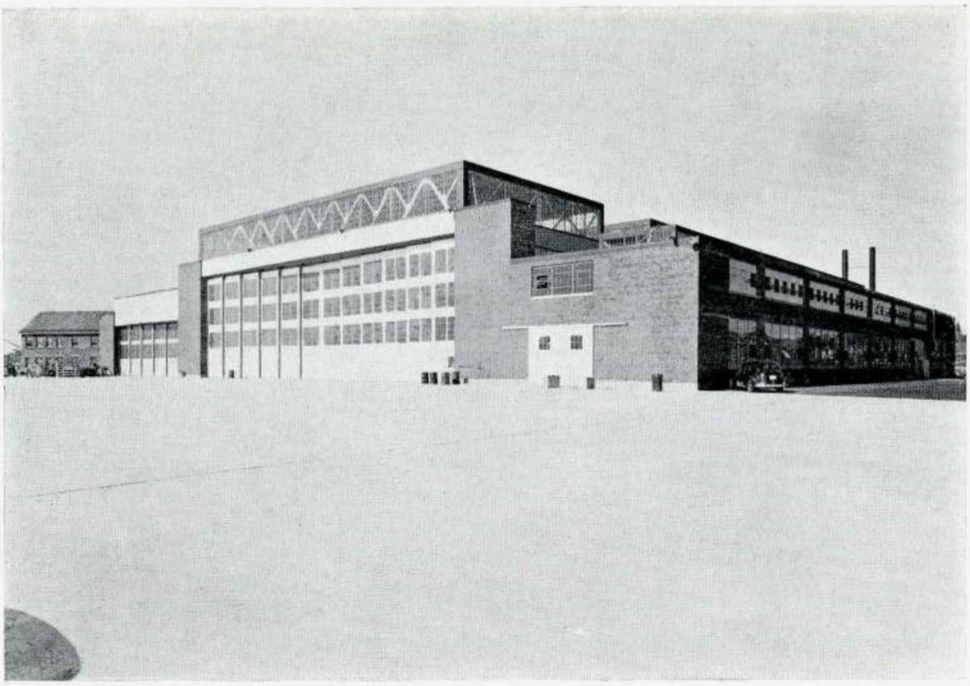
HILDRETH MEIERE
ARCHANGEL MICHAEL
PRAIRIE STATE TRAINING SHIP, NEW YORK

ALFRED JAMES TULK
JOPHIEL, GUARDIAN OF THE TRUTH
CAMP KILMER, NEW JERSEY

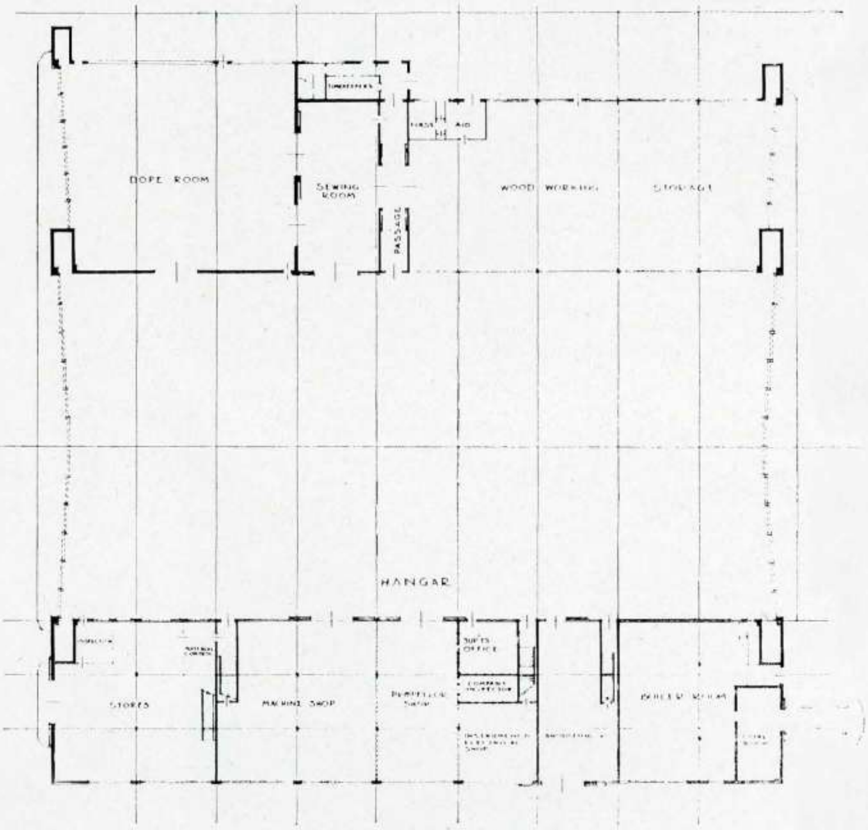


NINA BARR WHEELER
SAINT BARBARA,
PATRON OF ARTILLERYMEN
FORT DUPONT, DELAWARE

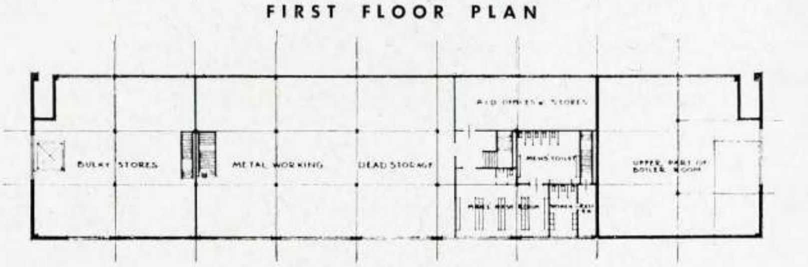
Photos courtesy Citizens Committee for the Army and Navy, Second Region Council, Inc.



OVERHAUL HANGAR FOR THE R.C.A.F.
ROSS AND MACDONALD, ARCHITECTS
C. ST. J. WILSON, ASSOCIATE ARCHITECT
DAVID SHEPHERD, CONSULTING ENGINEER



FIRST FLOOR PLAN



SECOND FLOOR PLAN

MEMBERS ON ACTIVE SERVICE

ALBERTA

Pilot Officer D. A. Freeze, R.C.A.F.
Flight Sgt. P. Campbell-Hope, R.C.A.F.
Pilot Officer F. H. MacDonald, R.C.A.F.
Lieut. Lloyd G. MacDonald, R.C.E., Overseas.
Lieut. John Rule, R.C.N.V.R.
Lieut. John Stevenson, R.C.E.
Flying Officer G. K. Wynn, R.C.A.F.

BRITISH COLUMBIA

Flying Officer R. A. D. Berwick, R.C.A.F.
Lieut. Comdr. S. P. Birley, R.C.N.V.R., Fleet Mail Office, Victoria.
Flying Officer W. H. Birmingham, Instructor in Navigation, R.C.A.F.
Lieut. C. D. Campbell, R.C.E., Overseas.
Lieut. D. D. Carpenter, 10th Fortress Signals, R.C.C.S.
Flying Officer R. Curtis, R.C.A.F.
Lieut. H. C. Hammond, 1st Corps Field Survey Coy., R.C.E.
Lieut. R. R. McKee, Jr., No. 2 Sec. 4th Fortress Coy., R.C.E.
Lieut. P. M. Thornton, Dept. of National Defence Naval Service, R.C.N.
Lieut. J. H. Wade, R.C.N.V.R.
Lieut. W. F. Williams, R.C.E. Wing, O.T.C., W.C., Gordon Head Camp, Victoria.

STUDENT ASSOCIATES

Pilot Officer Robt. C. Bennet, R.C.A.F.
Sub-Lieut. Hugh M. Farmer, R.C.N.
Sub-Lieut. C. P. Jones, R.C.N.
Sgt. Don. H. McCain, Sgt. H.Q., 3rd Division Engineers, R.C.E., Overseas.
Chief Engineer Officer G. D. Maddock, R.C.A.F., Airport Prince Rpert, B.C.
Sgt. A. C. Morton, R.C.E.
G. N. Worsley.

MANITOBA

Lieut. J. A. Chivers, R.C.E., Overseas.
Flying Officer L. Finch, R.C.A.F.
Major H. H. G. Moody, R.C.E., Overseas.
Wing Commander Gordon Ritchie, R.C.A.F.
Flight Lieut. E. W. Rogerson, R.C.A.F.
Capt. H. N. Semmens, Winnipeg Grenadiers.
Col. J. N. Semmens, Winnipeg Grenadiers.
M. Kurnarsky, R.C.A.F.

NEW BRUNSWICK

Lieut.-Col. Wallace W. Alward, 3rd N.B. Medium Coast Brigade.

ONTARIO

Capt. M. F. Allan, 4th Battalion, R.C.E., Overseas.
Sub-Lieut. R. J. K. Barker, R.C.N.V.R.
Flight Lieut. Gordon Bazeley, No. 4 Training Command, R.C.A.F.
Sub-Lieut. Victor P. Belcourt, R.C.N.V.R.
Major John T. Bell, R.H.L.I., Overseas.
Sq. Leader Roy H. Bishop, Technical Training School, R.C.A.F., St. Thomas.
Lieut. Comdr. Richard E. Bolton, R.C.N.V.R.
Capt. J. F. Brennan, R.C.A.
Wing Commander H. J. Burden, Headquarters, R.C.A.F.
Flight Lieut. Cyril J. Carroll, Western Air Command, R.C.A.F.
Lieut.-Col. Ronald W. Catto, Headquarters, Veterans' Guard, Ottawa.
Capt. J. H. A. Collins, No. 7 Detachment, R.C.E.
Lieut. J. V. Connor, No. 10 Basic Training Centre.
Lieut. David L. Cowan, 4th Battalion, R.C.E.
Major James H. Craig, No. 3 C.A.C. Reinforcement Unit, Overseas.
Flight Lieut. E. J. Crone, No. 1 Training Command, R.C.A.F.
Squadron Leader Arthur W. Davison, Headquarters, R.C.A.F., Overseas.
Lieut. H. E. Devitt, R.C.E., Overseas.
Capt. J. Edwardes-Evans, 110th Coy., A.M.P.C., B.E.F., Overseas.
Flying Officer F. C. Etherington, Eastern Air Command, R.C.A.F., Halifax.
Lieut.-Col. A. J. Everett, N.D.H.Q., Ottawa.
Major Richard A. Fisher, Fire Prevention Office H.Q., M.D. No. 2.
Lieut.-Col. W. E. Fleury, 15th Field Battery, R.C.A., Overseas.
Lieut. Logan V. Gallaher, No. 6 Detachment, R.C.E.
Brigadier E. W. Haldenby, O.C. 9th Infantry Brigade, Overseas.
Lieut. H. G. Hughes, O.T.C.
Major L. B. Husband, 25th Basic Training Centre C.A.(B)T.C.
Flying Officer N. L. Irwin, R.C.A.F., Rockcliffe.
Lieut. A. G. Keith (Student).
Sub-Lieut. J. B. Langley, R.C.N.V.R.
Capt. J. W. Leighton, Essex Scottish Reg't.
Sq. Leader Harle B. Long, Western Air Command H.Q., R.C.A.F.
Lieut.-Col. H. H. Madill, C.O.T.C., University of Toronto.
Group Capt. F. H. Marani, No. 1 Air Training Command, R.C.A.F.
Lieut. F. D. Mathias, R.C.A.
Lieut.-Col. Geo. Y. Masson, A33 C.A. Training Establishment, Borden.
Lieut. H. Stirling Maxwell, R.C.N.V.R.
2nd Lieut. H. M. McLaughlin, R.C.E.
Flying Officer D. G. McRae, R.C.A.F. (On Leave).
Lieut.-Col. W. N. Moorhouse, A21 Training Centre, R.C.O.C., Barriefield.
Major R. A. V. Nicholson, No. 3DD Geographical Section, General Survey.
Lieut. G. K. Pokorny, 3rd Battalion, R.C.E., Overseas.
Flying Officer Alvin R. Prack, R.C.A.F.
Flight Lieut. Gordon B. Pritchard, No. 9 Construction and Maintenance Unit, R.C.A.F., Vancouver.
Lieut. W. A. Ramsay, R.C.N.V.R.
Pilot Officer S. G. Richards, R.C.A.F. (Student).
Flying Officer A. C. Rieder, Headquarters, R.C.A.F., Ottawa.
Lieut. H. H. Roberts, R.C.E. (Student).
Lieut. Comdr. John B. Roper, R.C.N.V.R.
Flight Lieut. J. Ryrie, No. 8 Bombing and Gunnery School, Alberta.
Capt. Dyce C. Saunders, No. 2 District Depot.
Capt. R. D. Schoales, No. 2 Light Field Ambulance, R.C.A.M.C., Overseas.
Sq. Leader Gordon S. Screaton, Headquarters, R.C.A.F., Overseas.
Sq. Leader S. K. Sinclair, Headquarters, Eastern Air Command, R.C.A.F.
Major Leonard E. Shore, Central Ordnance Depot, R.C.E.
Lieut. J. E. Assheton Smith, 15th Field Reg't., C.A.T.C., Overseas.
Flight Lieut. Harry T. Smith, Headquarters, R.C.A.F., Ottawa.
Lieut. J. Sugarman, A5 Training Centre, R.C.E.
Lieut. F. O. Templeton, 2nd Battalion, R.C.E.
Col. Mackenzie Waters, M.C., V.D., O.C. 3rd Anti-Tank Reg't., R.C.A.
Lieut.-Col. Hilton Wilkes, Assistant Adujtant General, Pacific Command.
Capt. J. D. Wilson, 2nd Divisional Signals, R.C.C.S.
Flying Officer W. H. Workman, Air Force H.Q., A.M.S. (D.S.A.), R.C.A.F.

PRISONER OF WAR

Lieut.-Col. Douglas E. Catto, Royal Regiment of Canada.

MISSING—PRESUMED DEAD

Capt. John A. Willis, Essex Scottish Regiment.

QUEBEC

Lieut. Comdr. P. C. Amos, Admiralty House, R.C.N.V.R.
Major J. Paul Bastien, Paie-Maitre R. de M., Quartier-Maitre R. de M. Depot, C.A.S.F.
Lieut. Victor P. Belcourt, R.C.N.V.R.
Lieut. Richard E. Bolton, R.C.N.
Sq. Leader E. C. Cox, R.C.A.F.
Capt. Emile Daoust.
Lieut. Harold E. Devitt, R.C.E., Overseas.
André Drolet.
Roland Dupere.
Lieut. Comdr. A. T. G. Durnford, R.C.N.V.R.
2nd Lieut. Milton Eliasoph, R.C.E.
Major N. A. Fellowes, Royal Hussars Regiment.
2nd Lieut. Philip Freedlander.
2nd Lieut. D. K. Gowans, R.C.E.
Capt. Stuart S. Hawkins, R.C.E.
2nd Lieut. H. Gordon Hughes, O.T.C., E.C.
Major Paul Lambert, Etat-Major General, C.O.T.C., Overseas.
Flying Officer Harle B. Long, No. 4 Training Command.
2nd Lieut. Max A. Louis, R.C.E.
Maurice Mainguy
2nd Lieut. Raymond Martineau, R.C.A.
Gerard Masson.
Lieut. F. D. Mathias, 1st Survey Reg't., R.C.A., Overseas.
Lieut. H. Stirling Maxwell, R.C.N.V.R.
Capt. Ant. Monette, I.C.
Pilote Officier Jacques Morin, R.C.A.F.
Lieut. Francis J. Nobbs, 6th Reg't., Duke of Connaught Royal Hussars, Overseas.
Lieut. George W. Peck, R.C.E.
Lieut. John B. Roper, R.C.N.V.R.
Lieut. R. R. Tourville, R.C.E.
Capt. E. W. Tremblay, R.C.A., Overseas.
R.S.M. Gerard Venne.
Sgt. Louis Verreault, R.C.A.F.
Sq. Leader G. Everett Wilson, R.C.A.F.
Sub-Lieut. James Woollven, R.C.N.

SASKATCHEWAN

Flight Lieut. F. J. Martin, R.C.A.F.
2nd Lieut. Dan. H. Stock, R.C.E.

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FABRICATION OF LAMINATED TIMBER MEMBERS

Principles Employed in Design and Manufacture of Built-Up Units

By VERNE KETCHUM, M. Am. Soc. C.E.,

Chief Engineer, Timber Structures, Inc., Portland, Ore.

Use of laminated timber in construction has increased steadily during the last few years. Especially during 1942, with the shortage of structural steel, the rate of increase has been greatly accelerated. Although lumber in various forms has to a large extent taken the place of steel for trusses and building frames, even in steel shop plants, the design and manufacture of laminated members and structures is subject to daily developments and improvements, and many new designs and details will be tested and used. However, some general information on fabrication processes has been established and can be given.

The basic principle in this type of construction is the combination of lumber, adhesives, and other materials to secure a structurally adequate product at a low price. It is not the aim to produce the most excellent structure that can be made, as that would entail a waste of materials, plant, and manpower. The aim is rather to secure reasonable strength by the most economical means.

For instance, where joints in the laminations are outside the section of maximum stress, butt joints are generally used because, though not the strongest type of joint, they are sufficiently strong in this position. It is a waste of lumber, glue, labor, and plant to furnish scarf joints which give 100% strength when this full strength is not required.

Laminated construction using dry lumber has the distinct advantage of producing a member that will not check, warp, or distort after it has been put in place. The lumber is dried in small sizes, providing a better member in a much shorter time. Also, laminated members can have their sizes increased at the critical sections without increasing the size of the entire piece. With this type of construction, curved, cambered, or tapered members, which are pleasing to the eye, can be economically molded or shaped to the design size. These have been used extensively for curved and straight chords in trusses, for two-hinged and three-hinged arches, and for beams and columns.

It is now possible to construct beams of 70-ft. span, wood trusses 200 ft. long, and wood arches 200 ft. or more in span, using glued laminated construction. Columns can be built to take care of combined vertical loads and bending stresses and can be provided with corbels or enlarged ends.

The bowstring has long been considered one of the most economical types of trusses. Prior to the extensive use of laminated construction, it was necessary to build up the curved top chord at the site using 1 or 2-in. pieces and spiking or bolting them together to the desired curvature. Overlapped segmental pieces which had the top side band-sawed to the desired curve were also used. The top chords of these trusses may now be built up using glued laminated construction, which gives the strength and appearance of a single solid piece.

Standard Lumber Sizes Used

Today nearly all laminated construction utilizes either Douglas fir, yellow pine, or hemlock. These species are the most plentiful of those suitable for such construction. The sizes of lumber used depend largely on whether the finished member is to be straight or curved. It is not practical to dry lumber for this purpose in thicknesses greater than the standard 2-in. commercial plank and this is the most economical thickness. Practical experience has shown that the thickness of a lamination should not be more than $\frac{1}{150}$ of the radius of curvature. Such pieces bend readily and do not build up high initial stresses. Lumber of almost any width and length can be used provided that the lateral and horizontal splices are properly staggered and jointed.

Lumber used in laminated construction may be Dense Select Structural or lower grades. A very large percentage at the present time is No. 1 common lumber with a slope of grain of 1 to 10, conforming to Paragraph 215 of "Standard Grading and Dressing Rules" authorizing the use of a stress grade of 1,200 lb. per sq. in. This classification is for ordinary solid lumber cut green and air-dried under ordinary conditions.

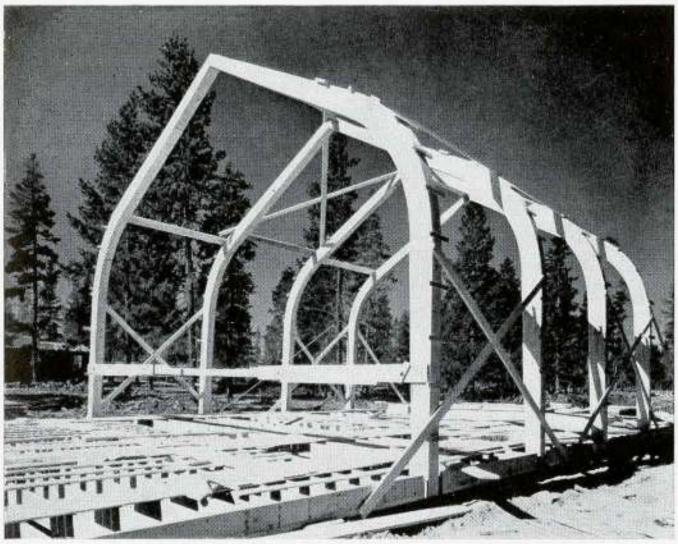
TABLE I.—Values in Pounds per Square Inch, for No. 1 Common Douglas Fir According to Paragraph 215

	Solid—No Guarantee on Moisture Content	Laminated Dry Gluing Stock
Bending compression	1,200	1,400
Direct compression	1,000	1,100
Compression across grain	325	325
Horizontal shear	120	120
Modulus of elasticity	1,600,000	1,600,000

The Douglas Fir Use Book contains the following statement: "In dimension sizes 4 in. and less in thickness, the development of defects during seasoning does not offset the increase in strength from drying as much as in larger sizes, and in these sizes used in dry locations, working stresses in extreme fibre in bending and compression parallel to grain are increased proportionately from equal grades of larger timbers."

This condition applies to practically all laminated construction since the requirement here is for small sizes of dry lumber. It would seem, therefore, that the use of the next higher stress grade or an increase to 1,400 lbs. per sq. in. for laminated lumber under Paragraph 215 would be fully justified. The values given in Table I are those used and recommended by Timber Structures, Inc., of Portland, Ore.

We recommend that the values for other stress grades be increased accordingly. On Government work, specifications allowing much higher stresses for the duration of the war emergency are now being used. Also, some manufacturers use higher stresses, basing their authority on tables given in *The*



AN ARMY CHAPEL SHOWING FOUR ARCHES ERECTED OF 26 FT. SPAN

Glued Laminated Wooden Arch, by T. R. C. Wilson, (U.S. Dept. of Agric., Tech. Bul. 691, 1939).

For wood used in casein laminated construction, the moisture content may be from 10 to 20%, and no close control of this content is necessary to produce good work. A moisture content from 10 to 15% is ordinarily the most suitable. The moisture content of the lumber should be close to what it will attain in the actual structure to avoid a tendency for the glue joint to work during the seasoning process. It has been found that wood under cover in various parts of the United States will under ordinary conditions eventually reach a moisture content of from 8 to 15%. Timber attains its maximum expansion at a moisture content of 28 to 30%, and a greater content does not change the shape or size.

Two general types of glue are used in ordinary laminated construction—waterproof resin glue and water-resistant casein glue. The resin glue, while being as cheap per pound as the casein, and requiring less glue per unit of area, has other disadvantages which have cut down its use. It requires an operation temperature of over 70° F., a higher finish than is found on commercial lumber, more care in spreading, higher pressures, and much more care in all other operations of manufacture. These requirements restrict resin gluing to work done by experts in temperature-controlled factories and prohibit its use at building sites.

Casein glue is now used almost entirely for ordinary construction. It is sold in powder form, usually in barrels, and must be stored in a dry place. One pound of the powder is usually mixed with two pounds of cold water to form from 1½ to 2 quarts of glue mixture, which will cover about 35 sq. ft. of surface. Small gluing operations can be done with a standard 12-quart pail but large ones require a mechanical mixer. In small operations the glue may be applied to the lumber using a 3-in. brush or larger, made of stiff vegetable fibres which will withstand the alkaline action of the glue and retain sufficient stiffness for efficient spreading. On large operations it is almost necessary to have a mechanical spreader. It will also be necessary to have a number of strong clamps for applying pressure. A sufficient number of clamps will have to be used to allow them to remain on the pieces until the glue has properly set.

Mixing of casein glue is usually done in a large tank by mechanical means and should be under the control of one man only per shift. The glue powder should be added slowly to the water and mixed for some 3 to 5 minutes until the mass thickens. The mixer should then be stopped and the mass allowed to rest for 15 minutes. After this it should be again mixed for 2 to 3 minutes until it smooths out like heavy cream, ready for use.

Casein glue remains liquid and usable for a period of 6 to 8 hours at 70° F., and 4 to 6 hours at 90° F., but it gradually thickens into a rubbery mass which must be discarded. Therefore only enough should be mixed at one time for one working shift.

Mechanical Application of Glue

Glue is spread on the lumber with one of the standard types of spreaders which have been in use in various mill working plants for years. The spreader consists of sets of motor-driven rolls which revolve in a tank of glue and apply the glue to the board as it passes between the rolls. The rolls, being corrugated and under light pressure, apply a thin film to one or both sides of the board, as required. Depending on assembly time, moisture content of wood, and working temperature, sufficient glue should be applied so that the film will be moist when the pressure is applied. An ordinary lumber carrier can be used to move up the raw materials and to take away the finished product.

The working temperature for casein gluing may be anywhere above 50° F., either for indoor or outdoor work. The glue and lumber should be about the same temperature, and the water should be between 60° and 75° F.

After the glue has been applied and the lamination put in place, it is necessary to apply pressure to the member. This may be done by either of two methods. The first consists of driving nails long enough to extend through at least two full laminations. Sufficient nails should be used so that for each 8 sq. in. of glued joint, there is at least one nail passing through a lamination on each side of the joint. For example, when laminating boards 2 in. thick, there should be one 20d. nail head for each 8 sq. in., or one 60d. nail head for each 16 sq. in. The other method of applying pressure consists of the use of standard clamps, which may consist of a commercial type of C-clamp or a homemade clamp using angles and bolts. Where laminated work is manufactured in a shop, the usual practice is to use nails only to hold down the ends of pieces, and to employ clamps for all the rest of the work. At the building site, where clamping equipment is not often available, nails are used entirely, as this method lends itself readily to use by inexperienced workmen with meagre equipment. Practice has shown that it is better to use clamps throughout, even on the ends of pieces, than to use nails. It is the opinion of experienced manufacturers that the nailing method is inadequate to develop the pressures necessary for good work.

The pressure on glued joints should range from not less than 100 lbs. per sq. in. to not more than 200, and should be applied by the use of jacks, clamps, or other equipment. Pressure should be applied within 20 minutes after the glue is spread on the lumber if it is applied to both faces meeting at a joint. If the glue is applied to one face only, the pressure should be applied within 15 minutes and should be maintained for at least 6 hours after the addition of the last lamination. As a general rule, the pressure should remain on the finished piece from 6 to 12 hours, depending on the moisture content of the wood and the temperature of the operation.

Several Types of Joints Used

Scarfed joints may be formed in several ways, either by using a straight tapered bevel for both ends of the jointed members or by using various combinations of daps and bevels. Tests made by some authorities have indicated that a scarf with a straight bevel from 1:8 to 1:15, depending on the kind of wood used, will produce a full-strength scarf. It is recommended that a standard of 1:12 be adopted. Four types of joints are shown in Fig. 1.

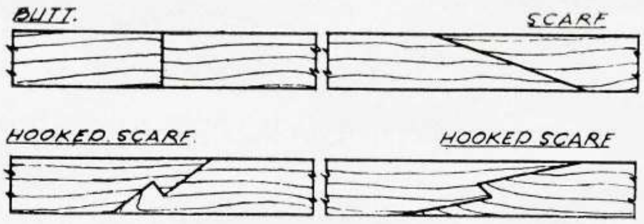


FIG. 1. FOUR TYPES OF JOINTS FOR LAMINATED MEMBERS

The location of scarf joints in compression members is not very important, and providing the two ends are in bearing no loss in strength results. A good bearing between butt joints, however, is very hard to obtain. For members in tension, such as the bottom cords of trusses or the tension side of beams, either the laminations must be scarfed and glued to full strength, or the loss of strength in the lamination must be taken into account in the design.

It is apparent that the laminations of beams which are spliced in areas of no tension can be butt-jointed without loss of design strength. Similarly, in areas of small tension, some laminations can be butt-jointed. In areas of high or full tension stress, however, lamination splices should be scarfed for full design strength. By careful arrangement, it would seem that in most cases all laminations could be butt-jointed and such joints located outside the areas of high tension. While the locations mentioned are more or less arbitrary, it should be recalled that nearly all beams are designed by arbitrary methods, and lamination splices may be considered in the same way.

A consideration of the distribution of stress through a beam will show that a lamination near the quarter point of the depth of the beam has a working value of only about $\frac{1}{3}$ that of a lamination at the top of the beam, and a lamination at the centre has practically no working value in tension or compression at all. It is thus apparent that a lamination in the middle of the beam may be composed of lumber having a lower stress grade, or may be butt-jointed with a relatively small loss of strength to the beam.

Since the maximum bending moment in a beam under static load occurs at one point only, the full design strength is required only at that point. In a beam of uniform section there is a reserve of strength in all other parts. Speaking now only of bending moments, we find that the full strength of a lamination in tension is required in only one lamination at only one point, and that is the extreme lamination on the tension side at the point of maximum bending moment. The reserve of strength in the remainder of the beam may be taken into account when considering splices and the stress grade of lumber to be used. Of course the stress grade of the timber will also have to be considered for the lamination under extreme compression at the point of maximum bending moment.

Authorities recommend that unscarfed joints be not closer together longitudinally than 40 times the thickness of the lamination so that there will be sufficient length for the proper transfer of the stress around the joint. It is also recommended that scarfed joints be placed not closer together than 25 times the thickness. Wherever possible, the outer lamination should be in one piece, but if not, at least it should extend in one piece across the section of maximum stress, as it is very difficult for the full stresses in the outer lamination to be transferred around a splice All joints in curved members should be scarfed, as otherwise it is almost impossible to hold the jointed ends in position to form a satisfactory member. Some manufacturers scarf-splice all laminations in advance of assembly. First, the ends of the boards are scarfed and glued to form a lamination the full length of the member. When dry, this lamination is run through a planer to bring the scarfed joint to the same thickness as the remainder of the lamination. This planing is usually necessary as the ends of scarfed joints tend to "ride up" on each other, producing a thickening in the splice. Such a splice, if placed in the member without planing, would produce a bulge and adjoining opening. These laminations may then, of course, be treated the same as a full-length lamination without scarfs and can be assembled into the member to produce a very satisfactory although more costly unit.

Thus two methods are available—the pre-glued scarf lamination just described, and the method of placing all the laminations directly in the member and gluing all the boards and joints in one operation. The choice between these two methods may well be based on the type, cost, and quality of the structure. Some successful manufacturers use the plain pre-glued and planed scarf-joint type throughout in preference to the butt or stepped scarf-joint and maintain that they are able by this means to produce a better product at little or no additional cost.

Many designers have insisted that steel stitch bolts be placed at short intervals through glued laminated members to help hold them together. These bolts are apparently intended to bolster up the strength of the glue for fear it will fail after the structure has been put together. We believe that glued, laminated construction as built during the last few years has given such satisfactory results that this lack of faith in glue is entirely unwarranted.

It is very hard to hold the extreme end of a lamination to a predetermined curve, and curved members will tend to straighten out slightly when the clamps and forms are removed. This springback is not great, but may sometimes be $\frac{1}{4}$ or $\frac{3}{8}$ in. in a 40 or 50-ft. truss cord. It seems to require some experience to forecast the amount of this springback, which can only be prevented by slightly distorting the curve, that is, by slightly accentuating it at the ends, from a point 3 or 4 ft. back.

Preparation of Lumber for Gluing

All surfaces to be joined by gluing should be finished or machined; rough lumber should not be used. With casein glue, the ordinary finish such as is found on commercial 2-by-4's and 2-by-6's is satisfactory. The lumber to be used should be free of grease, dust, and dirt. To produce a good finish on the assembled member, exposed surfaces may be planed or sanded. Such finishing may be done as soon as the glue has hardened. An ordinary floor sander has been used for this work. Where it is intended to plane or sand the finished top chord of trusses or other members, the changed dimension should be considered in the design and in the detailing of any adjoining connections. For example, a top chord built up out of 2-by-6's would have a lateral dimension of $5\frac{1}{2}$ in. assembled, but after planing it would be cut down to approximately $5\frac{1}{8}$ in.

From experience to date, it seems safe to assume that casein-glued laminated construction will last as long as solid wooden members of any but the more durable species or treated material. The longest experience for glued fabricated construction in the United States is about six years, and 30 years for built-in-place structures. The characteristics of casein glue render it unsuited for use in members in contact with damp earth or where the moisture content of the wood may repeatedly exceed 20%. Properly made glued joints on all woods commercially used for construction framing have a shear strength of 1,000 or more lbs. per sq. in. This means that under extreme strain breakage would be in the wood rather than in the glued joint. Test pieces used by the glue manufacturers must be made of hard maple in order to secure any breakage in the joint.

Fireproofing treatments consist of impregnating the wood with various salts and compounds under pressure in sealed cylinders. During the treatment the moisture content is increased to between 60 and 75% under a pressure of 100 to 160 lbs., and the temperature is 125 to 175° F. Glue manufacutrers claim that casein-glue joints will maintain 100% joint value during any known fireproof treatment but that casein glue cannot be applied to lumber that has previously been fireproofed. Laminated members using resin glue will not stand up under fireproof treatment, but resin glue can be applied to lumber that has previously been fireproofed.

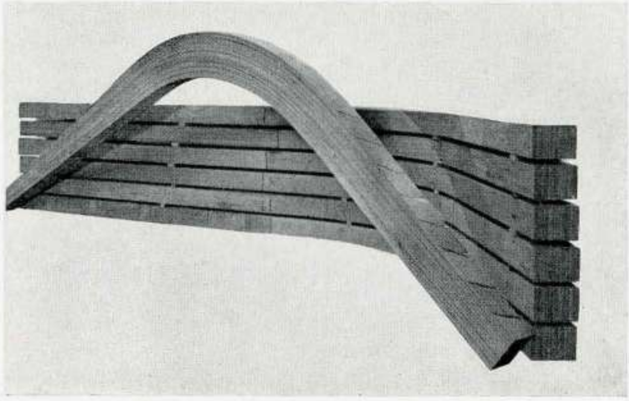
Glued-up laminated members using resin glue cannot later be treated by the Wolmanizing process of preservative treatment, but finished members using casein glue can later be treated by this process. Casein glue cannot be used on laminations that have been treated by the Wolmanizing process, but resin glue can be. Laminated built-up members can receive preservative treatments using a creosote base, but laminations that have been treated with a creosote material cannot be later glued either by resin or by casein glue.

At present, laminated construction is somewhat more costly than solid construction. Quotations for some recent jobs would indicate that the construction costs of laminated material delivered to the job were about 35% higher, per thousand board-feet, than those for solid construction. The laminated construction gives a superior product and often this higher cost is justified. Also, laminated construction often permits the construction of larger structures and longer spans than would otherwise be feasible. Connecting hardware, ironwork, assembly, erection, engineering, and general overhead are the same for both types of construction.

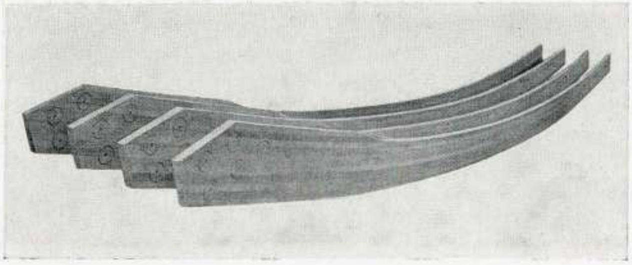
Where members are glued up at the site, they may be finished to any size which can be erected by the available equipment. Where they are built at a shop, at a distance from the site, splices must be used so that the pieces can be transported. It is usually not practical to transport pieces larger than 8 by 40 ft. on railroad cars, and highways have overhead clearances and legal restrictions that must be considered.

Laminated construction requires the very minimum of bolts, connectors, washers, and other steel items, and often avoids the use of steel entirely except for anchorage details. While laminated construction is relatively new in this country, the design follows old established principles, and the proper manufacture can be easily and quickly learned by men experienced in other lines of building construction. Both laboratory and field tests give conclusive proof of the usefulness and durability of this type of construction, and conservative owners and engineers should not hesitate to use it.

The accompanying photographs show typical laminated members and illustrate steps in their fabrication. Further progress in glue manufacture, and the development and simplification of fabrication processes, are continually improving this product and reducing its costs.



GLUED-LAMINATED ARCHES FOR A CAFETERIA BUILDING MADE UP OF ⅝ IN. KILN DRIED LUMBER WITH 27 LAMINAE AT THE ELBOW AND GRADUATING TO 13 LAMINAE AT THE TOP AND TO 19 AT THE BASE. SECTIONS ARE JOINED AT THE TOP MAKING A 23 FT. 11½ IN. RISE.



60 FT. END SEGMENT OF GLUED-LAMINATED TOP CHORD FOR 160 FT. ROOF TRUSS. NOTICE BEARING END OF CHORD IS INCREASED FROM 9 TO 11 LAMINAE.

LETTER TO THE EDITOR

We publish below part of a personal letter to the Editor of the "Journal", because we think it will be of interest to many of the writer's friends in the profession. It comes from Colonel Mackenzie Waters, M.C., V.D., B.A.Sc., F.R.A.I.C., who has been on Active Service since September, 1940.

The Journal comes regularly and I really enjoy getting it. Until I came to my new command, I passed it on to Eric Haldenby and now to Jim Craig who is stationed in one of my camps. It might be an interesting item for the *Journal* to know that last Saturday, 27th March, the Royal Institute of British Architects asked a group of overseas architects to 66 Portland Place for a reception and buffet luncheon, after which we went to an exhibition at the National Gallery, designed to get the public thinking along the right lines as to the rebuilding of Britain aprés la guerre. It was cleverly set up and a full house was deeply interested.

Among the Canadian architects I saw were Jim Craig, Keith who was in Bermuda, Ross, once with Craig and Madill, Davidson of Brockville, Jim Wilson of Darling and Pearson and more lately Mathers and Haldenby. Gibson of Chapman and Oxley, and many I didn't know from Montreal and other places. The President of the R.I.B.A. was absent so the bow was taken by Howard Robertson of Stanley Hall, Easton, etc. I had met him before and he has taken me to lunch at the A.A. where I sat beside Holden of Underground fame. A Miss Nichols told me she had gone to the A.A. with Dick Saunders. Although not directly hit, 66 Portland Place has suffered severe concussion and I feel has stood up remarkably well—hardly a plaster crack. Sir Ian is in good shape and couldn't be more charming.

I am extraordinarily well and still able to take my share.

As ever,

Mack W.

THE PROVINCIAL PAGE

ALBERTA

By the time this letter is published it is fully expected that the 250 Wartime Houses now being erected in Edmonton will have started to flow into occupation. This means that that number of families will be comfortably housed next winter. We should like to feel that some thousands more could be as well served.

Attention may well be called here to a report on city planning that has been given a fairly wide circulation. It consists of a series of recommendations by the Young Men's Section of the Winnipeg Board of Trade. The proposal there suggested to create a regional planning board that shall override municipal authorities is probably inadvisable, but in other respects the report is an excellent one and does great credit to the committee that has produced it. The outline of the town planner's duties is particularly good and worthy of the attention of the committee of the R.A.I.C. on town planning. It is very encouraging to find so representative a body of young men exhibiting so much interest and so intelligent a view of the town planning problem.

In our planning for the future it will be necessary, in order that such planning shall be efficiently operated, to improve the ways for operating it. All our cities have a good framework for the purpose, but probably most of them fail miserably in its operation. We have city councils whose function is considering and framing civic by-laws. These councils have their chairmen of committees whose work resembles that of cabinet ministers on a civic scale but, as a rule, they do not deliberate sufficiently as a cabinet. Then we have the city officials at the heads of various departments of city work. These are analogous to deputy ministers carrying on the administration. They are men permanently in charge of important branches of service and are technically expert, each in his own sphere. The chairmen of departments ought to look to them for detailed information and to frame their personal activities upon that information. Too often they fail to inform themselves sufficiently and therefore their best intended efforts are futile. The older hands learn some wisdom in this respect, but new brooms, who think they will do some clean sweeping, fail to realize the necessity for this co-operation, with the result that they soon retire from what they find is a series of hopeless efforts, only to make way for more new brooms who act and fail in a similar manner.

Further, there is too little cohesion and co-operation among the paid heads of the various departments. They should frequently meet together with one another and with the chairmen of committees for discussion. Too little of this is done. In small towns all this co-operation takes place quite naturally, for all are personal acquaintances. Thus we find little towns which manage their affairs very successfully. But as towns grow larger this co-operation and cohesion is apt to be lost; yet it is becoming every day more necessary owing to the increasing complexity of civic services.

Now, the town planner must be an expert, a head of a civic department in full co-operation with all other departments and with the council; otherwise his information will be insufficient and his efforts will be futile. He must also adopt a procedure which will keep him in direct touch with the public. For if new and better lines of development are to be introduced in our cities it is necessary that the public be kept well informed as to the intent and purposes of these reforms. In the past, through the lack of this, too few of the general public have taken a serious, intelligent interest in town planning (Winnipeg's young men are an honourable exception). Without such general interest town planning can only be something imposed on a city without the backing of its citizens. With good publicity and information as to objectives, public interest can be enlisted and will give life and soul to genuine city improvement.

The field of service of a skilled town planner is very wide for it concerns the business, the residential, the recreational needs of all citizens and, beyond all that the good appearance of the city. Consider the general appearance of any of our business streets. Who else but a skilled town planner is in a position to create improvement in that very important matter which at present suffers such total neglect? In what sphere would a town planner with any soul be more interested to make his influence felt? If he made his views known, rubbing it in if necessary, would he not be referred to by members of the public who knew they were consulting a man who was anxious and capable of furthering his and their own interests in this respect? He is the only possible co-ordinator of their varied requirements.

Cecil S. Burgess.

ONTARIO

This Ottawa writer would indeed like to gaze out across the river from Parliament Hill and, as Mr. Gladstone Evans suggests, "wax rhapsodical" in contemplation of the Gatineau hills distantly merging themselves into the Laurentians. But a greater urge to do a little in the way of introspection compels him to cast his eye back upon the city itself, this Capital City of the Dominion of Canada, where nature cannot be said to have withheld her lavish hand in providing all that could be desired by way of a fine setting. And perhaps taking all things into consideration—the modern critic to the contrary as is his just right, but more often his fashion—man has not done too badly either, up till now. Nevertheless, like Nehemiah of old giving Jerusalem the once over, this scribe feels heavy at heart and despondent as he looks almost in vain for any sign of progress on the pre-arranged planning for the City's ultimate destiny, that of being a City Beautiful of the North worthy of being the capital of a great Dominion. Instead, and as if in mockery, he sees countless temporary buildings cropping up here, there and everywhere. They are wood buildings, many of good design and pleasing if properly maintained, but nevertheless they are of wood, and wooden structures in the heart of the city are forbidden by by-law! There is a war on, however; the buildings are a dire necessity; and that's that! The City Fathers and citizens all must bow to the inevitable.

Notwithstanding, those who love Ottawa and feel a wider than purely parochial interest in her are alarmed, and have cause to be, for fear that this wartime emergency of bringing forth a city of wood may irreparably affect the future of Ottawa for a great many years to come. These wood buildings are labelled "temporary" but in most cases their foundations and basements are of good solid concrete and it is likely that many decades will pass before they are demolished—in many cases the very fact of their being well designed will militate against their early demolition to make way for structures of more permanent material and may encourage a reluctance to carry on with the larger conception of a definite city plan decided upon. Remarks made upon this subject not many weeks ago in Parliament, by the Minister of National Defence, were not encouraging. We may be fortunate for the time being in having a Prime Minister who is not unmindful for the architectural future of this City but again it is our misfortune that his time is necessarily taken up with the presently more important work of carrying on the business of a nation at war and it must not be forgotten that he will not always be at the helm. The thought of having at the head some strong legal, financial, military or even an engineering genius instead is not comforting.

Surely no community should be entirely dependent upon the enthusiasm or otherwise of its Prime Minister for its architectural progress. For this reason would it be too much for the architectural world, led by the R.A.I.C., to urge upon the Federal Government the creation of some such body as a Ministry of Town Planning and Fine Art under whose authority such matters as the planning of our large and small cities alike, and in particular the Capital City of the Dominion, would fall. Such a Ministry would not supersede existing departments of Government but rather would be the administrative backbone of a master plan with which all subordinate agencies would naturally have to co-operate. One can foresee all sorts of difficulties cropping up in the way of Provincial and Municipal rights, but would they be insurmountable? In this way a certain continuity of progress would be established without the danger of spontaneous enthusiasm for some well thought out town planning scheme being allowed to die away and be pigeon-holed for some future generation to discover when too late for same to be carried out except at enormous expense.

"Ottawa Scribe."

THE ARCHITECTURAL COURSE AT McGILL

The task of Canadian architects, in regard to the post-war reconstruction of economic and social life in this Dominion, is widely recognized at this time. Although Canada has not suffered, and we hope will not suffer, the devastation which aerial bombardment has inflicted upon the cities of Great Britain, it is apparent that the attainment of the ideals set forth in the Atlantic Charter demands of us a major building programme. Our slums must be eliminated, thousands of new homes must be built in town and country, hundreds of thousands of homes must be modernized and improved. On a wider canvas, we must plan for the better development of towns and rural communities; we must provide school buildings that reflect more accurately the knowledge that we have gained of public health and child psychology; we must provide hospitals and universities adequate to meet the demonstrated needs of our growing population.

All of these things will not be accomplished in a brief period. Our plans must extend far into the future and we must train men and women who can, throughout long lives, assume the responsibility for carrying these plans into effect. The new curriculum of the School of Architecture at McGill University, which has been formulated by Professor Bland and his colleagues, represents an effort to train architects along lines that will enable them to play a leading part in the building of a better Canada.

F. Cyril James.

The new curriculum has been arranged to give more attention to the basic sciences of modern building. The change implies a much closer association with the Engineering Faculty in which the School has until now been a separate unit. In the future students desiring to study architecture will be required to take the regular first year in Engineering, and in this way adequate mathematics, physics and chemistry will be added to the course. This will make it possible for students in architecture to proceed with the civil and mechanical engineers in their study of the structure and equipment of buildings.

The subjects of the second year will be: Building Construction; Materials of Construction*; Freehand Drawing; Draughting and Rendering; Mapping* Engineering Reports*; General Geology*; History; Calculus*; Mechanics*; and Surveying*. Following the second year examinations in April there will be a drawing and sketching school for a period of four weeks.

The subjects of the third year will be: Building Construction; Design; Freehand Drawing and Rendering; Aesthetics; Sociology; Planning; Economics*; History; Elements of Structural Design*; Foundations*; Strength of Materials*; and Mechanical Engineering and Laboratory*. Following the third year examinations four weeks will be devoted to an architectural design problem.

The subjects of the fourth year will be: Design; Freehand Drawing and Rendering; History; Accountancy*; Acoustics; Heating and Ventilating; Electricity; Plumbing; Sanitary Science*; Theory of Structures*; Strength of Materials*; and again following the examinations in April four weeks will be devoted to an architectural design problem.

The subjects of the fifth year are: Design; Modelling; History; Engineering Law*; Professional Practice and Specifications.

In each year following the first year an essay, on an historical or current architectural question, will be required and in the summer vacations students will be obliged to obtain practical building experience and to prepare a detailed report* of their particular work.

Subjects marked* are taken jointly with the Engineers.

The Architectural and Engineering students in consequence of these revisions will be brought into much closer contact, and it is expected that this association will be a benefit to both groups. It has already been suggested that the Engineers might find the architectural courses in Professional Practice, Aesthetics, and Planning to be useful to them and there may be other ways in which co-operation will be valuable.

Paralleling the changes in the course, the accommodation of the School is being altered to relate it more closely with the Engineering departments. The architectural museum of plaster casts is being converted into a joint Architectural and Engineering working Library, and the present separate architectural library will house an exhibit of architectural and engineering materials.

It is expected that these changes will provide an academic training far more scientific than formerly and in greater sympathy with contemporary architectural opinion. But in order that the strict disciplines of the sciences should not overweight the curriculum, new workshop courses in abstract drawing, rendering and photography have been introduced under the direction of Gordon Webber, and new courses in the History of Art, Aesthetics, Drawing and Sketching have been arranged under the direction of Mr. Lismer. Professor Bland will direct the History courses in all years. Mr. H. L. Fetherstonhaugh is continuing in charge of Design, and Mr. H. R. Little will continue to conduct the courses in Building Construction and Specifications. Mr. J. C. McDougall will lecture on Professional Practice.

John Bland.