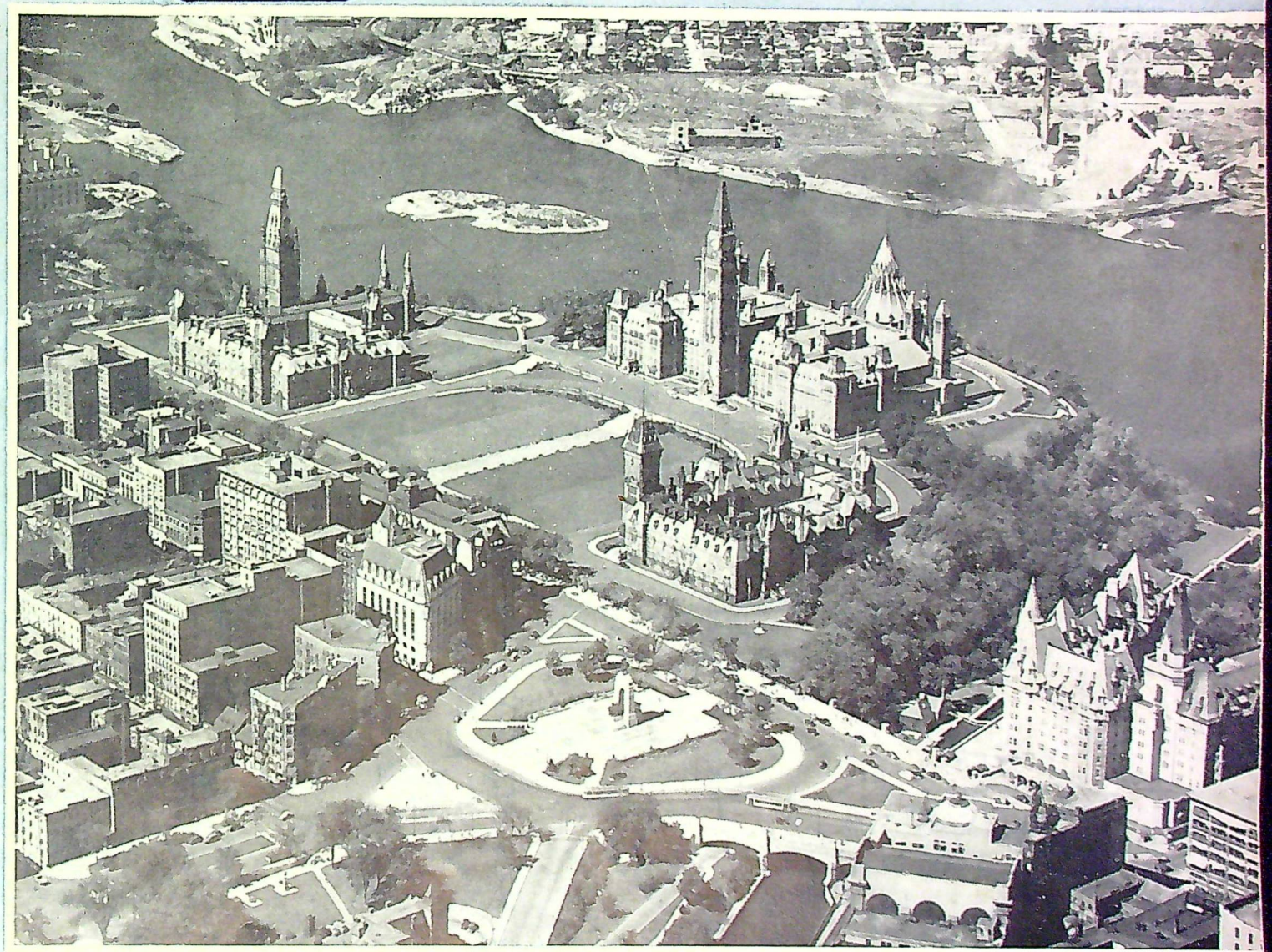
The ROUNDEL

VOL. I, No. 12
OCTOBER 1949



ROYAL CANADIAN AIR FORCE

The ROUNDEL

Issued on the authority of
THE CHIEF OF THE AIR STAFF
Royal Canadian Air Force

VOL. 1, No. 12 OCTOBER 1949

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EDITORIAL

ARTICLES

REGULAR FEATURES

MISCELLANY

EDITORIAL OFFICES:
Room 3130, D.N.D. Bldg. "B,"
Ottawa, Ont.

Sgt. Shatterproof Girds His Loins

Sir:

There is a time when the sword must leap from its sheath, and there is a time when it must be laid aside and give place to words of reason. There is also a time, however, when the strong man must gird his loins and stand in watchful silence, his hand upon the hilt. That, sir, is my present stance. I would ask the Brass to bear the fact in mind.

"What," you may well ask, "has re-awakened the sleeping lion?" The answer is not far to seek. You have only to pick up the September issue of "The Roundel" and turn to the alleged comic strip on page 47. The title is all too appropriate: no view could be quite as dim as the view I take of "The Dimmer View." For here is the thin end of a wedge that may well end by robbing the boys in the field of the only privilege they still have left —their privacy. Hitherto they have at least been permitted to drag out their hopeless lives unseen by the world, but henceforth even this consolation is to be denied them. Let the Brass have a care! Loyal and uncomplaining though the boys in the field may be, they have their breaking-point.

Nor is the loss of privacy the only danger to be considered. There exists also the hideous possibility that many of our younger and less stable personnel may be seduced into becoming mere seekers after cheap publicity. L.A.C. Bladder is already behaving strangely. Brilliant brain though the boy has, he is none the less still untried in the furnace of experience. His unexpected rôle in "The Dimmer View" seems to have dazzled him. Cpl. Spyder advises me that he (Spyder) recently surprised him (Bladder) standing in a Shakespearian attitude and declaiming some rather rough bits from "Anthony and Cleopatra" in front of the mirror in "A" hangar washroom. From there it might easily prove to be but a few steps to the degradation of the footlights. I repeat, sir: let the Brass—and tracy—have a care!

Passing on to less distasteful subjects, I must thank you for having forwarded me the letter from Sgt. Snag. Well do I recall that gallant N.C.O. during his sojourn in this country, and I am proud to have been able to call him friend. As is always the way when forceful characters meet, we instantly recognized each other's latent strength—so much so that he used to refer to me as his "old cock-sparrer," which I understand to be the highest compliment that an Englishman of the old school can pay. Few men have done more than Sgt. Snag to cement the bonds of Empire, and his sudden recall to England (following the incident of the grass-snake in Flt. Lt. Hornet's dictaphone cylinder) was a great loss to progressive Service thought in the R.C.A.F.

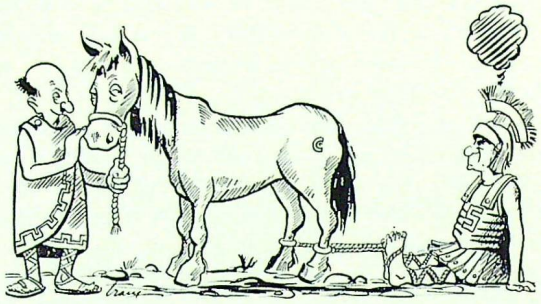
Snag's rich and unbridled humour on the parade ground was a source of constant delight to all the Station's senior N.C.O.'s, but even more remarkable, from an artistic point of view, was his rare gift of song. Indeed, it was as the sweet singer of the R.A.F. that I last saw him, on the eve of his departure. There he stood, straight as a ramrod, in his usual place beside our Mess bar. His faithful tankard was clasped in his hand, and he was swaying imperceptibly to keep time with his own singing. Only someone who knew him as intimately as I did would have noticed that his eyes had been drawn a little out of focus by emotional strain. The song he sang was a nostalgic number from his early Service days. It told of a troopship about to leave Bombay, heavily laden with old worn-out airmen returning to die in their native land, yet still summoning up enough strength to bless all the Sergeants, Warrant Officers and Corporals whom they were leaving behind. It told of the

terrible last-minute warning about promotion uttered by the broken men on the ship as it pulled out, and of their erstwhile comrades on the dock creeping back to their barracks in the sweltering heat of India. All this it told, and more; and then at last it ended with a "Bless 'em all!" so fervent that it woke up W.O.1 Gallstone in the married quarters nearly half a mile away. It was generally agreed later that the farewell party for Sgt. Snag was one of the most affecting functions ever held in the Mess. And it was typical of that iron man's self-control that, when eventually we saw him to his train, he seemed to be the least affected of us all.

When I visited your office last month and found that you were away on leave, I took the liberty of glancing through your October "copy" file. As usual, there was not much in it to interest either myself or any other right-thinking member of the Service, but one item did, I admit, catch my eye: Sgt. Blain's manuscript on discipline. Quite apart from its intrinsic merit, it appealed to me because of the part played by a member of my own family in the events of the period with which the article chiefly deals.

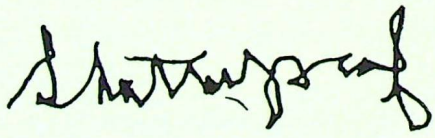
As Sgt. Blain would no doubt be the first to confirm, the name of Semper Absentius Shatterproof the Centurion was a byword wherever the Roman Eagle flew. He was prominent both in the field of literature and of science. In addition to editing "The Slaughterhouse" (the official organ of the 120th "Panzer" Legion), he invented the caterpillar chariots from which the 120th derived its name, and was also one of the world's first aviation pioneers. It was, in fact, his devotion to flying that finally brought about his end.

After the battle in which Caesar was very nearly defeated by Dimwitorix, King of the Clotts, Semper Absentius found himself called up before a Court Martial. The Brass, unimaginative as ever, had come to the conclusion that his unsuccessful attempt to take to flight early in the engagement had not merely served no sound tactical purpose, but that it had even jeopardized the day. He was therefore attached by the legs to the swiftest steed in the Roman cavalry, which was then stimulated into record-breaking activity by the application of a spearpoint to its hind-



quarters. So great was the horse's speed that my distinguished ancestor became airborne within less than a hundred paces. Ten miles later a returning patrol saw him executing a rapid series of tail-first landings on the stony bed of a dried-up creek. Although he was probably in rather poor shape by that time, he was nevertheless still a Shatterproof. As he disappeared for ever in a cloud of dust, he was heard to cry out: "*Ave atque vale, Caesar!*"—which, loosely translated, means: "An airman's farewell to you, Caesar!" In his hour of death Semper Absentius had, perhaps excusably, forgotten his discipline—but he had achieved his life's ambition and at the same time added yet another glorious episode to the family saga.

I remain, sir,
sincerely yours,



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R.C.A.F. STATION, ROCKCLIFFE

by R. V. Dodds, Director of Public Relations, R.C.A.F.

Ottawa Air Station (as R.C.A.F. Station, Rockcliffe, was originally called) came into being very shortly after the end of the First World War. Yet, curiously enough, although new types of aircraft have come and gone, and although some of the fledgling pilots who flew from its aerodrome in the early '20's are now Air Members, the Station's activities have remained unchanged. In 1949, just as more than a quarter of century ago, they still centre around three things—air transport, aerial photography, and flight research.

The Station

The Commanding Officer of Rockcliffe Station is Group Capt. M. G. Doyle, a reserved New Brunswicker who, during the war, served on coastal command squadrons in Canada and in No. 6 Group overseas.

Since the Station is also the home of Air Transport Command Headquarters, its functions tend to be slightly overshadowed, in the eyes of the uninitiated, by the more "glamorous" Command activities. But it should never be forgotten that Command could not operate with its present clockwork precision were the house it inhabits not kept in perfect order. To keep it in such order is the chief duty of Group Capt. Doyle and his staff.

The task is not an easy one. It entails the supervision of all buildings and construction, the discipline and personal problems of almost 2000 human beings, the education of Service personnel, their recreation, and so on *ad infinitum*. Those who have never been called upon to assume responsibilities of this nature cannot imagine the endless difficulties that must be faced and dealt with, and the unfailing watchfulness that is demanded. Group Capt. Doyle, however, has every right to be proud of his Station and of the officers and airmen who help him to administer it.

Not the least of the facts contributing to his satisfaction at the present time (and also to that of the C. Ad. O., Sqn. Ldr. T. H. Spear—generally known as "The Mayor of Rockcliffe") is the approved project of an additional 200 married quarters—with more to come.

Pending the completion of this accommodation, the Rockcliffe trailer camp continues to hold out against the elements. Occupied by almost a dozen Service families, it is located in a shady grove of trees. A central hut has been provided containing showers, laundry room, toilet facilities, and locker space. The trailers are of all types, but the gleaming land-cruiser built by its owner, Sgt.

Group Capt. M. G. Doyle

Sinkinson, dominates them all. Some of the occupants have become such confirmed trailerites that their slogan is: "Houses or no houses, a trailer's the only thing!"

Two of the Station's other responsibilities not already mentioned, are the Practice Flight and the Station Hospital. At the Practice Flight, chair-bound pilots from A.F.H.Q. and A.M.C. Headquarters keep their wings in working order. Officers are allotted set days and times for practice on the Flight's Harvards and Expeditors, and (traditional jokes apart) most of them put up a very good show. Last Air Force Day a group of them thrilled visitors to Rockcliffe with a demonstration of formation aerobatics which must have brought a glow of pride to the officer in charge of the Flight, Flt. Lt. J. W. Fiander—who, incidentally, was himself engaged in flying an A.F.H.Q. desk prior to his present posting.

The hospital at Rockcliffe Station takes care of all Armed Forces personnel in the Ottawa area. Presided over by Wing Cdr. D. G. H. Nelson, it is one of the best-equipped hospitals in the whole Service. In addition to fulfilling its normal rôle, it also operates a training centre for medical assistants and provides initial R.C.A.F. training for incoming nursing sisters.

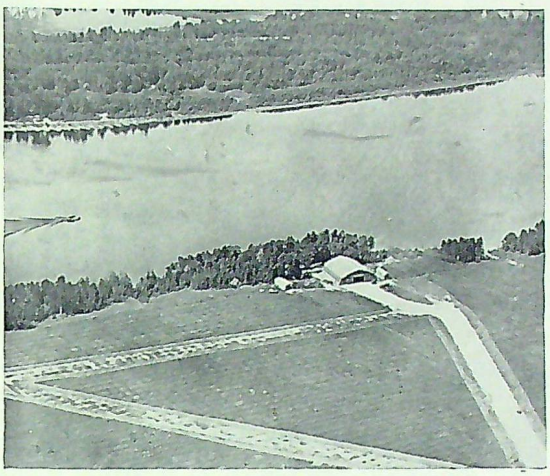
Air Cdre. A. D. Ross, G.C., C.B.E.

Air Transport Command

The senior ranking officer at Rockcliffe today is Air Commodore A. D. Ross, G.C., C.B.E., Air Officer Commanding Air Transport Command. Air Commodore Ross entered the Air Force in 1928 from Royal Military College. Now, at 42, he has one of the biggest jobs in the Service. Under his control are the R.C.A.F.'s three Transport Squadrons (No. 412 at Rockcliffe, No. 426 at Dorval, and No. 435 at Edmonton), No. 22 Photographic Wing, the Experimental and Proving Establishment, No. 901 Air Traffic Handling Unit, the R.C.A.F. Detachment at Arnprior (where flying is carried out for the National Research Council), and also the Central Accounting Records Office.

Air Cdre. Ross was formerly one of the Air Force's outstanding "bush pilots," logging many hours on photographic work and other operations over the North Country. During the war he commanded a base in No. 6 Group, and it was here that he exchanged his right arm for the blue ribbon of the George Cross. An aircraft, returning from bombing operations one night, crash-landed into another bomber which was parked, fully loaded, in a dispersal area. Aided by two airmen, Air Cdre. Ross managed to rescue the pilot and the rear gunner, but in so doing he lost his right arm below the elbow.

Each day the Air Commodore meets his staff officers in the Operations Room for a briefing which puts everyone completely into the picture as regards A.T.C.'s immediate activities. Overall weather conditions for the whole of North America are given, and the officers are briefed on the position of all A.T.C. aircraft at that time. Large coloured maps give at a glance the progress to date in the important photographic survey operations, and a big blackboard provides the location of every detachment of the three photographic squadrons, together with a summary of their individual progress. Another blackboard shows all A.T.C.'s special flights, whether actually under way or scheduled for the near future.

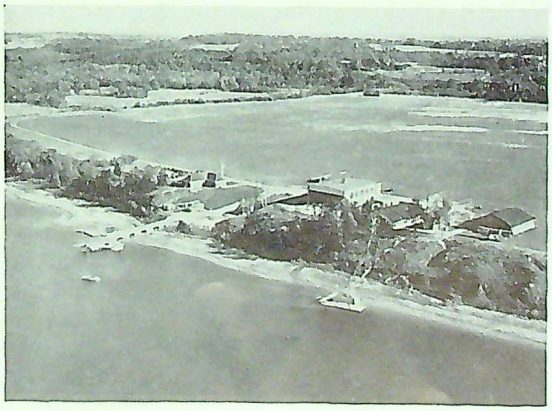


Ottawa Air Station, 1921

Working closely with Air Cdre. Ross are Group Capt. R. F. Gibb, A.F.C., his Chief Staff Officer, and Wing Cdr. W. H. Swetman, D.S.O., D.F.C., his Senior Air Staff Officer. Group Capt. Gibb, who is also a former Service "bush pilot," was one of the first N.C.O. pilots in the R.C.A.F. Wing Cdr. Swetman, considerably younger than either his A.O.C. or Group Capt., was a well-known bomber pilot during the war. He has the happy knack of imbuing others with his own cheerful efficiency.

No. 22 Photographic Wing

At the bottom of the bluff overlooking the aerodrome, and at the extreme east end of the Station, is a large white concrete building which is the centre for the greatest programme of aerial photographic survey operations being done anywhere in the world. Here are located the headquarters of No. 22 Photographic Wing. Under Wing Commander R. I. Thomas, A.F.C., the Wing directs the operations of the R.C.A.F.'s three photographic survey squadrons (Nos. 408, 413, and 414—all based at Rockcliffe), as well as exerting supervisory control over No. 1 Photographic Establishment and the School of Photography. In point of fact, the Photographic Establishment occupies by far the larger part of the building. The School of Photography has its own quarters elsewhere on the Station.



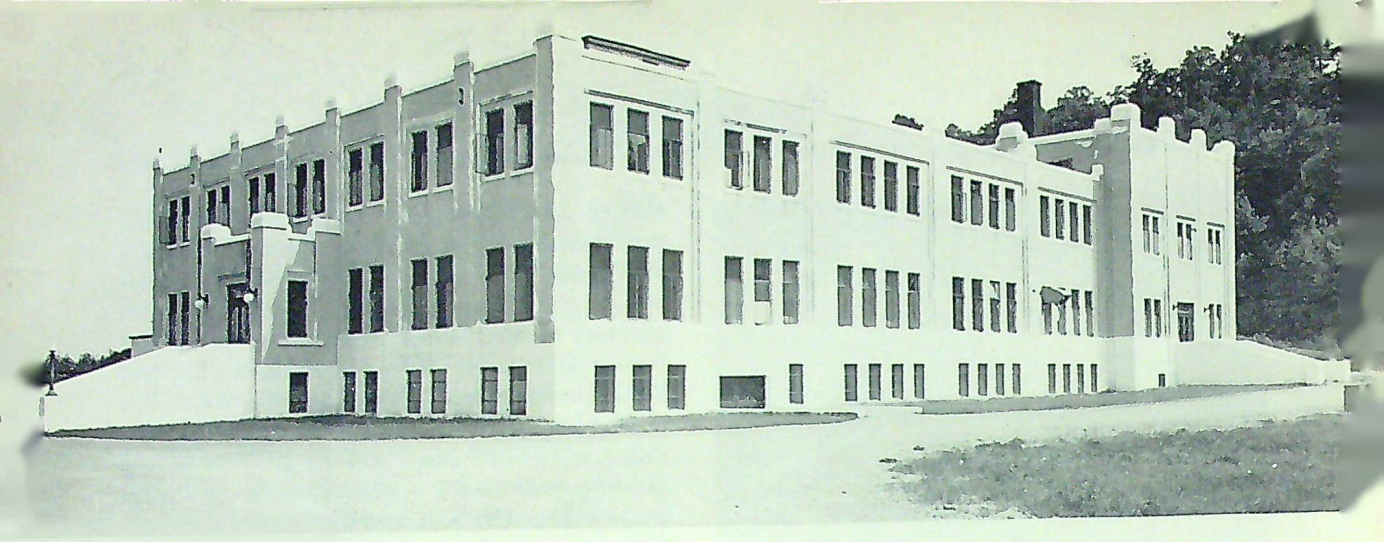
R.C.A.F. Station, Rockcliffe, in 1932

The Photographic Establishment itself is under the command of Wing Cdr. H. Pearce, O.B.E. He

The Station in 1948

enlisted as an airman nearly twenty-five years ago, and was one of the first photographers in the Service. Today he is one of the few Fellows of the Royal Photographic Society in Canada. Wing Cdr. Pearce's job actually begins where that of the photographic squadrons finishes, for the rolls of aerial negatives which are flown in from the field throughout the summer season are useless until they have gone through a complex procedure which makes them ready for the military and civilian mappers and the commercial users.

The officers and men who carry out the photographic survey operations, both air and ground,



No. 1 Photographic Establishment

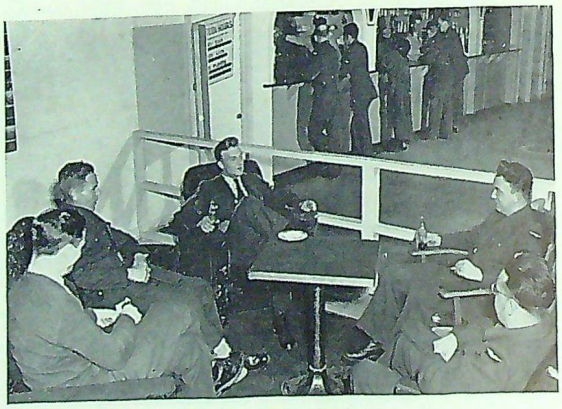
are playing a big part in the development of Canada. Visible evidence of their work exists wherever modern maps of Canada are used, as well as in the fireproof vaults of the Photographic Establishment, where millions of negatives are filed away. It is hard to exaggerate the importance from both a military and commercial point of view of this aspect of the Air Force's activities. As each succeeding photographic season comes and goes, Canada's defence planners, scientists, and commercial agencies are gaining more and more vital knowledge of their country and its resources.

Groundcrews begin in the spring to prepare the aircraft of the photographic squadrons for their arduous summer-long programme. Most of this work is done by Lancasters, Dakotas, Norsemans, and Cansos—the last-mentioned being used as supply planes. When the aircraft leave Rockcliffe everything *must* be in perfect order, for once they are in the Far North comparatively small troubles may assume serious proportions.

In some cases the 'planes leave Rockcliffe to work from established air bases, but often they must operate from temporary bases set up just for the summer months. Aircraft heading for such latter points take with them their own groundcrews, complete down to cooks, for they are entirely on their own, and it may be necessary to do a repair job on remote landing strips or on the desolate beaches of arctic islands with no more facilities then those carried by the aircraft itself.

Frequent mention has been made in past issues of "The Roundel" of the R.C.A.F.'s general photographic survey work. There is, therefore, no need for further description of it here. A few words may not be out of place, however, regarding the processing by the Photographic Establishment of the films that arrive in from the field.

The 450-foot rolls of exposed film are accompanied by full reports of the area covered, the weather conditions at time of exposure, the height and speed of the aircraft, and other details. The film is put through two continuous processing machines for development. Built especially for the task by the R.C.A.F. and the National Research Council, the machines turn out the films at a rate of five feet per minute. The negatives then go to the annotating tables, the tops of which are of glass with strong lights underneath. Here the film is given an initial check by skilled airmen for accuracy and quality, and each



The Airmen's Canteen

The Hon. Brooke Claxton (Centre) welcomes Mr. Louis A. Johnson, U.S. Secretary of Defence (right), and Mr. Lawrence Steinhardt, U.S. Ambassador to Canada

negative is marked with a number to allow instant identification at any later date. The negatives are then printed, and a complete set of prints covering a certain area is laid out in a rough mosaic, which in turn is photographed by a travelling camera overhead. In this manner it can be seen instantly whether the photographic 'planes have left gaps in their coverage. If they have, the detachment concerned is immediately notified in order that it may correct the omission. One copy of every picture goes to the Air Photographic Library in the Department of Mines and Resources and other copies are sent, as required, to the Armed Forces and other government agencies. The Photographic Establishment has one of the world's finest and most modern laboratories, and authorities from foreign countries pay frequent visits to study the methods of this world-famed organization.

The Photographic Establishment and the squadrons in the field work very closely together. Some idea of the efficiency of this combination may be given by reference to a special job which was carried out last year, when disastrous floods hit British Columbia. The R.C.A.F. was requested to make a rush photographic survey of the flooded Fraser River area. Aircraft already in the area were detailed by Photographic Wing Headquarters, and the pictures were taken on the same day on which the request was received. The exposed film was flown to Rockcliffe, where an emergency crew stood waiting to process it. The request was received on a Saturday, and by Monday morning the hundreds of prints, all neatly tabulated, were back in Vancouver and in the hands of the flood control authorities.

The men who take the Air Force's pictures, both on the ground and in the air, learn their trade at No. 1 School of Photography, commanded by Flt. Lt. J. A. Loftus, D.F.C. One of their first exercises is to take a photograph of an ordinary hen's egg, upon which spots have been marked in ink. This calls for adherence to certain basic rules of lighting and other photographic procedures, if the picture is to look like a real egg and to show up the spots in detail. From this humble beginning they may eventually progress to the photographing of new land masses in the Arctic, never before recorded by man.

This past summer No. 408 Squadron has been experimenting with Shoran-controlled photography, and it is possible that much time and money may eventually be saved by its use. Under present conditions, ground position points are necessary before aerial photographs of unsurveyed areas can be turned into accurate maps. One of the important tasks of the photographic squadrons is to fly Mines and Resources men to northern regions so that they may establish the ground position points by astronomical observations. Use of ground radar beacons, together with airborne radar equipment, may enable photographs to be positioned with accuracy independently of such ground points, and a network of radar beacon sights for geodetic control has been set up in Manitoba and Saskatchewan. It is too early to determine what effect this system will have on present aerial photographic work in Canada, but it is hoped that No. 408's experiences may go a long way towards providing an answer.

In addition to its photographic functions, No. 413 Squadron, with its big Cansos, is called upon to make a number of special northern flights. Notable among such operations in the last few years have been the series of flights made for Mines and Resources, to establish the position of the North Magnetic Pole. For the third successive year, 1949 saw a Canso leave Rockcliffe with a party of scientists aboard, headed for the Arctic

Islands. Some idea of the special skill required and the extraordinary hazards encountered in such operations may be gathered from the citations covering the award of the Air Force Cross to the pilot and navigator of the first flight in 1947. The photographic 'planes also come in for their share of Search and Rescue flights, should they happen to be in an area where a Search and Rescue operation becomes necessary. It was a Canso from No. 413 Squadron that picked up the crew and passengers of a U.S. Navy Beechcraft which crash-landed last autumn along the northern Manitoba-Saskatchewan border.

No. 412 Squadron

Not to be overlooked when mention of special flights is made, is No. 412 Transport Squadron. One flight may find them carrying a number of senior government officials to an important international conference overseas, while on the next flight they may be transporting a group of R.C.A.F. construction engineers to make a survey of stations in the Arctic. Brazil, Czechoslovakia, and Japan are among the spots that No. 412's aircraft have visited in the last few years, and flights to the United Kingdom and the United States are purely matters of routine. Both aircrew and groundcrew are expected to be ready at any time for special duties, and are often called upon to put in hours far in excess of those required on scheduled operations. But they love it. Even the wives get used to their husbands ringing them up and explaining that they are off for a week or so to Texas or the Arctic.

The straight transport operations of the R.C.A.F. have assumed noteworthy proportions, and an organization is needed to see that all freight reaches its proper destination. This is the duty of No. 901 Air Traffic Handling Unit, with its various detachments at Stations all across the country. If it is necessary to move Service freight from Halifax to Goose Bay by air, the freight is taken to No. 901 A.T.H.U. Detachment at Dartmouth. A.T.H.U. takes over from there and sees that it ends up in the right place. Officer Commanding the Unit is Sqn. Ldr. W. J. Lewis, D.F.C.

Checking data after a test flight. Left to right: Sqn. Ldr. H. F. Marcou, D.F.C., A.F.C.; Wing Cdr. J. R. Frizzle; Flt. Lt. V. B. Carson; Wing Cdr. D. A. MacLulich.

Experimental and Proving Establishment

The Experimental and Proving Establishment, headed by Wing Cdr. J. R. Frizzle, is another Rockcliffe unit that is doing invaluable work for both Service and civilian Canada. Every type of aircraft which the R.C.A.F. proposes to use must be thoroughly tested prior to its acceptance. Therefore, specialists from the Establishment go over it, bit by bit, to ensure that there are no flaws which may cause trouble later on. After they have done with it, experienced pilots take it up and give it a complete "going-over" in the air. This testing is, of course, carried out in addition to the normal testing given by the manufacturers. The net result is that, when the R.C.A.F. accepts an aircraft, everything humanly possible has been done to make certain that it conforms to specifications and that it is virtually free from "bugs." As a corollary to the foregoing duty, it also falls to the lot of E. & P.E. to write pilots' handling notes for all types of Service aircraft.

In addition to the above tasks, E. & P.E. is continually working on special assignments, many of them in conjunction with the National Research Council. One such assignment has, for some time past, been flying the famed Rockcliffe "Ice-

Married quarters

Wagon," a special high-tailed Liberator used for experimental work in connection with icing conditions. Flown by E. & P.E., and carrying a group of N.R.C.'s scientists, the "Ice-Wagon" has been a familiar sight at Rockcliffe for a number of years, taking off whenever particularly bad icing conditions were reported, and deliberately flying in weather that would cause most other pilots to check on their insurance. Filled with intricate gadgets designed to obtain data upon icing conditions, the "Ice-Wagon" has provided much valuable information and been instrumental in the development of improved de-icing apparatus. The original Liberator has at last gone into well-earned retirement, but a North Star is now being fitted out to carry on the good work, and is expected to be in service soon.

Conclusion

In the foregoing pages the writer has tried to give some idea of Rockcliffe's "on-duty" life. Its life off duty is no less varied and pleasant. Its recreational facilities leave little to be desired, and, as has already been said, more married quarters are being provided as fast as arrangements for their construction can be made. R.C.A.F. Station, Rockcliffe, is a happy station and a good one, and the residents of Ottawa point to it with considerable pride. The history books of fifty years hence, when they tell of the development of Canada, will surely have occasion to make frequent mention of its name; for Rockcliffe has been the home of many Canadians who have indeed served their country well.

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STALAG LUFT III

PART I

by Flt. Lt. John E. Mahoney

("The Roundel" is fortunate in having recently received permission from Flt. Lt. John E. Mahoney to reproduce, in serial form, his privately-published book, "Life in Stalag Luft III." We feel that it gives a singularly faithful and undramatized picture of one of those strange and isolated little worlds of which so many Allied Servicemen were forced to become citizens during the Second World War. Flt. Lt. Mahoney is at present stationed at R.C.A.F. Station, Chatham, N.B.—Editor)

Foreword

While I was in prison camp I was given a "War Log" by the Canadian Y.M.C.A. The gift inspired me to keep a record of all those events which I thought might later interest or amuse "the folks back home." On my return to Canada, however, many of my friends assured me that they found the notes of more than just casual interest, and I was eventually prevailed upon to rewrite them in book form.

I have attempted to make the book a factual and informal account of prison life in all its aspects. It is in no sense a saga of horrors and atrocities. Propaganda of any kind has no share in its purpose. It is merely a record of the lives the "kriegies" made for themselves—of their joys and sorrows, their thoughts and acts, the atmosphere and conditions in which they lived.

I have refrained from mentioning names, partly because some of my readers might resent it, but chiefly because I feel that any such mention could not help but entail the commission of injustices. Sorely tempted though I am to offer my tribute to those many officers of my acquaintance who worked incessantly for the camp's welfare, I hesitate to do so lest I should omit others no less deserving.

Nevertheless, there was one man among us with regard to whom I can break my self-imposed rule of reticence with complete confidence. I refer to our Senior British Officer, Group Captain (now Air Commodore) L. E. Wray. None of us will soon forget the wonders he worked, both with ourselves and with the Germans, during those last chaotic days of the war.

In concluding these few prefatory remarks, I wish to express my gratitude to my sister, Ruth, for her patient typing and re-typing of my manuscripts, and to Mr. E. B. Reid for his many helpful criticisms and suggestions.

— CHAPTER ONE —

Arrival

"Bombs gone!"

It was the eighteenth time I'd heard those words from my bomb-aimer, but this time they held a special significance for me. They meant that my fondest dream was at last realized. I had bombed Berlin. With a light heart, I set course away from the target.

Barely three minutes later, it happened.

Somewhere behind me, three sharp explosions sounded in quick succession. The aircraft shuddered, seemed almost to stagger, then its nose went slowly down.

"This," I thought, "is IT!"

Quietly over the intercomm. came the Wireless Operator's voice:

"There's a fire in the bomb bays, Skip."

I glanced over my shoulder and saw a dull red glow, dimmed by black smoke. At the same time, I tried to pull the nose up, but found that the elevator controls were gone. Ailerons and rudder likewise proved useless. Meanwhile, the dive was becoming steeper and steeper.

"Prepare to abandon aircraft!"

As I gave the order, I set the automatic pilot's gyroscope to "SPIN" to warm it up. There was still a chance that "George" might work. Having done that, I looked back again. The dull red glow had now grown into a blaze which the navigator was making ineffectual efforts to put out with a fire-extinguisher. That was enough for me.

"Jump—jump!"

But my order to bale out was uttered into unresponsive darkness. The "mike" failed to send back its familiar hollow echo. The intercomm. too was out of commission . . . Well, the need to jump must be obvious to everyone by now—or if it wasn't, it soon would be!

I switched "George" to "IN," without result. The failure gave me a definite sinking feeling, since I'd been hoping against hope that "George" would take hold and keep the aircraft straight and level long enough for us to get out—and by this time we seemed to be in a terrifically steep dive.

I stepped back, intending to pull the intercomm. plug as I went. But it stuck. Once more I looked aft. The engineer's compartment was an inferno. Just behind me, in the navigator's compartment, the dim shape of Johnny the navigator was moving about.

"Get out!" I shouted at him.

I got back into my seat and began to fumble for the plug connection, but I couldn't find it. Damn! I'd have to undo the helmet straps. It seemed to take hours. While I was struggling with them, I tried to read the altimeter and rate of descent indicators, but I couldn't—partly, I suppose, because of my inability to concentrate. All I could think of was that we were going down like a bomb . . .

At last the blasted thing was off. I hurried back to the navigator's compartment and reached for my parachute, noticing with relief that Johnny and Jimmy (the bomb-aimer) were no longer in their places. Fire and smoke prevented any further view of the plane's interior.

In the midst of my frantic endeavours to put on the 'chute, I suddenly became aware that it was getting momentarily heavier and that my legs wanted to buckle. My wonder turned to joy, however, when I realized what had happened. The aircraft had come out of its dive and was starting to climb!

A few seconds later, choking and sweating, I stepped through the escape hatch in the bomb-aimer's compartment out into the cool night air.

After the 'chute had opened and I was able to look around, I was surprised to find myself still about four or five thousand feet above the ground. I was well clear of the target, but not quite clear of the searchlight zone which extended for fifty miles around Germany's capital. As I hung there in space, I was oppressed by an overwhelming sense of aloneness. The only sounds were the occasional "pops" of bursting flak among the wavering searchlight beams and the steady drone of aircraft fading into the night . . .

Soon the ground became more visible, and I could see several houses beneath me. Dropping closer, I seemed to be descending at an alarming rate, and I wondered if my 'chute was functioning all right. Closer and closer . . . roofs beneath me . . . big vacant space . . . level with roofs . . . half roof-height . . . relax!

And then I was down. I tumbled over once or twice, and eventually got to my feet, apparently unbruised.

I undid the harness and Mae West and gathered up my 'chute. I had landed near the edge of a vacant lot, about ten feet away from a high spiked fence. A close call! The next step was to bury my parachute and Mae West, so that they wouldn't be found and attract attention later.

A voice was shouting in the distance . . .

The ground was too hard to dig, so I carried the 'chute about a hundred feet till I came to a street. Here I again started digging in a shallow drain. Nobody seemed to be around. Half-way through the burying, I heard footsteps coming along the road. I lay down. The footsteps came closer, and stopped. I lay still for about five minutes, then, hearing nothing further, continued digging. Suddenly a flashlight shone in my direction and a voice called out in German. The game was up. I raised my hands and approached the light.

A soldier was holding a revolver pointed at me. He said something I could not understand, but I

thought I had better reply quickly before his gun went off.

"English!" I gulped.

"Komm hier," he said. *That* I understood well enough.

He took me to a cellar beneath a nearby house, which a family was using as an air-raid shelter. There were three people there—a man and two women. All of them seemed somewhat apprehensive of the murderous "terrorflieger" who had invaded their sanctuary. My guard searched me cursorily, then told me to sit down and wait.

* * *

After about half an hour, more soldiers arrived and I was taken along to their headquarters. Much telephoning ensued. Apparently the officer in charge had never had an airman prisoner before, and being "army," he didn't know what to do with me. (In Germany, the Luftwaffe took care of air force prisoners, the Wehrmacht of army, and the Navy of naval.) When he had harangued and gesticulated for fifteen minutes or so, he appeared satisfied, and sent me into another room under guard while awaiting further orders.

My guard, a young corporal, was very polite and tried to converse in a friendly manner, but it was rather hopeless as neither of us could understand the other. However, he offered me cigarettes (my own had been taken away) and also some foul black coffee, which, I gathered, was the best in Germany.

While waiting, I had plenty of time to reflect on the events of the night. Nothing serious had ever happened to us before. Then suddenly—bingo! we'd had it. I couldn't be sure as to what had hit us, but I decided that it must have been flak, since my gunners had always reported any nearby fighters.

Many other thoughts occupied my mind . . . what had happened to the rest of the crew? . . . were they all safe somewhere? . . . how would my wife take the news that I was missing? . . . and our little six-months-old boy—how old would he be when I next saw him? Never before had I wondered so earnestly how long the war would last. (I was to learn later that this particular problem provided one of the main topics of conversation among prisoners of war.)

Around dawn I was driven to the Luftwaffe's headquarters in Berlin, about twenty miles away. As we approached the city we could see mountainous billows of gray smoke rising above the section of the city which had been hit. It was an awe-inspiring sight. The faces of the Germans in the car with me were tense with anxiety.

We passed through the outskirts of the city, then on through the famous *Unter den Linden,* with its camouflaged netting overhead.

On arrival at headquarters, I was taken to a small but clean room, already occupied by one other British officer. The room contained four wash-stands, two benches, and twenty-four mattresses on floorboards.

German guards provided hot coffee, half a loaf of bread, and a slab of margarine. The bread, universal in Germany, was brown doughy stuff that definitely took getting used to. They also brought along some sausage meat—but that, hungry as I was, I could not eat. I discovered later that our boys called it "blood sausage," which struck me as a scarcely vile enough name. The Germans themselves didn't seem to mind it. I suppose they had long since grown accustomed to it.

My efforts to sleep during the hours that followed were constantly interrupted by new arrivals. Each time one entered I looked up to see if any other members of my crew had been caught.

I had just about given up when in walked Louie, the rear gunner.

Hardly had we finished exchanging our first vociferous greetings and settled down to comparing our experiences, when Dickie, our mid-upper gunner, made his appearance.

"Hey, Dickie! Come over and join the party," I cried. "How'd they get you"?

His face lit up. "Hi, Skip!" "Hi, Louie." Dickie was a Canadian, a nice fellow, and very quiet.

"How long were you on the loose?" Louie asked.

"Three or four hours."

"Where'd you come down?"

"Near a farm. In an apple tree. My 'chute got stuck. I couldn't get out for a long time."

By this time the place was getting pretty crowded. Towards evening our number had grown to about thirty—a sorry-looking lot but happy in that we were at least alive.

The following afternoon Mac, my Wireless Operator, also turned up. He was dressed in civvies and he looked somewhat worried.

"After I came down," he told us, when the preliminaries were over, "I was free for six or seven hours. I always wear civvies under my battle-dress, so I just dumped the battle-dress, thinking I'd have a better chance to escape. The trouble is now, the Jerries won't believe I'm 'air force'. They say they're going to turn me over to the Gestapo as a spy."

We tried to comfort him.

"Don't let them worry you. That's just one of their gags to try and make you talk. They're just bluffing."

"I know," said Mac, "but you never know how far they'll carry their bluff."

From Mac we learned that the Flight Engineer did not get out of the plane. "The main fire seemed to be burning fiercely in his compartment, Skip. It flared up there immediately after the explosion. How about Johnny and Jimmy?"

I told him what I knew, and we were silent awhile, thinking our separate thoughts . . .

At dawn the next morning we were driven off to catch the train for Frankfurt, near which city was located the famous Dulag Luft*—the transit

*"Dulag" is a contraction for "Durchgangslager" (transit camp), while "Stalag" stands for "Stammlager" (base camp). "Luft," of course, means "air."

camp to which all aircrew prisoners were taken for interrogation before being sent to an ordinary Stalag. By now we were a bit tired of our dungeon, and anxious to be on our way.

At the Potsdam Station, while waiting for the train, we saw a column of slave workers being marched off to another train. They marched in single file, chained to each other, head and shoulders bent, obviously undernourished, and dressed in rags. Old men, young men, women and girls—the faces of all of them bore a hopeless and weary look. This was our first sight of the horrors of the German régime.

As mile upon mile clicked away beneath the wheels, and we saw ourselves coming closer and closer to the inevitable barbed wire, I am sure that the thought uppermost in the minds of all thirty of us was whether we could escape. But not for a second did our nine guards relax their vigilance, and in the evening we were duly delivered at Frankfurt, whence we were shepherded into a local train which took us on to the station within two miles of Dulag Luft. From here a public street-car carried us out to camp. En route, we derived some small satisfaction from this evidence of the plight of the Germans' transport situation.

* * *

Our first sight of Dulag Luft did not impress us. It appeared to consist merely of a long, low building surrounded by a mass of barbed wire, amply guarded, and with a searchlight at each end.

When we had been searched—one by one and with Teutonic thoroughness—a German officer approached another Squadron Leader and myself to advise us that we were being sent to a nearby hospital on account of the overcrowding at Dulag. Although we were surprised at his solicitude, and half-expected to be shot on the way by our machine-gun-armed guards, we eventually found ourselves locked and bolted in comfortable rooms (one for each of us) in the hospital. The beds were adequate and I slept well, awaking in the morning to be served with a breakfast that was not too bad.

In the afternoon I was visited by an interrogator posing as a Red Cross agent. We had been told about such people in our training days, so I knew all the answers.

"I am from the Red Cross," he said, "I have come to take your particulars."

"Make yourself at home," I told him.

He sat down opposite me and pulled out a package of cigarettes. I hadn't had a cigarette for a couple of days now, and his offer was more than welcome.

"Could I have your name please?"

"John Edward Mahoney."

"Rank?"

"Squadron Leader."

"Number?"

"40182."

"Married or single?"

"I can't say."

He looked surprised. "Surely you can answer a harmless question like that!"

"You know our orders," I said. "We are to give only our name, rank and number."

"But this is for the Red Cross files. There are just a few more questions you must answer, such as your wife's address—if you're married—your home address, your squadron number, the names of your crew so that we can check up on them, and so on. Purely routine."

He talked very persuasively, offering me another cigarette. When, however, he saw that I was quite determined to tell him nothing, he left me. The flow of free cigarettes was ended, but it had been a pleasant break in the monotony. (I heard subsequently of one quick-witted fellow who stretched out a similar interview as long as he could, asking for a cigarette every five minutes. Having taken four or five puffs on each one, he stubbed them out on the ash-tray. This naturally left him a fine collection of ¾-length cigarettes to be smoked at his leisure.)

During my three-day stay in the hospital, apart from making an abortive attempt to escape by fashioning a key out of a coat-hanger, I had little to do but watch the convalescents walking outside in the lovely grounds, with their spacious lawns and well-kept flower-gardens. Nor did I omit to

take note of the very delightful-looking servant girls who passed to and fro. They were obviously not German, for they were constantly laughing. They used to smile up at me as they passed my window, holding up two fingers in the "V" sign.

On the fourth day a guard came to take me to Dulag Luft proper, where I underwent my real interrogation.

I was conducted into a small office. In front of me a German officer sat behind a desk. He looked up as I entered.

"Sit down, please," he said in broken English.

Offering me a cigarette, he went on:

"There are just a few details we would like to know before you go to join your friends."

"I can tell you only my name, rank, and number," I replied.

"Have you an identity disk?" he asked.

"No," I answered, "I lost it."

"No identity disk?" He feigned amazement. "Then how can you prove your identity? For all we know, you may be a spy. Can you give me the names of any of your crew who could identify you?"

"No," I answered, "My uniform should be enough."

He made a few more unsuccessful attempts to intimidate me, asking questions such as where and when I was shot down, what my squadron number was, how many trips I had done, if I had dropped my bombs, and so on; but I gave him no satisfaction. Then suddenly he opened a drawer and pulled out a file about an inch thick, entitled "149 Squadron." I was staggered: it was the number of my old squadron!

"We know all about you," he said, grinning, "so you may as well talk. Our intelligence reports are very thorough."

He read off the names of my Commanding Officer, various section leaders, and other officers in the Squadron. I was astounded, but tried not to show it.

"I'm sorry," I said, "I cannot confirm any of your reports."

When he saw that all his powers of persuasion had failed, he called in the guard and ordered him to take me away to the prison camp.

I was surprised and delighted when I arrived there. Thanks to the Red Cross, we fed wonderfully, and I also learned that the Red Cross provided fifty cigarettes per week, six ounces of chocolate, soap, and various other odds and ends. I was issued with a kit-bag, a pair of socks, shaving soap and tooth paste, and was told that more would be provided at our permanent camp. The most precious possession which I received here was the "War Log" already referred to.

To crown my satisfaction, who should arrive in the compound the next day but Johnny and Jimmy.

Before we left, some twenty-four hours later, we wished each other the best of luck, for we little knew when we might meet again. Since they were sergeants and I was an officer, we were going to different camps.

As we were lined up ready to leave, the German Commandant gave us a brief address.

"You are British officers and gentlemen. Remember that. Conduct yourselves in the march to the station with dignity and quiet, so that you will not stir up the wrath of the civilian population who will see you. You are warned not to try to escape. If you do so, you will be shot without further warning."

Marching through the streets, we were struck by the sallow complexion and the sullen looks on the faces of the Germans. Never once did I see a German smile at this stage of the war. They looked "fed-up" even in '43.

We arrived at the station to find that the ninety-six of us were to make the two-and-a-half-day journey in cattle cars. The German officer in charge said he was very sorry we had to travel like that, but that it was impossible to provide ordinary coaches, as they were all being used to evacuate women and children from heavily-bombed cities. This made us feel a bit better, but it did not detract much from the subsequent discomfort of the trip.

We arrived at Stalag Luft III, Sagan, at noon on September 2nd, 1943.

(To be continued)

ROYAL CANADIAN AIR FORCE Association

WITH THE HOLIDAY SEASON ENDED and all the fish stories told, there are signs of increased activity by our Wings all across Canada. Don't forget to keep us posted on everything that's going on.

No. 800 (Forbidden Plateau) Wing

The following letter received from Mr. Howard Fullard, of Courtenay, B.C., will be of particular interest to those who are doubtful as to whether a Wing can be a success in a small community.

"Our Wing, No. 800 (Forbidden Plateau) Wing, was the first one in B.C. to obtain its charter and, as you can imagine, we are very proud of the fact—having, of course, beaten other centres such as Vancouver and Victoria. We had our charter presentation on Air Force Day at 'The Alders,' a tourist camp several miles from Courtenay. This resort, incidentally, is owned by two ex-RCAF types, Les Hobbs and Dick Farrington. The presentation was in the form of a social gathering and banquet, and approximately forty members and their wives attended. We were fortunate to have Ralph Gibson, 2nd Vice-President of the B.C. Provincial Command of the Canadian Legion, to make the presentation. Ralph gave a very fine speech and got us off to a good start. Needless to say, 'a good time was had by all'—and not even one member fell into the 'salt chuck.'

"We have between 25 and 30 members to date, and we have had regular monthly meetings up to June, when it was decided to call them off until September on account of holidays, etc. Bob Canning of the Courtenay Hotel has been a pillar of strength and has placed his hotel at our disposal.

"As one of the aims and objects of the Wing is to help one another, we had a beach-cleaning bee at 'The Alders' recently and made huge fires to burn up driftwood. Our wives were in on it, too, and we made a regular picnic out of the occasion. I understand there was an even better picnic the day following, when the fire got out of hand and the district fire warden came down to see what it was all about.

"While we naturally have a tremendous amount of work still to do, we have made a good start. A number of our members are instructors in the local Air Cadet Sqdn. (No. 386), and our Wing has pledged itself to help wherever possible. We have also volunteered to form a committee to assist the RCAF Benevolent Fund and administer it in this locality. At the time of writing there is every indication that our offer will be accepted.

"Trusting these few thoughts will assist you to round out a little story for Ye Olde Editor. Cheerio for now."

Air Gunners Association

Mr. F. Sutton, General Secretary of the Air Gunners Association which has been formed in England under the Presidency of Air Marshal Sir B. E. Embry, K.C.B., C.B., D.S.O., D.F.C., A.F.C., writes us:

"I take great pleasure in drawing your attention to the existence of the Air Gunners Association. I enclose a copy of the 'Turret,' which I feel sure will tell you all you may wish to know about us.

"I feel that many of your members who were Air Gunners might like also to join our ranks, and therefore would be more than grateful if you could perhaps make mention of us in the journal which I presume your Association circulates in Canada. I shall be pleased to send full details to anyone who cares to write me.

"I would add that I spent eighteen months (June 1942 to Dec. 1943) on the Instructional Staff at 31 P.E., Moncton, so I would naturally be particularly delighted to welcome members from Canada.

"With all good wishes to the R.C.A.F.A.,

yours sincerely,

F. Sutton,

General Secretary

The R.C.A.F.A. wishes the Air Gunners Association every success.

No. 302 (City of Quebec) Wing

The ancient city of Quebec now has a Wing of the Association. This Wing will be known as No. 302 (City of Quebec) Wing and the members of the provisional executive are as follows:

President:	Paul A. Faguy, 91 Sir Adolphe Routher, Quebec
1st Vice-President:	Claude Gourdeau, 10 Desroches, Quebec
Secretary:	Pierre Cote, 158 Holland, Quebec.
Treasurer:	Gilles Lamontagne, 75 Laurentide Ave., Quebec

The best of luck to our new Wing!

Some of the Members of No. 100 (Bluenose) Wing. Front row, left to right: Misses Glannie Boyle, Patricia Smith, Ruth Vogler (president), Mildred Rogers, Vivian Graves. Second row: Misses Rhoda Wilkie, Ethel Miller, Dorothy Smith, Eleanor Cameron, Vinie Messervey, Mary Northup. Third row: Miss Betty Campbell, Miss Caroline Martell, Mrs. J. H. Towers, Miss Marion Williams, Mrs. Ltae MacLellan, Mrs. Margaret Barke, Miss Mary McKenzie, Miss Holly Spicer. Forth Row: Miss Betty Anderson, Mrs. Mary Butler, Mrs. Irene Brandley, Mrs. Eileen O'Neil, Miss K. Carson, Miss Jean MacIntosh, Miss Mary Jefferson.

No. 100 (Bluenose) Wing

I guess most of you would like to see a change of pictures. After all, few of the men of the Association can be classed as glamorous, so we have prevailed on our W. D. Wing in Halifax to send us a photograph. Don't you think it was worth it?

WHAT'S THE SCORE

Since all the following questions (with variations) have appeared in promotion examinations during 1948 and 1949, a score of 20 should (of course) be regarded as average. Answers are given on page 48.

★ ★ ★

1. The component parts of the R.C.A.F. are:

   (*a*) Regular, Auxiliary
   (*b*) Regular, Auxiliary, Reserve
   (*c*) Regular, Reserve, Air Cadets
   (*d*) Regular, Reserve

2. President of the C.B.C. is:

   (*a*) Joseph Andrews
   (*b*) Joseph Smallwood
   (*c*) Joseph Louis
   (*d*) None of the above

3. Palmiro Togliatti is:

   (*a*) The Communist leader in Italy
   (*b*) The monarchist leader in Corsica
   (*c*) The Fascist leader in Sicily
   (*d*) President of the 'Good Humor' ice-cream company

4. The C.A.S. is directly responsible to:

   (*a*) The Cabinet
   (*b*) The Defence Committee
   (*c*) The Minister of National Defence
   (*d*) The Minister of National Defence for Air

5. With the Speaker in the Chair, ordinary Members of Parliament are allowed to speak for:

   (*a*) 3 hours
   (*b*) 40 minutes
   (*c*) 1½ hours
   (*d*) As long as their voices hold out

6. The Canadian Army in the Second World War took part in:

   (*a*) The "Battle of the Bulge"
   (*b*) The North African campaign
   (*c*) The freeing of the northern coast of France
   (*d*) The initial crossing of the Rhine

7. Each of the following group consists of one Air Force, Army, and Navy rank—in that order. In which one group do all three ranks correspond?

   (*a*) Air Commodore, Colonel, Commodore
   (*b*) Flight Lieutenant, Lieutenant, Lieutenant
   (*c*) Flight Sergeant, Staff Sergeant, Chief Petty Officer
   (*d*) Air Marshal, Lieutenant-General, Rear-Admiral

8. Less than two years ago the Roumanian government was much concerned by the high incidence of pellagra among the people. Pellagra is:

   (*a*) A disease brought on by excessive consumption of edible fungi
   (*b*) A type of insanity akin to lycanthropy
   (*c*) A wasting disease caused by vitamin deficiency
   (*d*) A softening of the finger nails common among tanners

9. For promotion to the rank of sergeant, the length of satisfactory service required in the rank of corporal is normally:

   (*a*) 1 year
   (*b*) 2 years
   (*c*) 3 years
   (*d*) 4 years

10. In September 1948 the Communists proclaimed a Soviet régime for the Indonesian Republic. Indonesia is situated:

(a) Between French Indo-China and the Philippines
(b) North of New Guinea
(c) Between Rangoon and Ceylon
(d) South of Borneo

11. One of the following terms is NOT used in describing R.C.A.F. ranks:

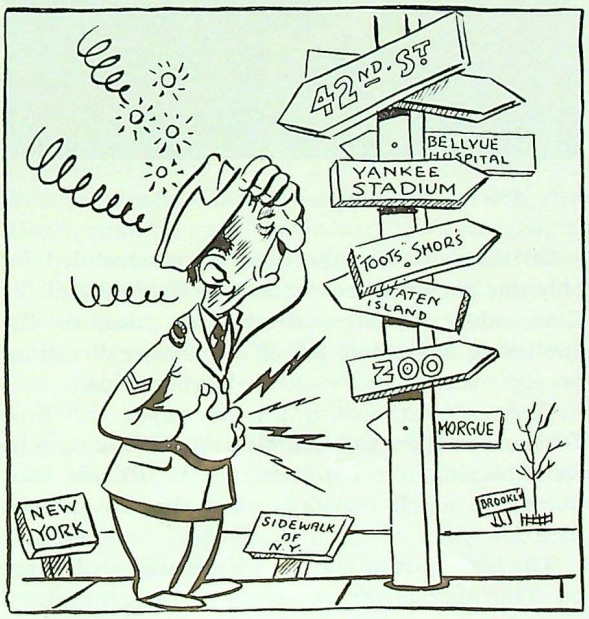
(a) Temporary
(b) Acting
(c) Honorary
(d) Permanent

12. Britain's gigantic agricultural project in Africa is directed primarily towards growing:

(a) Betel nuts
(b) Walnuts
(c) Pea-nuts
(d) Butter-nuts

13. An airman on leave in New York wishes to report sick. He is in possession of his "I" card and leave form. Where should he report?

(a) Canadian Legation
(b) Air Member, Canadian Joint Staff
(c) Nearest civilian practitioner
(d) Nearest military hospital



14. Bogota is:

(a) The capital of Venezuela
(b) A type of curd sausage highly esteemed by Tibetans
(c) The capital of Colombia
(d) The Japanese equivalent of garrotting

15. The discharge of a W.O.I. may be authorized by:

(a) An A.O.C.
(b) The C.A.S.
(c) The Minister
(d) The J.A.G.

16. Permafrost is:

(a) A new composite for surfacing runways in the North
(b) A stratum of ground that never thaws
(c) Trade-name of an American brand of ice-cream
(d) A shaving cream

17. NOT to be entered on a conduct sheet is:

(a) Reduction in rank of an N.C.O. for inefficiency
(b) Reduction in rank of an N.C.O. for misconduct
(c) An act of gallantry
(d) Deduction from ordinary pay

18. A vacant seat in the Canadian Senate must be filled within:

(a) 3 months
(b) 6 months
(c) 1 year
(d) Any period at all

19. A fight develops between two sergeants at a Sergeants' Mess party. Who is responsible for restoring order?

(a) The Orderly Sergeant
(b) President of the Mess Committee
(c) Any N.C.O. or W.O. above the rank of sergeant
(d) The senior W.O. present

20. Most of the war-time emergency powers of the Dominion Parliament were delegated by the War Measures Act to:

(a) The Senate
(b) The Cabinet
(c) The Governor General in Council
(d) The Ministry of Munitions and Supply

* * *

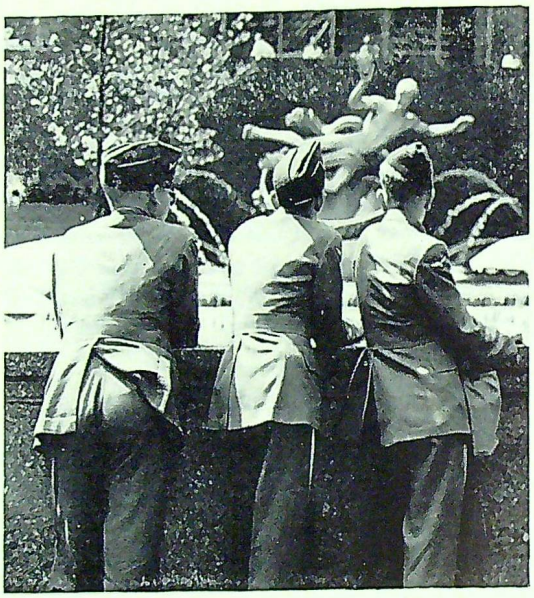
The ROYAL CANADIAN AIR CADETS

No. 180 (Mosquito) Squadron

THE PHOTOGRAPHS on this and the ensuing pages tell part of the story of No. 180 (Mosquito) Squadron's triumph in New York during the past summer, when the Squadron's band took top honours from a group of nineteen military bands. The Cadets, sponsored by the Toronto York Lions, were the only military bandsmen from Canada.

They arrived in the big city by train on the morning of July 18th, and after a brief period for settling themselves in their hotel, they were marching smartly down Fifth Avenue in a 6-mile parade which included crack contingents of the U.S., Cuba, Peru, Ecuador, and Salvador. As they marched, they were judged by New York City Council officials and executives of the International Lions.

Left to right: Air Cadets D. Saunders, N. Arnold, and E. Thackeray on Broadway



The three Musketeers visit Radio City . . .

On the next day the boys were scheduled for only one performance—at 3.30 in the lobby of the Commodore Hotel. After that, despite the sweltering heat, they set off in various directions on sight-seeing and souvenir-buying trips.

Wednesday the 20th was spent at the Polo Grounds as guests of the New York Giants, who were playing the Cincinnati Reds. There was, naturally, much rejoicing when the Giants won by 5-1.

The high spot of the New York stay took place on Thursday afternoon, however, when Colonel

. . . discuss life with screen actor Alan Mowbray

Kent C. Lambert, Post Commander at Governor's Island, invited the band to take part in a retreat parade at Fort Jay. Transport in the form of a 34-passenger bus, a 7-passenger limousine (familiarly called a 'hot dog' by the G.I.'s), and two covered jeeps moved off from the Chesterfield Hotel. At the Fort, Major General W. G. Wyman, Chief of Staff of the 1st U.S. Army, presented medals to seven members of the garrison. Later in the afternoon the boys were entertained by the Post Band at the N.C.O.'s club. Warrant Officers Soderberg and Fisher, bandmasters of the Post Band, complimented the lads on their fine playing and their snappy marching and countermarching. Mr. Harry Saunders, Bandmaster of the Air Cadet Band, officially expressed the appreciation of the boys and the R.C.A.F. for Col. Lambert's invitation.

After supper the Army vehicles returned the boys to their hotel, and after much scrambling and shouting the convoy again pushed off—this time for the railway station. There, with their instruments, baggage and spare uniforms, they tumbled into their special car with not a moment to spare.

As soon as all noses had been accounted for, Drum Major L. Hemsley and Corporal J. Dinely sank into a state of happy exhaustion amid the hullaballoo of the send-off, which included electric handshakes, itching powder, and explosive matches. Presently the train rolled away and bit by bit the noise quietened, until at last the car was still except for the occasional squirming of a very tired Air Cadet.

No. 200 (Sudbury) Squadron

We have just received from F/O Gordon T. Hubbard the first issue of the Squadron's magazine. It is a very creditable effort, and has evidently entailed a considerable amount of work (as who should realize better than we ourselves!).

Editor F/O Hubbard has started off his magazine with what might be termed a manifesto of the Cadet viewpoint and a concise summary of what is expected of every Squadron member in the way of discipline, loyalty, and serious application to his work as a Cadet.

. . . and restore their tissues with a spot of tea.

We wish the magazine every success—which, we would add, will be largely dependent upon its receiving the support it so well deserves.

The Band on parade: Fifth Avenue

While on the subject of Air Cadet periodicals, we would very much like to know what other Squadrons are producing their own magazines and to receive a copy of every issue. The production of a magazine need not be a costly process, and the work put into it is more than worth while.

THE BEAU TROPHY DRILL COMPETITION, 1949

By Group Capt. E. C. Luke, O.B.E.

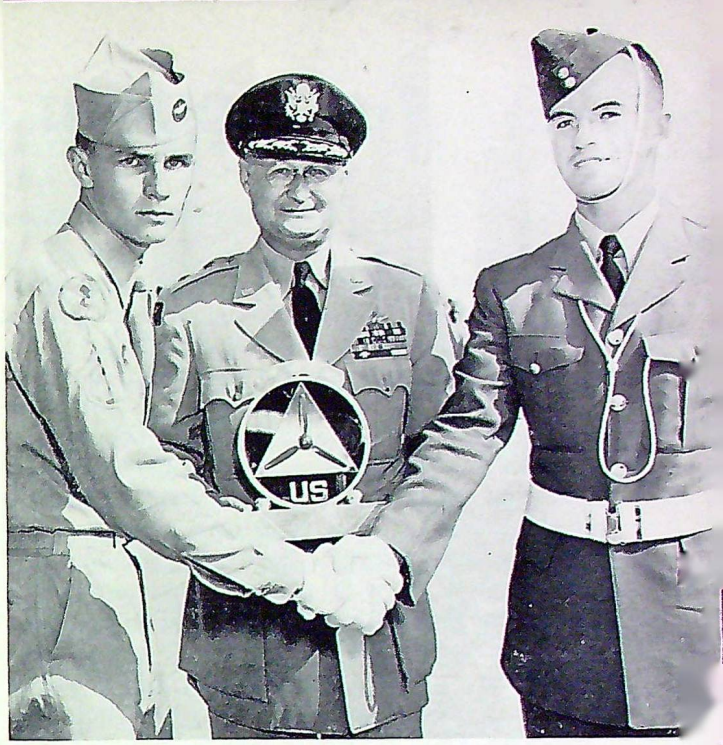
On Agust 30th I had the unusual and pleasant duty of being one of four judges at the Canadian National Exhibition in Toronto when the 1949 winners of the Major-General Lucas V. Beau International Challenge Trophy were chosen. To readers of "The Roundel" who do not know what the winning of the Beau Trophy implies, my statement may mean little. To the Service men of the

United States and Canada who were present, and to some ten or twelve thousand spectators in the fine new "Ex" grandstand, it was a thrilling and inspiring occasion.

Here were two squads of young cadets—one representing the Civil Air Patrol of the U.S.A., and the other the Royal Canadian Air Cadets of Canada—demonstrating their respective ideas of how precision drill should be done. And how they did it! They displayed their training and their team spirit so magnificently that everyone with whom I spoke afterwards agreed without hesitation that their only regret was the necessity of declaring any winners.

The huge outdoor stage of the Exhibition, with the blue August sky overhead, formed a perfect setting for the spectacle. As they went through the prescribed routines, every move was punctuated by a roar of applause from the enthusiastic audience. Then followed the hush while Major-General Beau and Air Vice-Marshal Middleton mounted the stage to be informed that the Canadian team had retained the trophy by a very close margin. As might be expected, this touched off a deafening ovation from the crowd, who stood up and cheered.

Major-General Beau then handed his trophy, with his congratulations, to the cadet captain of the Canadian squad. After that, the parade moved off in column of route, with their colours flying, to pass the grandstand in review. The Air Cadet band of Windsor Assumption College took the lead, followed by the two competing squads. Behind and supporting them, were the bands of the U.S. Marine Corps and the Royal Marines from the United Kingdom.



This handshake symbolizes friendly rivalry between U.S. and Canadian teams—Air Cadet W.O.II William Stewart, captain of winning Canadian team, is congratulated by Sgt. Arthur Barton who commanded U.S. Civil Air Patrol squadron, while Major General Lucas V. Beau looks on.

It was at this point that one careful observer drew my attention to what might be considered the most happy and significant phase of the competition. When the parade was dismissed and the ranks had dispersed, groups of young American and Canadian cadets moved off together, arm in arm, to enjoy the sights of the "Ex" and the thrills of the midway.

Anyone who requires reassurance concerning the spirit of friendly competition, youthful discipline, and potential leadership that is developing among the cadets of our two nations need look no further than next year's drill competition for the Beau Trophy.

(Further photographs of the winning of the Beau Trophy will appear in our November issue.)

SUPERSONIC WIND TUNNEL

THE LARGEST SUPERSONIC wind tunnel in the U.S. was recently revealed by the NACA at its Cleveland laboratories. The big tunnel is capable of producing winds of about 1,500 mph. It has an axial-flow air compressor with more than 1,000 blades and is powered with the most powerful single-shaft electric motor known to date. The tunnel has a 6 x 8 foot test section. Its motors operate at 900 rpm and are the largest ever built to run at that speed. ("*Air Force*")

A THOUGHT ON DISCIPLINE

by Sgt. D. J. Blain
R.C.A.F. Recruiting Unit, Brandon

Nineteen hundred and fifty-eight years before Shatterproof, an enterprising Roman general fought two successful major engagements. In the first of them his army of 80,000 faced an enemy numbering more than a quarter of a million, while in the second it defeated a force of upwards of 120,000. Several factors contributed to these amazing successes of the Roman arms—the matchless generalship of Julius Caesar, superior weapons and equipment, and better training—but the greatest factor of all was a secret weapon of which the German and Helvetian tribesmen knew little or nothing. That weapon was military discipline.

The consequences of the victories were far-reaching. Gaul became a Roman province and, with its acquisition, the mighty Roman Empire neared the zenith of its power. Through all the world's long history no other power has left such an indelible imprint on the life of mankind as the Empire which was created and maintained by the Roman Legions, and which only fell when the Legions themselves disintegrated into a mob of undisciplined adventurers selling their swords to the highest bidders.

The annals of military history furnish no finer examples of the results of discipline than the achievements of the Roman Legions. The efficiency of the Legion in battle was dependent upon the efficiency of its chain of command. Caesar, secure in the knowledge that this chain was forged from the metal of Roman discipline, could predict with accuracy the behavior of his troops in any given situation. With this knowledge he was always master of the day: without it, for all his genius, he could not have survived. Such knowledge is possible only for the commander of disciplined men.

The example of the Roman Legion is adduced merely as a reflection upon what discipline can accomplish. It is not for a moment suggested that we of to-day adopt the kind of discipline Caesar knew. For it was a harsh and rigid thing. Its purpose was the complete submergence of individuality and the reduction of the men in the ranks to a common type whose efforts could be calculated with absolute certainty. In the words of T. E. Lawrence, this discipline was "the lowest common denominator of men . . . the deeper the discipline, the lower was the individual excellence; also the more sure the performance."

Although, however, with the development of the art of war from its old formalized posturings to a new fluidity and speed of movement, the nature of discipline has changed, its purpose still remains the same. We no longer need a cast-iron mould for the production of soldiers as lacking in original thought as in individual personality. Rigidity must give place to a steel-like flexibility that is, none the less, sufficiently yielding to permit the display of individual initiative without impairing that all-important quality of predictability on which Caesar's victories were largely based.

In other words, to achieve its end in the world to-day, discipline must no longer be the lowest common denominator of men. Rather should we look upon it as the highest common factor.

BACK COPIES OF "THE ROUNDEL"

A limited quantity of numbers 1 to 5 (Nov. 1948 to March 1949, inclusive) of "The Roundel" are now available for distribution to Units and individuals already on our mailing lists.

To obtain same, it is merely necessary to drop a postcard to "The Roundel," Room 3130, D.N.D. Bldg. "B", Ottawa, Ont. Back copies will be sent out strictly in accordance with the rule of "first come first served."

The Crystallization Myth

By Wing Commander W. B. F. Mackay, B.Sc. (E.E.), B.Met.E., M.S.

(*Wing Cdr. Mackay, formerly of the R.C.A.F., is at present with the Institute of Technology at the University of Minnesota.*)

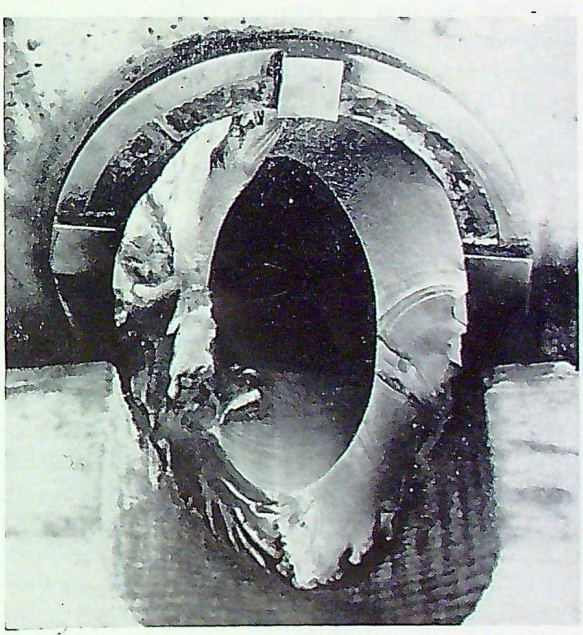
How many times have you seen mechanics or other people (even quite a number of engineers) turn broken metal parts over in their hands, scratch the roughened portions of the fractures with their fingernails, and, after prolonged "hmms," come out with: "Must have been faulty material. It crystallized."? With some such statement, the parts are usually thrown into the scrap bin, and the individual proceeds about his work with the smug feeling that he has analyzed the cause of the failure correctly and that these things are unavoidable and must be accepted as such.

The "Crystallization Theory" of the failure of metals is a myth. The type of failure which has been called "fatigue" or "failure due to repeated stress" is caused, not by crystallization, but by progressive cracking or fissuring.

Let us examine for a moment this crystallization business. In the first place, all metals, when solid, are crystalline. Therefore, how can we say that it crystallizes, when it is already crystalline? That is analagous to saying that water becomes wet. In the second place, this type of failure always takes place below the metals' recrystallizing or full annealing temperature—a fact which prevents it from recrystallizing or coarsening its grain size, as some people suppose it does. The perpetuation of a harmless myth is of no great concern, but when this myth tends to cloud over the true nature of things and prevents a proper understanding of some of the factors which can help to rectify the trouble, then it becomes harmful.

Whether or not it is generally realized, anyone associated with aircraft is vitally concerned with fatigue failures. Fatigue accounts for some 80-90% of metal failures in those highly stressed parts which are subjected to reversals of stress—such parts as propellers, gears, shafting, crankshafts, camshafts, wing spars, etc. Fatigue is not a particular affliction of metals alone; wood, for example, such as in a Mosquito wing spar, may be affected. Weight-saving is all important in aircraft construction, and as a result the safety factor, or 'factor of ignorance,' is cut down as low as possible with a corresponding increase in stress. Thus, an aircraft must be engineered much more carefully than most other structures in order to avoid failures. Despite the care that is given to these details, aircraft are still subject to fatigue failure. Another factor must be borne in mind, too—the additional hazard involved in the failure of a highly stressed aircraft component as compared to an equivalent component in, say, a stationary pumping engine or even an automobile.

Without getting ourselves deeply involved in the physics of metals, we can follow the mechanism of a fatigue failure quite readily by looking at the



Fatigue failure of an aircraft engine crankshaft. Failure in this case actually started at three separate locations. Progress of the fatigue crack on the right hand side can be followed from the base of the splines, out into the oyster shell markings and then on to eventual brittle fracture.

accompanying photograph of a broken crankshaft. To start fatigue, we must have a stress-raiser, usually on or near the surface of the part. This might be a scratch, rough machine mark, inclusion, poor fillet, etc. In the immediate vicinity of the stress-raiser, the stress may go up many times higher than that calculated for. If this happens, a small portion of the metal will eventually rupture, though the total average stress across the part may be well within the safe range. The small localized part that ruptures will start a minute crack. This crack will grow with further stress cycles, slowly at first and eventually rather rapidly as the wedge action intensifies the stress at the point of the crack. The early stages of cracking can usually be followed quite easily on a fracture by noting the conchoidal, or "oyster-shell," markings where the two sides of the crack have rubbed together. Eventually, when the remaining area can no longer support the load, a brittle fracture results. Even in ductile materials, this last portion to fracture looks rather rough and (since it has not been polished by any rubbing action) exposes the crystalline structure of the metal. It is this same last portion that is condemned first by the myth adherents.

The idea that the fatigued material is faulty may have some justification, but it is usually greatly overworked, as only about 10% of all failures are due to metallurgical defects. The remaining 90% are due to faulty design, improper fabrication, and poor maintenance and operation. It is with these latter categories, particularly maintenance and operation, that Air Force personnel are more directly concerned. Continual vigilance and care are necessary if such failures are to be avoided. Accurate reporting of design, fabrication, and metallurgical factors in defect and failure reports will help in clearing up certain cases.

The man in the field, however, has his responsibilities also. A good tradesman using correct procedures can eliminate a high percentage of potential failures. Much of the damage is done by rough handling, scratching and marring parts, poor machining and grinding, corrosion, excessive clamping stresses, loose fits or misalignment which contribute to excessive vibration, etc. The operation of an aircraft engine in a 'rough' speed range will greatly accelerate a possible fatigue failure. Unfortunately, all aircraft parts are not considered glamour parts, like propellers. Many mechanics will spend an hour smoothing out stone bruises on a propeller, yet drop a bunch of connecting rods into a drip tray, or thoughtlessly scratch the grease out of the splines of a crankshaft—with the result that actually happened in the photograph. The full co-operation of everyone concerned is needed to combat fatigue failures. Apart from the cost and serviceability aspect, it may avoid a serious accident.

BOMBER ECONOMICS

NOBODY, OF COURSE, has ever solved the problem of the economics of bomber building. During the War we saw the conflicting American and British theories being tried out in the field. It is interesting to see how far the Americans have gone in adopting the giant long-range bomber as exemplified in the B-36. On the other hand, even the Americans have not been able to build large numbers of these vast aircraft and it may be they would do better to adopt something smaller and faster. Our own night bombers achieved remarkable results, but it is instructive to recall the achievements of the twin-engined Mosquito which was eventually developed to the stage of carrying block-buster bombs.

There are those who still hold the view that the small, fast bomber is the best bet. It requires less effort to build and less effort to provide the trained crew. Because of its small size it has a better chance of getting through. If you only make it fast enough, it has no need of defensive armament. Of course, there is the rub, because the Germans made a venture of this kind with their early Heinkels and Dorniers but did not go for enough speed. It is interesting to note that the first post-war British jet bomber appears to follow the lead set with the design of the Mosquito.

("*Aeroplane*")

The N.R.C.'s Low Temperature Laboratory

by JOHN L. ORR, M.B.E.

(Condensed from an article in the N.R.C. "Quarterly Bulletin")

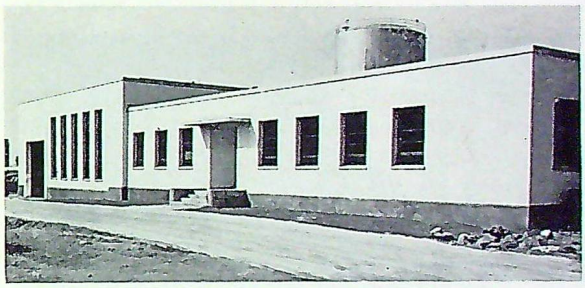
IT HAS BEEN SAID that Canada's future lies in her North. Certainly, a very large part of the Dominion lies within the arctic and sub-arctic regions. As Canada's northern frontiers continue to be pushed back at an ever-increasing pace, the problems associated with equipment and personnel at extreme low temperatures become more acute and often impede further progress. The future development of Canada depends upon finding solutions to these problems.

In order to meet this need, the National Research Council has provided extensive cold testing facilities in the Low Temperature Laboratory of the Mechanical Engineering Division. These facilities will be used to study the behaviour of men, materials and equipment, at low temperatures and under controlled conditions. In this way it is hoped to discover means for overcoming the problems of arctic operations (both civil and military), the problem of high altitude flight, the problems of protecting aircraft against icing, and so on.

In the past only limited laboratory facilities for small-scale tests have been available in Canada. In recent years, advanced bases for field testing have been established as far north as transportation conditions permitted. Development work at these advanced bases is seriously hampered by seasonal weather changes and by the extremely long and difficult supply routes.

In the Low Temperature Laboratory it is possible to produce any desired combination of temperature, wind, and *chill factor* throughout the year and to hold these conditions constant for any required length of time. Test conditions in the cold chambers may be accurately controlled and the experimental set-ups may be made more simply and in such a way that they lend themselves to rapid modification or repair.

Tests in the cold chambers will be much less expensive than field tests, by reason of the proximity to sources of supply, access to the excellent facilities of the whole of the National Research Laboratories, and the ability to control test conditions at will. In fact, it has been estimated that approximately three-quarters of all tests which now have to be carried out in the field could be performed equally well or better in the cold chambers, thereby accelerating the progress of development. While the final proving of equipment will always have to be carried out in the field under actual conditions, the cold chambers may be used to eliminate most of the "bugs" in advance. Thus the field establishments will be free to concentrate on their most important function of proof-testing.



Low Temperature Laboratory Building

Another climatic problem of particular interest to aviation in Canada is the formation of ice on aircraft, which ranks second only to ground fog as an obstacle to air navigation. The development and testing of protective equipment in the past has had to be done in flight under natural icing conditions—a procedure which presented many obstacles. To overcome these and to expedite the development of satisfactory anti-icing protection, an Icing Wind Tunnel has been provided in the Low Temperature Laboratory, using the same refrigeration plant that supplies the cold chambers. In the tunnel, refined tests on experimental equipment under controlled conditions can be made at any season prior to the final proving in flight.

Refrigeration Plant and Cold Chambers

The refrigeration plant, which is one of the largest of its kind in the country, employs six large reciprocating compressors for three-stage operation. The refrigeration capacity of the system is 250 tons, and the total driving power is 1,000 h.p.

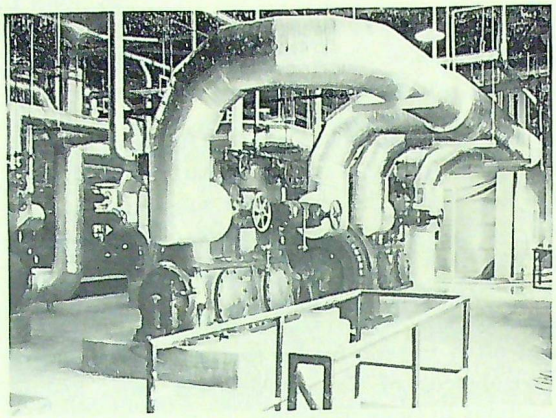
In all, three cold chambers are available, each of them capable of attaining a minimum temperature of −80°F.:

No. 1: 51 ft. long, 15 ft. wide, 15 ft. high
No. 2: 10 ft. long, 10 ft. wide, 8 ft. high
No. 3: 10 ft. long, 10 ft. wide, 8 ft. high

In addition to the normal circulation of air by the blowers, auxiliary fans are to be provided with sufficient capacity to produce wind velocities up to 50 miles per hour, thus giving any desired *chill factor*.

Camping in Cold Chamber to test personnel equipment

The cooling capacity in the large chamber is sufficient for the continuous running of internal combustion engines of 160 horsepower down to —80°F., the exhaust gases being discharged outside and fresh air being brought in through condensation type driers. Larger engines may also be operated, but the minimum temperature attainable rises with increasing heat loads. It is also possible to pull the temperature of these rooms down from +70°F. to −70°F. in one hour, thus greatly facilitating experimental work.



Refrigeration Plant

Provision is made in the large chamber for the future installation of a 150 h.p. wheel dynamometer to measure power output of wheeled or tracked vehicles.

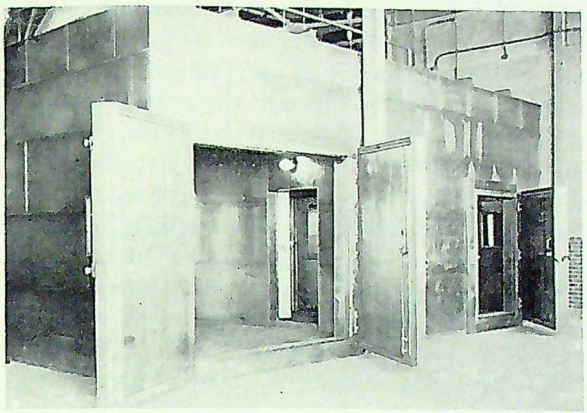
The cold chambers employ "Ferro-Therm" insulation consisting of 13 thin steel panels spaced $\frac{3}{8}$ in. apart and supported by a wooden frame. It is in effect an *air-gap* insulation which has low thermal "lag." It is compact and forms its own moisture barrier. Observation windows are provided at various points around the rooms, and their construction is similar to that of the walls, consisting of several layers of glass with air spaces between, in which are silica gel driers to prevent internal frosting.

Easy access to the cold chambers during the running of tests, without admitting large volumes of warm, moist air, is afforded by air locks. These air locks have small evaporator coils and fans of their own and are held at a temperature intermediate between the chamber and the room.

Icing Wind Tunnel

Heretofore, the Low Temperature Laboratory has been primarily concerned with the development of means of overcoming the formation of ice on aircraft. The electro-thermal method of propeller de-icing now coming into general use was originally developed and tested here some years ago.

In the past it was always necessary to test new



Small cold chambers

developments of de-icing technique in flight under natural icing conditions, with consequent hazards to the aircraft and its crew. In fact, in the course of this project, three aircraft have been lost. Furthermore, the installation of experimental equipment on the aircraft presented many difficulties, and the relative infrequency and variability of natural icing made the progress of development work painfully slow.

In consequence, the need for an icing wind tunnel was appreciated at an early stage, and the refrigeration plant of the Laboratory was designed to serve the dual purpose of producing low temperatures both in cold chambers and in a wind tunnel. In this way, tests may be carried out under controlled conditions regardless of the season of the year, the local weather, or aircraft serviceability. As a result, the effectiveness of the necessary flight tests will also be greatly increased.

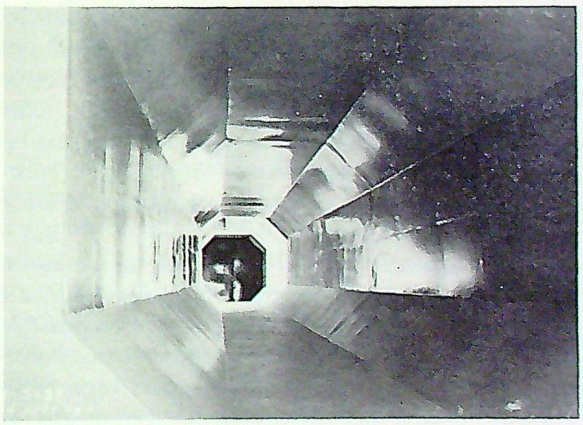
The Icing Tunnel is of the closed return circuit type and has a closed working section 4½ ft. square. The total driving power of 1,000 horsepower, operating a 6-bladed fan, is capable of producing a windspeed of 260 miles per hour in the working section, while the refrigeration equipment, functioning at its maximum capacity of 250 tons, can reduce the working temperature to —20°C. (—4°F.) at maximum speed, and by reducing the speed somewhat, temperatures as low as —40° can be obtained.

In order to simulate icing conditions in the wind tunnel, water will be sprayed into the air stream in the form of fine droplets some distance ahead of the model mounted in the working section. The water droplets, upon entering the cold air stream, rapidly become supercooled, and upon their striking the model's surface, ice is formed as in nature. By varying droplet size, liquid water content, and temperature, any natural icing conditions may be reproduced.

Types of Tests

The large size of the cold rooms and the versatility of the equipment permits the conduct at full scale of almost any type of cold weather test which might conceivably be required. Representative examples of the many and various types of testing which can be carried out in the Low Temperature Laboratory are given in the following paragraphs.

Perhaps the most obvious type of test that may be made is the cold weather starting and running of mechanical vehicles (which has always been a pressing problem), and of internal combustion engines generally, including aircraft engines, auxiliary power plants, and possibly component parts of gas turbine engines or rockets.



Icing Wind Tunnel

Another large part of the work will be concerned with heating systems for vehicles and shelters. For example, a section of the cabin of a large commercial transport aircraft has undergone heating and ventilating tests in the large cold

chamber, so that the layout of the heating system might be decided upon in advance of the construction of the prototype aircraft.

In recent years, much attention has been devoted to overcoming difficulties with lubricating oil and fuel systems, both in ground vehicles and aircraft. As an example, the oil dilution system of a large Canadian military transport aircraft has been proof-tested in the cold chambers of the Laboratory. A related project has been the investigation of fuel systems for oil-burning railway locomotives which are troubled by "flocculation" of the fuel oil at low temperatures.

A serious problem which arises during the operation of aircraft at high altitudes and low temperatures is the functioning of mechanical, hydraulic, and pneumatic control systems. Owing to differential expansion, the wire cables operating the control surfaces become slack, hydraulic seals tend to leak, and frequently actuators seize-up. To study this problem, the entire fuselage of an aircraft can be mounted in the large cold chamber.

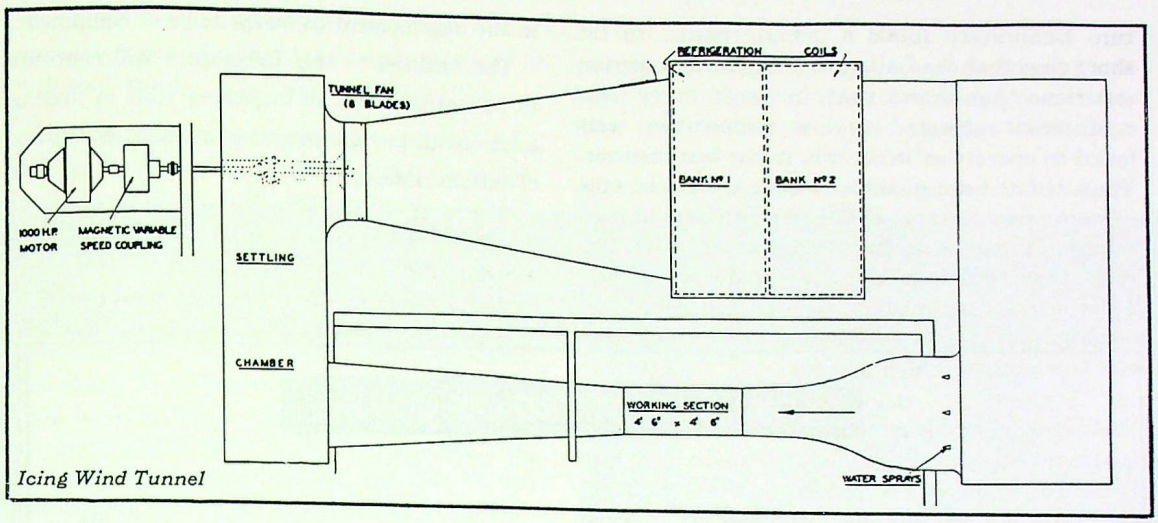
Another problem is the shattering of plastic canopies on aircraft when flying at low temperatures. On account of differential expansion between the plastic and the metal (the plastic expanding 4 times as much as dural), the canopy is highly stressed and at low temperatures the material becomes embrittled to such an extent that a slight impact may cause it to shatter. This difficulty is accentuated by the use of pressure cabins, and the recent loss of a navigator occasioned by "blowing out" of the astro-dome forcibly illustrated the problem.

The development of suitable clothing for use in the Arctic has always presented a very difficult problem. In the cold chambers, it will be possible to expedite this development greatly. As a corollary to the work, the physiological aspects of exposure to cold and the development of means for survival could very well be carried out by isolating a group of human "guinea pigs" in the large cold chamber, where their reactions could be closely observed from the outside.

Operation of practically every item of mechanical equipment and communications equipment in the Arctic depends upon the use of storage batteries. The conventional type of lead-acid battery delivers less than 20 per cent of its normal output at −40°F. Therefore a very considerable effort is now being directed toward the provision of new types of batteries having better performance at low temperatures, or, alternatively, towards the discovery of a means for maintaining the performance of existing types of batteries at these low temperatures. New developments in this field are being tested in the Laboratory, and one new type delivered 25% of its normal output at as low as −60°F. in recent tests.

The problems of embrittlement of materials at low temperatures are now recognized, but there is a very considerable need for accurate data on the strength and behaviour of the whole range of structural materials under these conditions. In

Anti-aircraft gun undergoing low-temperature tests



Icing Wind Tunnel

particular, serious problems exist in making welded joints at low temperatures. The effects of freezing and thawing cycles on various building materials have also been investigated.

The hazard of fire is ever present in the Arctic both on the ground and in the air, and hence the proper operation of fire extinguishers is important. The conventional fire-extinguisher is practically useless at low temperatures either on account of freezing or of reduced pressure in the vapour types. Also, rubber hoses become brittle at only moderately low temperatures. The problem may be particularly serious on aircraft where, in addition to their purpose of fire-extinguishing, CO_2 bottles are employed for emergency undercarriage extension and similar duties.

In the Icing Tunnel it will be possible to test at full scale the thermal, chemical and mechanical methods of preventing ice formation on aircraft propellers, wings, controls, radio antennae, windshields, etc. As an example, the electro-thermal method of propeller de-icing, which is now coming into general use, was originally developed and tested here some years ago.

The study of the icing characteristics and means for the protection of both reciprocating and jet type engines is of major importance. Jet engines are particularly susceptible to ice formation and may fail in as short a time as 4 minutes, and in some cases the failure may be catastrophic, entirely destroying the compressor blading. The anti-icing of a new Canadian jet engine has been investigated by this Laboratory.

In addition to icing tests, the Icing Wind Tunnel may be used for studies of heat transfer from bodies of various contours and with various surface textures at different air velocities and temperatures. Heat transfer relations at high velocities are becoming increasingly important in connection with the design of high speed aircraft and thermodynamics generally. On the fundamental side of research, heat transfer problems of many types may be investigated under both static and dynamic conditions.

Studies of various aspects of Cloud Physics in connection with aircraft icing and induced precipitation have also been undertaken. A related project is the study of snow mechanics, and for this purpose a method was devised for artificially generating snow in the Laboratory, employing a technique similar to the simulation of icing in the tunnel. The variation in snow properties with time and temperature cycles can be closely studied in the cold chamber. This work has an important bearing upon surface transportation in the Arctic and snow clearance from highways and airports.

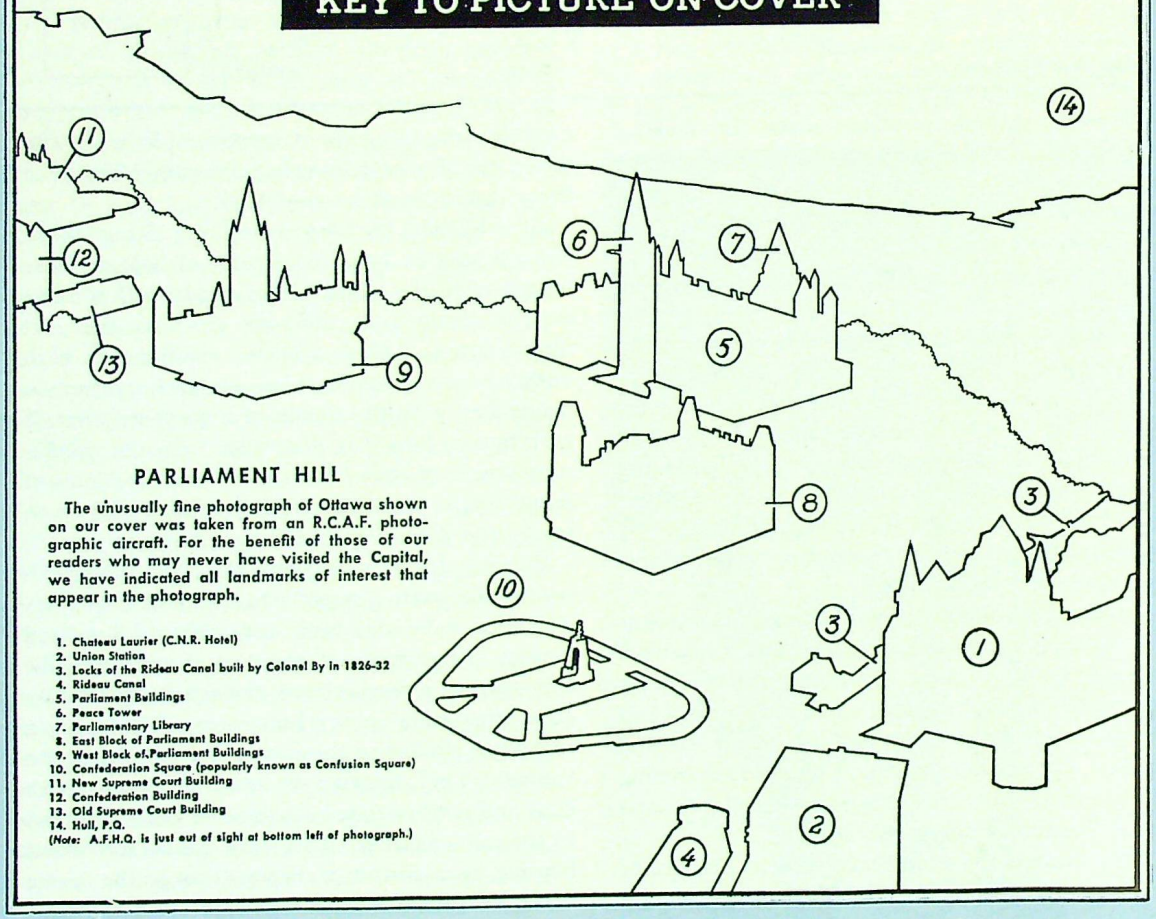
Conclusion

It is apparent from the volume and variety of work already submitted that the Low Tempera-

ture Laboratory fulfils a definite need. In the short time that the Laboratory has been in service, experience has shown that, in nearly every case, equipment subjected to low temperature tests failed to operate satisfactorily in the first instance. Thus, it has been possible to save several months in the development of many items of equipment.

The facilities of this Laboratory will continue to be employed on an increasing scale in finding solutions to low temperature problems which are of national interest.

KEY TO PICTURE ON COVER



PARLIAMENT HILL

The unusually fine photograph of Ottawa shown on our cover was taken from an R.C.A.F. photographic aircraft. For the benefit of those of our readers who may never have visited the Capital, we have indicated all landmarks of interest that appear in the photograph.

1. Chateau Laurier (C.N.R. Hotel)
2. Union Station
3. Locks of the Rideau Canal built by Colonel By in 1826-32
4. Rideau Canal
5. Parliament Buildings
6. Peace Tower
7. Parliamentary Library
8. East Block of Parliament Buildings
9. West Block of Parliament Buildings
10. Confederation Square (popularly known as Confusion Square)
11. New Supreme Court Building
12. Confederation Building
13. Old Supreme Court Building
14. Hull, P.Q.

(Note: A.F.H.Q. is just out of sight at bottom left of photograph.)

THE PIPERS OF ROCKCLIFFE

"And if a man can play the pipes,
For God's sake, let him play!"

LAST DECEMBER the personnel of R.C.A.F. Station, Rockcliffe, went even further than poet John Bennett in their broad-minded attitude towards Scotland's national musical weapon. They gave their enthusiastic encouragement to the formation of a pipe-band in which most of the pipers did *not* know how to play. Nevertheless, their faith was justified. Under the skilled leadership of Sgt. E. J. Eccles, a veteran drummer, and LAC A. R. Mitchell, piper of 12 years' standing, the questionable skirls of the first practice night were rapidly co-ordinated into the stirring harmonies that thrilled the public on Air Force Day. As the R.C.A.F.'s only pipe-band, consisting of fourteen pipers and eight drummers, swung along the Rockcliffe tarmac to the gallant strains of "Highland Laddie," they played like veterans of the heather-clad hills.

When Sgt. Eccles and LAC Mitchell, having decided that Rockcliffe must have its own pipe-band, took stock of those who eagerly offered them their services as musicians, they found that

Hot music on the practice chanter by LAC R. B. Roddy

Pipe-Major LAC A. R. Mitchell performs on the practice chanter for two small listeners

only three of them had ever played the pipes and that several of them could not even read music. As regards drummers they were better off, since most of the applicants had had previous experience. Nothing daunted, the two men set to work. Bagpipes were generously lent by the Army, and surplus drums were located on the Station. A dozen practice chanters were purchased through the Station Canteen Fund, and the band was all set.

The pipers held their first practice on January 17th, under Pipe-Major Mitchell, while the drummers got together two days later for their initial try-out, under Sgt. Eccles and Sgt. H. Wyman, of the Cameron Highlanders, who very kindly lent his services. Practices were held regularly twice

12 members of the band. Left to right: AC R. L. Hinks, LAC G. D. Hardy, LAC R. D. Huges, AC W. D. Frickleton, Sgt. E. J. Eccles, LAC H. G. O'Bear, Sgt. W. R. Edwards, AC G. D. Elliott, LAC J. H. Paveling, LAC A. R. Mitchell, LAC W. J. Davidson, LAC M. Young.

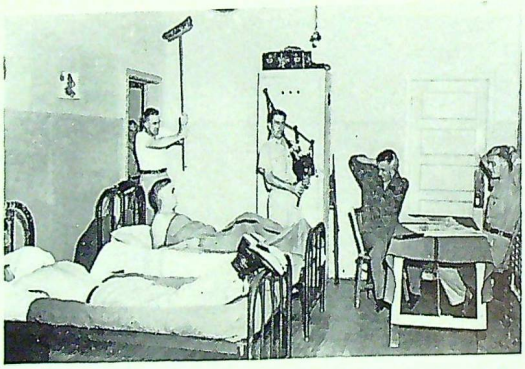
a week at night after that, and the progress of the student pipers surprised everyone.

"What they lacked in experience they soon began to make up for by their enthusiasm," says LAC Mitchell. "Everyone turned up faithfully for practice, and almost every time you came across one of the pipers after duty hours, he was playing on his practice chanter."

The band made its first appearance as a unit in March, and has since played once a week on the Commanding Officer's parade.

The band is purely voluntary, as no official establishment is provided for it. As already mentioned, it is the only pipe-band in the Regular R.C.A.F., although 400 (City of Toronto) Reserve Squadron has boasted one for some time past, while 401 Reserve Squadron, Montreal, has recently formed another. The Toronto band appears in full Highland regalia, wearing the official R.C.A.F. tartan. The boys of the Rockcliffe band, who at present wear ordinary Air Force uniforms, hope that some day they too will be able to add the finishing sartorial touch to their music.

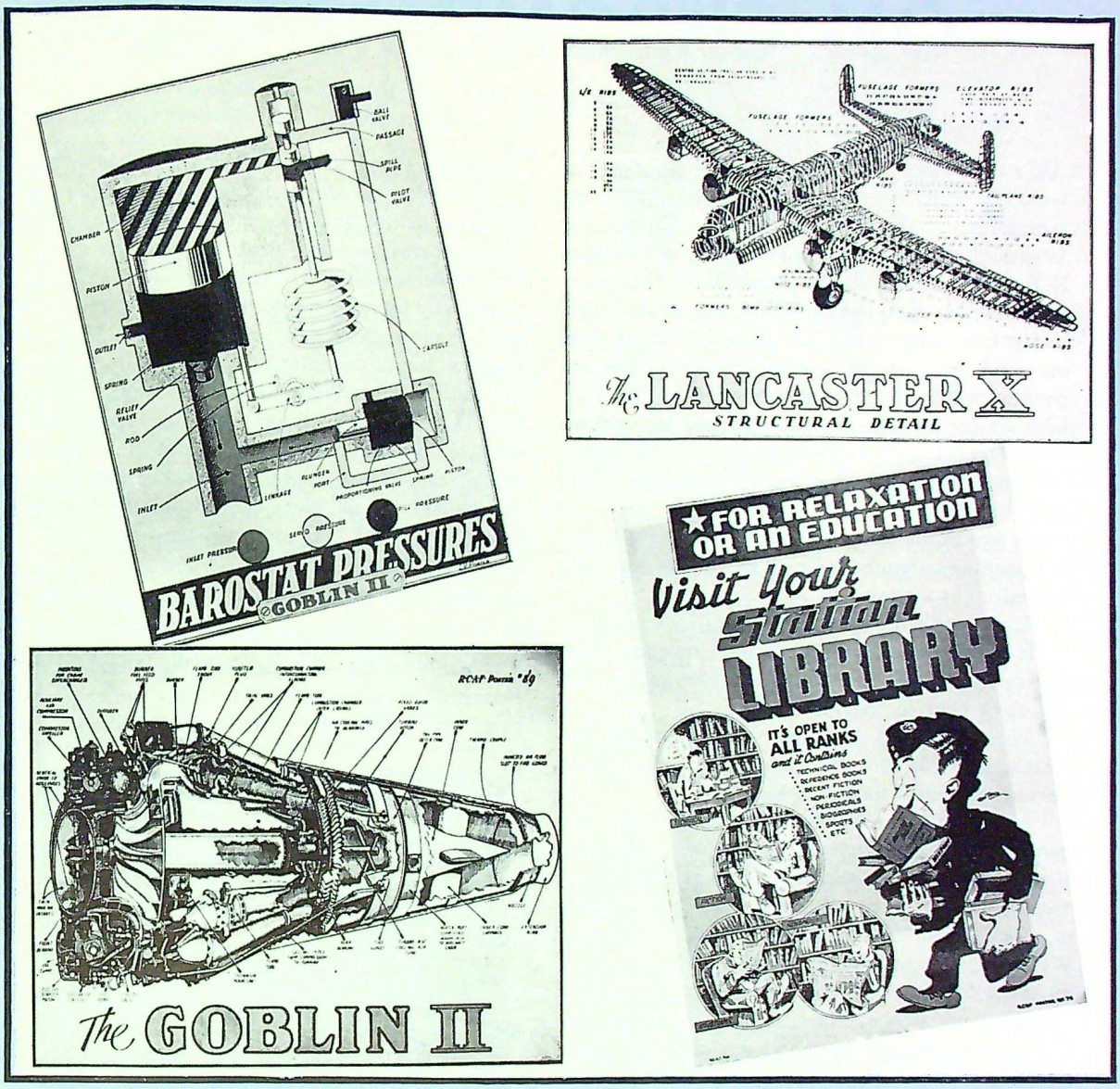
The chief fear of the band's founders at present is that their bagpipe baby may be broken up by postings, for normal posting procedure must naturally be adhered to by the Service. They have already lost one of their best pipers in this fashion —LAC L. B. Tupper, who was formerly a piper with the Pictou Highlanders. Fortunately, there's no shortage of recuits, and Sgt. Eccles and Pipe Major LAC Mitchell feel that the band has a firm enough footing to survive, even though it may eventually lose its present members as postings come along.



LAC O'Bear delights his friends

Everyone at Rockcliffe, from the C.O. down, is exceedingly proud of their pipe-band, even though they are apt to pass out the traditional ribbing now and then—as evidenced in one or two of the accompanying photographs.

Have You Seen these Posters?



RCAF Poster No. 74: Lancaster X - Structural Details
RCAF Poster No. 75: Visit Your Station Library
RCAF Poster No. 89: The Goblin II
RCAF Poster No. 91: Barostat Pressures - Goblin II

ORDER WHAT YOU WANT FROM YOUR SUPPLY SECTION

The Old Historian Speaks-

ON CHRONOMETERS

(Reprinted by courtesy of "Air Clues")

WE FELT WE COULDN'T FINISH this series of articles without mention of that most important of the navigator's tools of his trade—the chronometer. Whether it be for taking astro sights, determining E.T.A.s, dropping bombs, or merely for the more mundane purpose of keeping dates on time, navigators—and indeed all of us—are dependent on some sort of timekeeper, from the five-bob pocket watch to the grandfather clock. So without further ado we collected our hat, pencil, and notebook and went off to find our old friend the historian to see what the score was on clocks and the like.

He was in his usual place at the end of the bar, the usual near-empty tankard in front of him. He looked up as we came in.

"Have you time for another one?" we asked.

He fished out an enormous gold repeater from his waistcoat pocket, looked at it, checked it with the clock over the bar, and said:

"Well, I should hope so. According to my watch, I've got time for quite a few before these barbarians throw us out of here."

"And that," we said, "is precisely what we came to see you about—this question of what time it is. It makes a difference to us navigators, you know, and we're quite interested in the origins of clocks, watches, chronometers, and suchlike. We thought you might have a few pearls of wisdom on the subject to lay before us. What about it?"

There was silence while the barmaid performed her mystic rites and we had a couple of quick swallows.

Sun-Dials and Shadow Pillars

"Well," replied the Old Man at last, "I've got quite a few pearls of wisdom to lay before you if you can call them such, and if you've got the time to listen—which I presume you have. And, as usual, I suppose you'll want me to start right at the beginning. Also, as usual, these things go back so far that it's very hard to see the beginnings.

"However, we do know that the Greeks and Romans, as well as the Egyptians and many other ancient races, were not slow to realize the advantage of being able to tell the time. And this they did mainly by reference to the sun, using sun-dials and shadow pillars which threw shadows of varying length in different directions during the day-time. As you can imagine, that sort of thing was all very well for those people who spent their days out in the open watching sun-dials, but it wasn't so good for those who worked indoors or for anybody at all when the sun wasn't shining. That's why the first chronometer—of a sort—came into being."

"And which one might that be?" we queried.

The Ancients' Water-Clock

"That was the clepsydra of the Greeks and Romans," answered the Old Man, "which measured time by the flow of water from a vessel. In

John Harrison, 1693-1776. (From the mezzotint by Tassaert, after the portrait by King, in the National Maritime Museum).

its simplest form it consisted of a short-necked goblet of known capacity, pierced at the bottom with several small holes through which the water placed in it escaped or stole away. Funnily enough, its first use was to stop people from talking too much, and for this reason it was employed in the Courts of Justice to set a limit to the length of speeches made by the lawyers. Hence the phrases *aquam dare,* to give the advocates speaking time, and *aquam perdere,* to waste time.

We recalled our experiences of the old pre-war egg-timers and ventured the opinion that these clepsydras must have been rough and ready timekeepers.

"I couldn't agree more," said the Old Man. "The clepsydra suffered from two main defects—first, that the flow of water varied with the temperature and pressure of the air, and second, that the rate of flow became less as the vessel emptied itself. Now the first of these problems was wellnigh insuperable in those days: the second was sorted out by keeping the level of water in the clepsydra uniform, a note being kept of that discharged.

"Ctesibius of Alexandria improved on this primitive method of timekeeping with his hydraulic clock which he made in about 135 B.C. In this clock, the movement of the water-wheels cau ed the gradual rise of a little figure, which pointed out the hours on an index, so that there was no need to measure the water which came out of the machine. However, there's no need to construct one of these little figures if you're thinking of making a water-clock. Provided you understand that the rate of flow of water through an orifice is proportional to the square of the vertical distance of the water's upper surface from the orifice, you can construct a simple clepsydra by making, in the bottom of a glass cylinder, an opening through which its contents can escape in twelve hours. Then all you've got to do is to graduate the side of your vessel into 144 ($=12^2$) parts, and a mark at division 121 ($=11^2$) from the bottom will indicate the water remaining at the end of the first hour, and, in like manner, the squares of 10, 9, 8, and so on will give the divisions to which the level of the water descends at the end of the second, third, fourth, and succeeding hours respectively."

Astronomical Clock—Middle 16th century.

We promised to try it out when we had both the glass vessel and the time, and reminded the Old Man that we were really interested in the chronometer from a navigational standpoint. We hardly thought that the clepsydra would be much good in taking star sights, however accurately we constructed it.

His tankard stood empty and we could see that the cause of chronometers had no hope of prospering while such a state of affairs existed, so we duly replenished it for him.

A Prize Incentive

"From a navigational point of view," resumed the Old Man, after a long draught, "interest in the chronometer became acute because of its use in determining longitude. So that's probably what concerns you most. In the old days it was thought that longitude could be determined by measuring the change of magnetic variation. Charles the Second even patronized an investigation into this theory; but as you can imagine, it didn't produce the desired result. Next was St. Pierre, who suggested observations on the moon's position among the stars, but lunar details were pretty sketchy in those days and the observing instruments weren't accurate enough, so that scheme fell through, too.

"After that there seemed only one way of stimulating interest in the subject—to offer a prize to

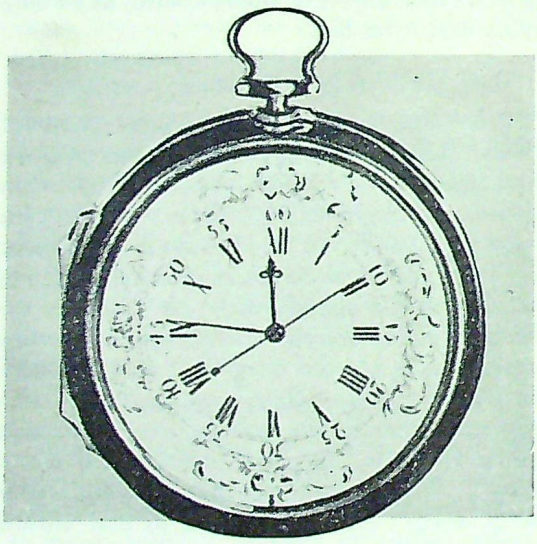
the character who would sort it all out. Philip III of Spain accordingly offered 1,000 crowns—quite a large sum of money then. Not to be outdone, the French capped this offer with another of 10,000 florins. Indeed, the anxiety of the Spanish and French to have a handy means of determining longitude is understandable: previously some of their more famous admirals and sailors had been as much as three or four thousand miles out in their longitude. So the problem was a bit urgent as you might say."

"And did anyone collect the money?" we inquired.

Timekeeper Designs

Whether anybody collected the prizes, the Old Man wasn't prepared to say.

"I do know, however," he remarked, "that the first suggestion that clocks should be used to determine longitude came from Gemma Frisius, the teacher of Mercator, in about 1530. Galileo, in his time off from inventing telescopes, suggested the idea of pendulum clocks for the job, and some while later, in 1657, Christian Huyghens, the discoverer of Saturn's rings, actually designed a timekeeper for marine use. But in allotting credit for the design of the chronometer, we mustn't forget our old friend Pacificus, the Archdeacon of Verona, who, at the beginning of the 9th century, had discovered the escapement device controlling the locking and unlocking of the springs and wheels in a chronometer and which is a fundamental unit in all modern chronometers.



Harrison's No. 4 Timekeeper, which won the £20,000 reward. Completed in 1757. (Navigation Room, National Maritime Museum).

"From Huyghens we pass on to Robert Hooke, who incorporated an escapement device in Huyghens' watch. Nevertheless, even with this modification, the watch was never very successful and was finally rejected for marine use. After Hooke came a Yorkshireman by the name of Jeremy Thatcher, who also worked on the problem and tried out a vacuum pattern in 1714. This was not successful either, although it is interesting to note that it was Thatcher who first put the word 'chronometer' into the English language."

A Board of Longitude

"But you still haven't told us who invented the first successful chronometer," we said.

"I'm just coming to that," replied the Old Man. "In 1713, several British ship owners requested Parliament to set up a committee to investigate the problem of longitude determination and to offer a reward for its solution. Nowadays, of course, it's not necessary for people to petition Parliament to set up committees . . . but that's neither here nor there. Anyway, after the request had gone through the usual channels, a Board of Longitude was, in fact, set up the following year. This Board offered a reward of £20,000 for the chronometer the undiscovered rate of error of which did not exceed three seconds per day over a fairly long period. The Government of the time was extremely modern in the respect that the Board which it set up was very large and that very few of its members knew anything at all about the subject being investigated. But there, I mustn't digress.

"Some fourteen years later, in 1728, a young Yorkshire carpenter— John Harrison by name— came to London with the completed drawings of his chronometer. Unfortunately, he didn't have the money to have the thing constructed, so he

applied to the Board for assistance—but, naturally, they weren't very interested. All the same, Harrison was not to be deterred; six years later he made one himself which the Admiralty tried out in H.M.S. *Centurion*. It maintained the desired accuracy to qualify for the prize."

The Old Man paused for refreshment.

"So Harrison won the prize then?" we ventured.

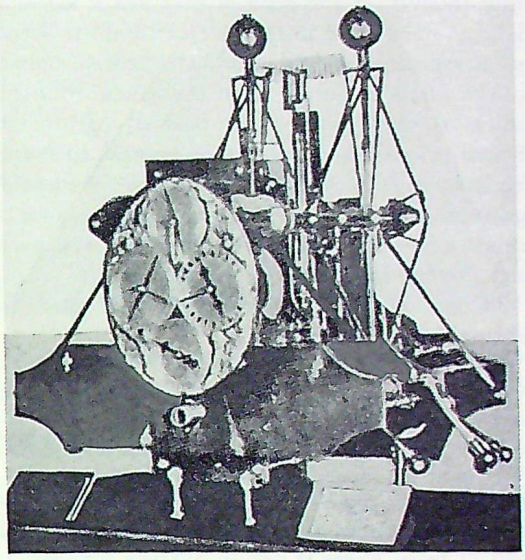
"The Most Famous Timekeeper"

The Old Man chuckled.

"Well, he did," he admitted; "but the Board didn't exactly fall over itself to give it to him. Harrison had produced his first timekeeper in 1734, as I've told you. Throughout the years which followed, the Board advanced Harrison small sums of money from time to time to enable him to pursue his experiments, but refused to pay him the prize money. By 1741, Harrison had made a second timekeeper. Seventeen years later, in 1757, he produced his third timekeeper and also his famous watch, of which friend Gould says: 'The most famous timekeeper which has ever been or ever will be made'.

"This watch—Harrison's No. 4—was tested for the £20,000 prize in 1761, some twenty-seven years after he had fairly won the prize, on a voyage to Madeira. The navigation was conducted by the watch, much to the alarm of the crew, who, to quote a contemporary account, 'were terrified lest they should miss the island . . . the consequences whereof would have been inconvenient as they were in want of beer.' Well, they got to Madeira all right and presumably they got their beer. In 1765, after much haggling, and thirty years after he had won the prize with his No. 1 timekeeper, Harrison was paid half the prize money. The other half was paid eight years later after the personal intervention of the King, George III. By this time Harrison was an old man of over 80 and the shock of getting any money at all from the Board must have proved too much for him—he died within the next three years. Such are the rewards of industry."

We nodded in sympathetic agreement and looked at our watch. The time was a quarter to ten.



Harrison's No. 1 Timekeeper. (Navigation Room, National Maritime Museum).

"The Creator of the Modern Marine Chronometer"

"There's not much to tell after that," continued the Old Man. "In 1766, Pierre Le Roy, a Parisian, perfected his own chronometer. It was a real advance on Harrison's No. 4 and incorporated several devices employed in modern chronometers. Some years later Arnold and Earnshaw, the latter particularly, began to turn out excellent chronometers at quite a reasonable price, and their chronometers have remained practically unchanged for the last century and a half. If you care to have a look in St. Giles' Church, Holborn, you'll find on the wall a plaque to the memory of Earnshaw which describes him as: 'The Creator of the Modern Marine Chronometer,' which he undoubtedly was."

"Time, gentlemen, please!" came the dulcet tones of the barmaid.

The Old Man again fished out his great gold watch and looked at it almost angrily.

"Ignoring the interruption," he said, "although Earnshaw is described as the creator of the modern marine chronometer, one mustn't forget the hard work put in by Harrison. It was he who

first showed, at the price of fifty years' incessant labour, conducted in the face of complete scepticism representing the informed scientific opinion of the whole of Europe, that the annual tribute of ships, treasure, and blood paid as part of the heavy price of Admiralty need be paid no longer. He was, in fact, a man of whom we—the world's greatest maritime nation—have much cause to think gratefully, and of whom we have every right to feel immensely proud."

"Come along, gentlemen, *please,*" said the barmaid more sharply.

Closing Time

"And after all the centuries of work which have been put into producing a reasonable timekeeper," pursued the Old Man crossly, "the only use which that girl behind the bar can find for the clock above her head, is to look at it to see whether it's time to throw us out. Disheartening, isn't it?"

We agreed. And we couldn't help feeling that his was a pretty damning comment on our present-day civilization.

RESEARCH PERILOUS

AN ENGLISH SOCIOLOGICAL STUDY called "The Pub and the People" deals with the drinking habits of the British proletariat. The authors go very thoroughly into the question of how long it takes to consume a pint of beer. There is not an average time for a gill (English), the article points out, the time varying from night to night. The researchers go on to present a table showing the time required by 443 beer drinkers in four 'pubs' to knock off a half pint. The time varies from 7.9 minutes on a Saturday, to 13.5 minutes on Tuesday night. A Tuesday night elbow-bender is evidently not in the hurried, bottoms-up mood that comes over him on the Saturday evening. The authors make it clear that the accumulation of these facts is "difficult, laborious work," and we suspect, ourselves, that the investigator finds himself not so often abreast with the statistical table, as under it.

Any comment from our RAF friends?

At Greenwood, it is usually a case of the pint of beer having to last up to 20 minutes around the 13th and the 29th of the month. Sometimes, even the cokes have to last that long too.

(*"Wings over Greenwood"*)

(The earnest reader should bear in mind that an English pint of beer contains 20 fluid ounces, while in Canada the "pint" beer bottle holds only 12.—Editor).

AVERAGE AIRLINE PILOT

HOW DOES the average airline pilot compare with the average American male?

United Air Lines in a recent survey of its 800-man pilot force found its average pilot is three inches taller, four pounds heavier, has a greater chest expansion and better vision than U. S. males in the same age bracket on the basis of life insurance studies. But, like the average male, United's typical pilot smokes, needs eight hours of sleep a night, has a wife, and likes to putter arround his yard—if he has one. For hobbies he practices everything from photography to model building.

United's average pilot is 30 years old, 5 feet 10½ inches tall, weighs 161½ pounds, has an expanded chest measurement of 38 inches, can see at 20 feet what normally good eyes distinguish at 19, and has logged more than 5,000 hours, or about 1,000,000 miles, flying commercial airliners. He flies approximately 78 hours a month, never more than 85.

(*"Contact"*)

THE SCREW THREAD

(Reprinted by courtesy of the "Canadian Army Journal")

by Lt. Col. C. W. Jones, Assistant Director of Mechanical Engineering (Technical), Army Headquarters, Ottawa

(In our May issue we published a facsimile of the historic document wherein Britain, Canada, and the United States agreed to adopt the Unified Screw Threads. In the present interesting article, Lt. Col. Jones deals with the subject of screw threads from a historical as well as a contemporary viewpoint.—Editor)

On November 18, 1948 an agreement was signed in Washington that Canada, Great Britain and the United States would adopt a new standard series to be known as Unified Screw Threads, thus turning a new page in the long history of one of the six mechanical powers that have contributed so much to our civilization. The screw thread, which is now over 2000 years old, was invented by Archimedes, according to the following quotation: "And when there was great inquiry as to the best method of launching the great ship of Hiero of Syracusae into the sea, Archimedes, the great mechanician, launched it by himself with the aid of a few persons, for having prepared a helix (screw) he drew the vessel, as enormous as it was, into the sea. And Archimedes was the first person who ever invented the helix."

The writings of Vitruius and Palladius reveal that the Romans used the screw in fruit presses for the extraction of wine and oil, and a mural painting of the Chalcidium of Eumachia in Pompeii discloses a screw-operated clothes press.

Some insight of the early manufacture of screw threads is given in the writings of Pappus Alexandrinus, a 4th Century Greek mathematician, who describes a process in which a brass template in the form of a right-angle triangle was wrapped around a cylinder. The spiral line of the thread was traced along the edge of the template and the metal between these lines was removed, forming a screw.

Manufacturing methods developed along these crude lines until the 18th century when threads were cut by forcing an inclined knife against a cylinder in a primitive form of lathe. The angle of the blade was adjusted by set screws and cuts were made in wooden and then soft metal cylinders until a screw was produced which was considered sufficiently accurate to be employed as a guide screw in an apparatus similar in principle to the more modern screw-cutting lathe. It was not until 1766, when Ramsden invented his dividing engine, that any great strides were made in obtaining accuracy in originating screw threads.

The screw threads of this period, apart from being of crude manufacture, assumed many forms: the threads from one shop would not mate with threads from another of even the same locality. Engineer repairs were tedious and costly tasks. Engineering firms would develop their own peculiarities to ensure themselves of all repair trade on their own equipment.

The first attempt at standardization of the screw thread was made by Joseph Whitworth who presented his historic paper on screw thread standardization before the Institution of Civil Engineers in 1841. His paper was based on sound practical research, embodying a dimensional study of the proportions employed by all the chief English workshops. A thread angle of 55° was adopted and a table of bolts completed up to a six-inch diameter.

Whitworth's proposal was universally accepted and was adopted by German and American engineers and continued in use for some twenty years, when, during the American Civil War, certain embittered Anglo-American relationships resulted in an attack on the Whitworth standard by the Franklin Institute. The attack was sustained, and culminated in the adoption of the Sellers' simple equilateral triangular form with flat crests and roots as the American standard.

This form of thread, in addition to being easier to manufacture, permitted simple measuring methods to be employed.

In Germany the Whitworth standard fell in defeat in 1871 when the metric system was imposed by Imperial decree just after the Franco-Prussian war. It was obvious that the Whitworth thread with its inch sizes was impractical and in 1873 the metric standard devised by Delisle of Karlsruhe was proposed and adopted.

Disagreement having been reached on an international basis and an apparently satisfactory standard having been discarded, the next step was, of course, the formation of International Screw Thread Congresses at various periods with the aim of finding a new standard. Agreement was reached on a standard at Zurich in 1898 when the international metric thread was adopted, but the good intentions of the agreement were not universally supported, and the metric, Whitworth and Sellers' standards remained in general use.

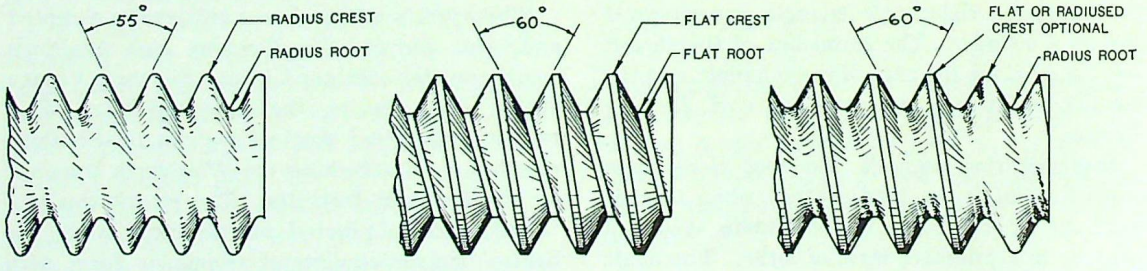
It was not until the First World War, however, that the Whitworth thread suffered a serious setback on the continent and it is considered in some quarters that an excellent opportunity was missed in 1917 for changing to a common standard embodying the best features of the Sellers' and Whitworth forms.

Discussions were held after the Americans entered the war and proposals were made, but no concrete action was taken to effect them. With the end of the war came loss of interest and, while the U.S. Congress appointed a screw thread commission, no great advancement was made until 1926 when a British mission visited America and proposed a 57½° thread angle which was turned down. The decision no doubt was influenced by the pre-depression industrial bonanza coupled with the disarmament conferences current at the time. It was to be 17 years before another standardization attempt would be made.

Unified Form Approved

The United States combined Production and Resources Board invited a British mission and a Canadian representative to Washington in 1943. Worthwhile progress was made and a further conference was held in London during August and September of 1944. The following year, in September and October 1945, a conference on the Unification of Engineering Standards was held in Ottawa. At this conference a unified form of thread having a 60° angle, together with screw sizes and pitches, was agreed upon, leaving only the problem of classes or grades of fits, along with tolerances to be settled. The tolerances and allowances were agreed to in July 1948 when a British mission visited Washington and the basic mathematical formulae were established. The way was then paved for the final accord.

The unified system employs the 60° angle and a rounded root to the thread, while the crest of the thread may be flat as in American practice or rounded as preferred by the British. The new thread has a larger minor diameter than the American or Sellers' profile and the angular depth is of course less in the unified than in the 55° Whitworth. The number of threads per inch for the various series of thread diameters has been unified and the limiting dimensions for three classes of fit have been agreed upon, thus making



BRITISH STANDARD WHITWORTH AMERICAN STANDARD UNIFIED SCREW THREAD FORM

interchangeability possible on an international basis.

This new thread series presents a radical departure from present British practice and by accepting it the British are giving much in the interests of standardization. In most cases the unified and Sellers' standards are, to a degree, interchangeable, which will of course facilitate the change-over in North American industry.

The standardized thread agreement is a pact of outstanding importance insofar as Allied industrial preparedness is concerned. Had it been in effect prior to the last war it is estimated that 600 million dollars and at least six months' time would have been saved. It is therefore essential to preparedness that this unified system be adopted without delay, and to do so will require a concentrated effort. It is a much easier and less costly task to develop a standard than to implement it in industry. The services will introduce the unified system in the development stage wherever practicable, and, in the design stage of any purely Canadian designed equipment, the responsible officers will explore fully the possibility and desirability of employing the new thread throughout, or even in parts of, the equipment. Preference will also be given to those commercial products which employ the unified thread.

Defence Preparedness

Industry as a whole is very much interested in defence preparedness. The problem is, of course, that individually each firm is manufacturing to earn money for its shareholders, and with the odd exception the earnings will not be increased by scrapping and replacing costly screw-cutting tackle in the plant. A gradual change by replacing worn equipment with the unified standard is difficult since there may be a time during this change-over period when a plant would be maintaining two sets of screw-cutting equipment.

It would seem that the change should be made rapidly with a view to minimizing confusion. The change should also be effected immediately and not left until a period of national emergency when, in all probability, it would be essential but impossible due to insufficient production capacity of screw-cutting equipment. The unified standard will not be an important factor in allied industrial preparedness until it is actually installed in the workshops of the nations, and no end of publicity, persuasion and push will be required to accomplish this. Let us not lose sight of the fact that it took between thirty and forty years to reach agreement on paper.

FLYERS' LIFE SPAN

The school of aviation medicine at Randolph Field, Texas, has recently completed a 27-year study on the effects of flying on officer personnel as reflected in their medical histories, and has found that flying duty materially reduces life expectancy and anticipated period of active duty.

The histories of flying and non-flying officers were recorded from 1920 to 1947 and the accumulated data, tabulated during the past two years, show that a man entering flying duty at the age of 22 has a life expectancy of 37.6 additional years, whereas a comparable non-flying Air Force officer may expect to live an additional 48.5 years, a difference of 11 years in favor of the ground man.

At 22, a flyer has an average of 24 years' active duty ahead of him, while the non-flyer can look forward to 29.9 years in uniform. Thus, flying reduces the period of active duty by six years.

An important consideration in the interpretation of these observed differences is the risk of death in an aviation accident. Flyers run an average risk of dying in an aviation accident equal to 9.1 per 1,000 per year, whereas the risk of death in a service-connected accident for non-flyers is only 0.8 per 1,000 per year.

("*Air Force*")

HOW IT ALL BEGAN

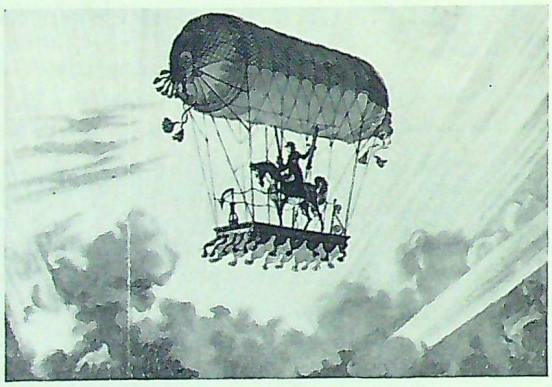
(Reprinted by courtesy of "The Aeroplane")

(The following article was written for "The Aeroplane" by Captain Laurence Pritchard, Hon. F. R. Ae. S., as a commentary on the eight prints which accompany it. The prints, here reproduced in black and white, are from the Hodgson-Cuthbert collection presented by Sir Frederick Handley Page to the Royal Aeronautical Society.—Editor)

IT ALL BEGAN with hot air.

The Montgolfier brothers were papermakers in France, and finding paper bags filled with hot air rose easily, they built a large paper balloon lined with linen to demonstrate their discovery publicly. Hot air wasn't as common then as it is nowadays. On June 5, 1783, the balloon, 110 ft. in diameter, filled with hot air and smoke from a wood fire, rose to a height of 6,000 ft., and the air age began!

In September they sent up a sheep, a cock and a duck; and satisfied with this test flight that a man might live in the air, another Frenchman, Pilâtre du Rozier, on October 15, 1783, made the first captive ascent by man and the first free flight on November 21. Only one of the Montgolfier brothers ever flew, Joseph, in the following year, and then only once, a fashion followed by many designers to the present day, so strong is tradition.

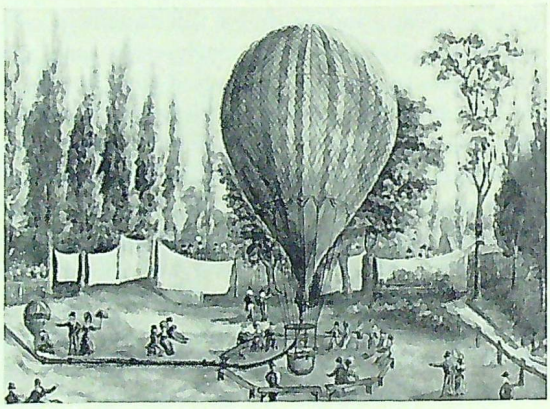


An airborne cavalier

Just over a month after the first hot-air flight Charles, a famous French physicist, and his mechanic, Robert, made the first flight in a hydrogen-inflated balloon, on December 1, 1783, to be precise. The flight lasted two hours, and the balloon rose to some 9,000 ft., which so alarmed Charles that this was his first and last flight.

The air has a peculiar attraction for the man in the street, especially when he doesn't fly. Balloons and intrepid aeronauts became the chief attractions at all aerostatic fêtes, and thousands paid their shillings to watch the first barnstormers of the air.

Then, on January 7, 1785, the inevitable happened. A Frenchman named Blanchard crossed



Green's balloon being prepared at the Mermaid Tavern, Hackney, on May 14, 1832, for his 100th ascent

the Channel by air from Dover to the Forest of Guines in a balloon that he had had fitted with a rudder and two pairs of oars to steer and row himself across. Nearly a hundred and twenty-four years later another Frenchman, Blériot, was the first to land at Dover from France in a heavier-than-air machine. The French had it both ways. Blanchard was the first to initiate Lend-Lease, persuading an American, Dr. Jefferies, to pay £700 towards the expenses and £100 for a seat in the balloon basket. The first cross-Channel flight cost well over £30 a mile, and even then didn't show a profit.

The first flight by an Englishman was by James Sadler, in a Montgolfier balloon, from Oxford, on

Garnerin's balloons at Napoleon's coronation

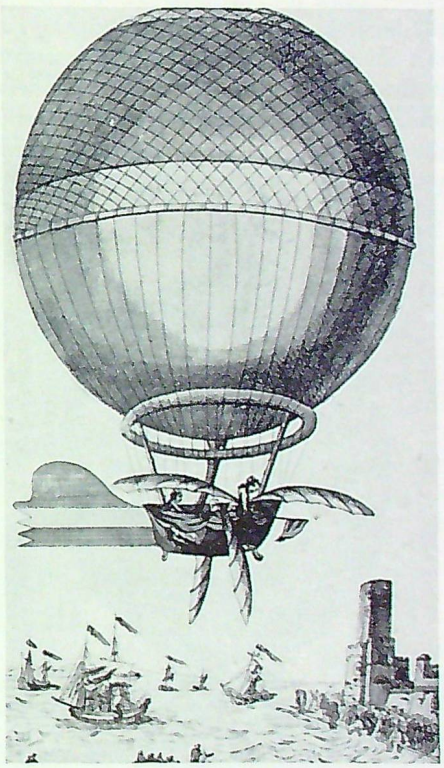
October 4, 1784. His flight lasted 30 mins. That was his only hot-air flight. On November 12 he made his first ascent in a hydrogen balloon, and had hopes of crossing the Channel. He was so disappointed when Blanchard succeeded that he gave up ballooning until 1810. Then, after a number of successful flights, he crossed to Dublin, and on October 1, 1812, rose before a great crowd and began his attempted flight across the Irish Sea. The journey at first was uneventful, but after passing south of the Isle of Man the balloon crossed to Anglesey at a great height. Unable to make a quick landing owing to an accident to the escape vent of the balloon, he drifted out to sea, and finally came down in the water near some boats. He was picked up and taken to Liverpool.

But in the whole history of ballooning in this country it was Charles Green who held all the records. In all, he made 527 ascents between 1821 and 1853, and he took his balloon to most of the large towns in England and many places on the Continent. On Tuesday, August 1, 1848, he "respectfully announces to the Inhabitants and Visitors of Maidenhead and its vicinity that he proposes making his 402nd ascent with his Royal Victoria Balloon, which had the honour to ascend from Cambridge in the presence of Her Majesty, His Royal Highness Prince Albert, the Duke of Wellington, Sir Robert Peel, and other distinguished Persons at His Royal Highness's installation in July last."

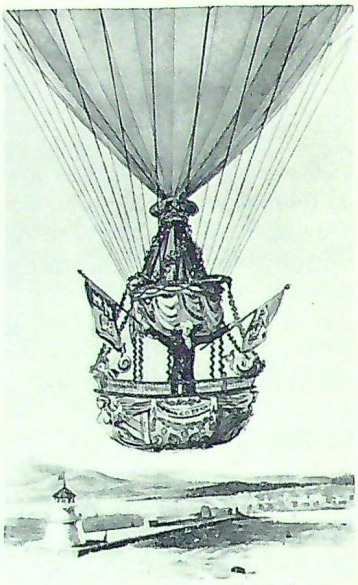
On the same poster announcing the event he also reminded his patrons that he was the proprietor of "Great Nassau Balloon, with which he performed the memorable Continental Trip from London to Nassau in Germany, a distance of 580 miles, in 18 hours." Altogether it is estimated that Green travelled over 10.000 miles by air.

As soon as man found he could get up in the air, he began to think of means of coming down safely in case of accident at height. The first public parachute descent was made by Garnerin, in 1797. In 1802 he came to London and made the first descent there on September 21. He usually sat in a car under the parachute, which was attached to the balloon. Both Garnerin's wife and niece became professional parachutists.

The crowning of Napoleon, on December 3, 1804, gave Garnerin, who had been appointed official organizer of balloon displays, the chance to show his mettle. He prepared a number of balloons decorated with flags with a wreath of laurels



Blanchard crossing the Channel with a fare-paying passenger



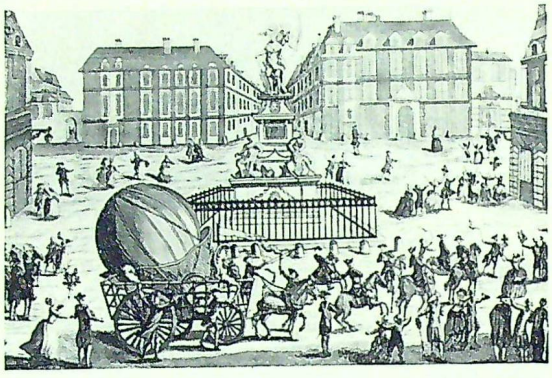
Salter crossing the Irish Sea

for the biggest. It was reported that this balloon crossed the Alps to Rome, where the wreath fell upon the tomb of Nero, a story that was not authenticated. In modern language Garnerin was shooting a line.

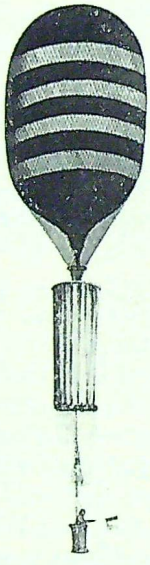
As ballooning became more and more popular

The Montgolfier hot-air balloon

competition between balloonists became more severe, to the benefit of the public. Nothing like competition in aviation to lower prices! All kinds of stunts were practised, as parachute drops by men mounted on ponies; by the ponies themselves;



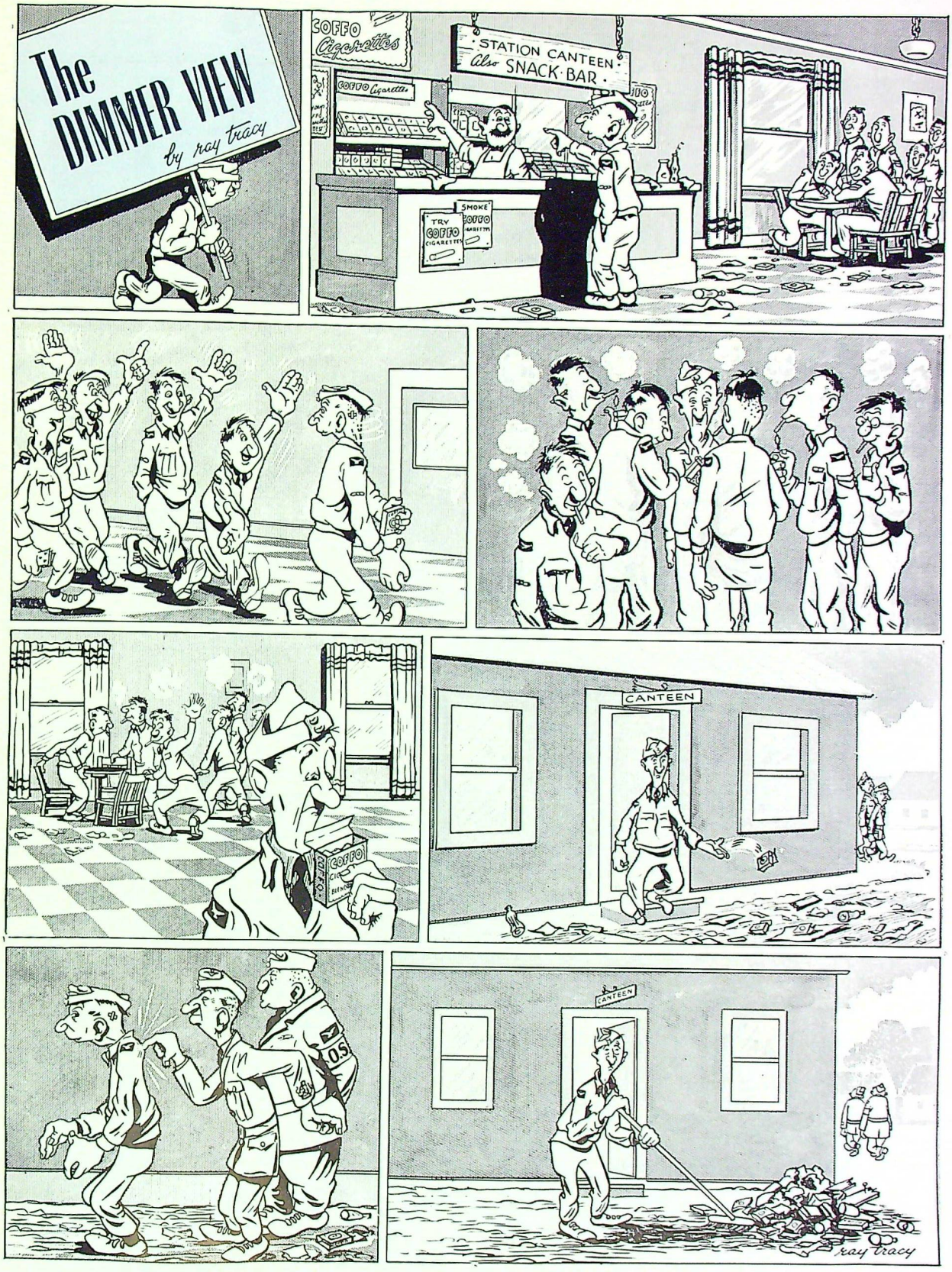
Charles and Robert returning after the first flight in a hydrogen balloon



Garnerin used to parachute in comfort

by firework displays, which led to disaster, and so on.

Charles Green, in 1838, even announced that he intended to make a flight accompanied by an animal trainer and a tiger, but he was prohibited from doing so in view of the danger of a landing and the possible escape of the tiger.


The DIMMER VIEW
by ray tracy
COFFO Cigarettes
STATION CANTEEN
Also SNACK BAR
COFFO Cigarettes
TRY COFFO CIGARETTES
SMOKE COFFO
CANTEEN
CANTEEN
ray tracy

★ LETTERS TO THE EDITOR ★

VERTEBRAE ACROSS THE SEA

Sir:

Having joined the Service shortly after Sgt. Shatterproof, and having made his personal acquaintance during my tour in Canada, may I hasten to lend my support to this gallant, upstanding-in-the-face-of-adversity N.C.O. He is a type, I regret to say, all too rare in the Services of to-day.

Shatterproofs were, and still are the vertebrae in the backbone of any Service, and it is an acknowledged fact among the cognoscenti that the Air Force has, in the matter of 'characters,' always boasted the best.

To-day, alas, only a few of us—loosely labelled by the Brass as too old, or having too many 'wet bar' stripes—are left. Even so we fight on, carrying the banner (Banners Mark III, with Eagle rampant on honourable knob), and hoping against hope that the incoming types will eventually realise and appreciate just what Shatterproof and men of his ilk have accomplished for them.

It is very gratifying to read that the ex-RAF C.O. of your Service Management School, having been well instructed in both Services, immediately appreciated the value of Sgt. Shatterproof. He must indeed be an "officer of some discrimination".

In conclusion may I wish my old friend every success and at the same time express the hope that, having now passed the Service Management Course, he will be considered by the Brass as worthy at least of the restoration of his crown.

I have the honour to be, Sir,

your obedient servant,
Sgt. Snag, R.A.F.

(Sgt. Snag's letter has been forwarded to Sgt. Shatterproof.—Editor)

YIPES!

Sir:

We in the field cannot let it go any longer! We have waited for Sgt. Shatterproof or the "What's the Score?" quiz-masters to refer "The Roundel" to AFAO A1/2 App. "D."

Where did you dig up "Sqn. Ldr.," Flt. Lt." and "F/Sgt."? Yipes!

Sgt. E. Maguss

(Sgt. Maguss' anguished cry does him credit. However, it is thought that the many non-Air Force readers into whose hands "The Roundel" finds its way are more likely to understand our irregular rank abbreviations than they would such designations as S/L, F/L, F/S., etc. We do not recommend that our licence in this respect be adopted by any member of the R.C.A.F. in his official correspondence!—Editor)

★

Answers to "What's the Score?"

1: (c)	2: (d)	3: (a)	4: (c)
5: (b)	6: (c)	7: (c)	8: (c)
9: (c)	10: (d)	11: (d)	12: (c)
13: (d)	14: (c)	15: (c)	16: (b)
17: (a)	18: (d)	19: (d)	20: (c)

IT'S AN ALBATROSS!

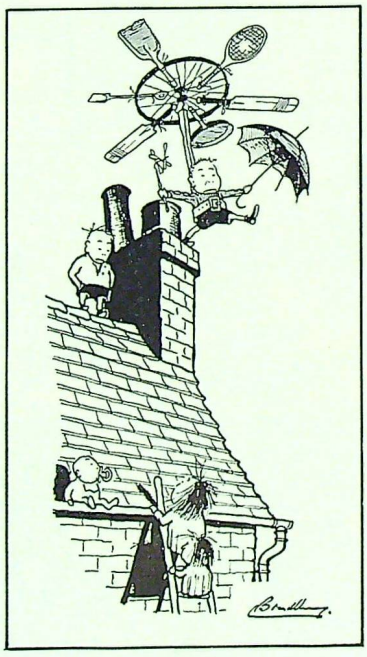
Sir:

With reference to the erroneous and very misleading article in your August issue which may seduce serving members of the R.C.A.F. into believing (quite wrongly) that the bird on badges, buttons, etc. is an eagle—how did this article ever pass the discerning eye of Sgt. Shatterproof with his extensive Service knowledge? Surely he knew that this was just another case where the Brass was wrong yet again.

About eighteen months ago, in the English version of "Twenty Questions" over the B.B.C., one of the questions put to the team by Stewart MacPherson, the very versatile and popular Canadian Quizmaster, concerned "The Eagles on an Airman's Tunic." That really started it. At once the B.B.C. was deluged by 'phone calls, and before the end of the broadcast MacPherson had to plead that he was very, very neutral and wanted no part in the war, anyway. For days afterwards letters poured into him by the thousand from all over the country, and he had to cry "Enough!" both over the radio and in the daily press. Eventually the matter was referred to Air Ministry, who, of course, ruled that it was in fact an eagle. If I remember correctly, though, the original designer was also consulted and admitted that his design was based on an albatross.

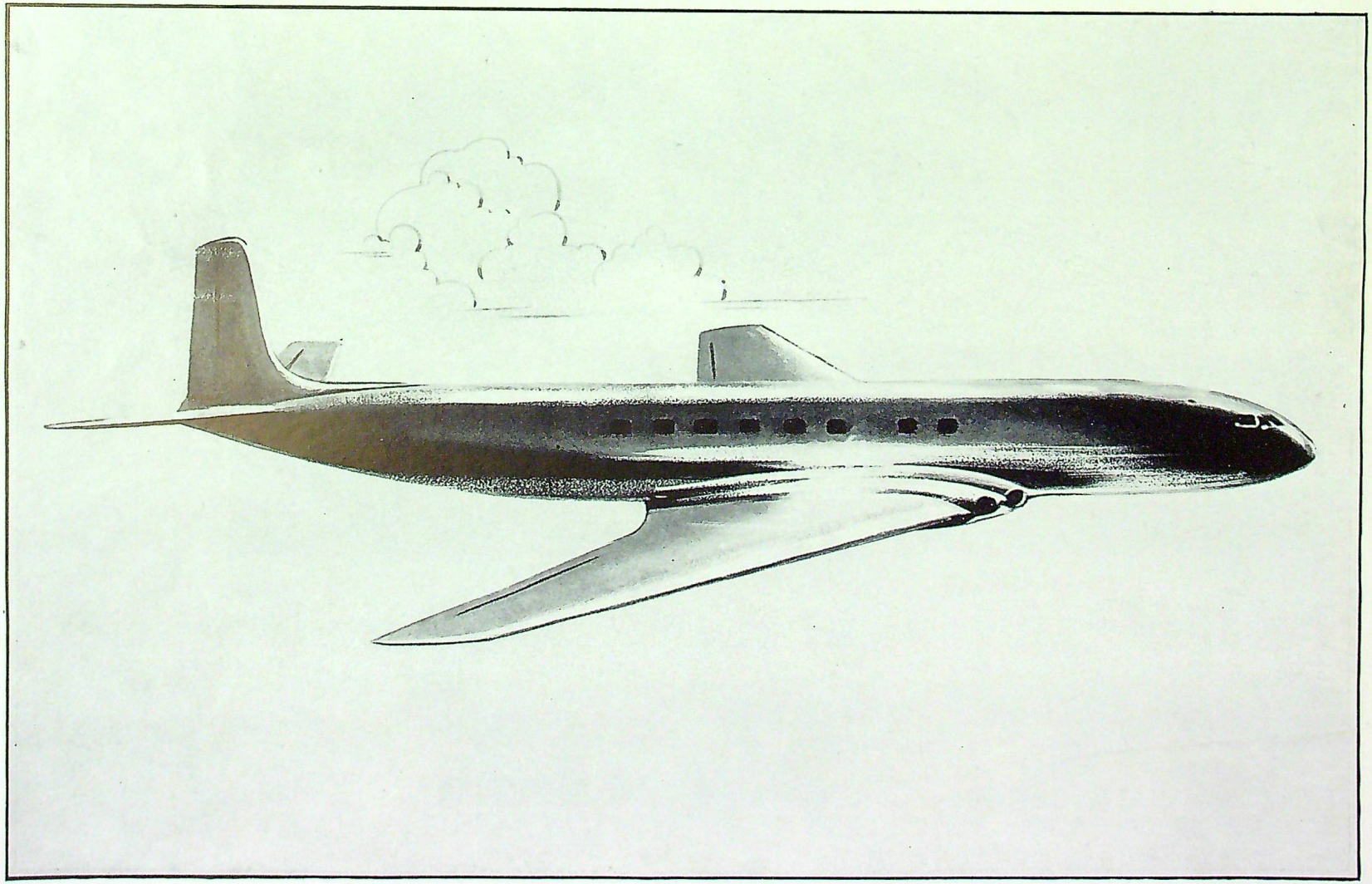
In conclusion, although I myself and indeed all R.A.F. personnel would have bowed to authority and asked at Stores for "Badges—Eagle, airmen," to me and indeed to all R.A.F. airmen, it is, has been, and always will be, AN ALBATROSS!

L.A.C. H. PRIDMORE
R.C.A.F. Station, Clinton
(formerly R.A.F.)



"Mum says to tell Leonardo da Vinci that 'is dinner's getting cold."

("Aeronautics")



(*Courtesy of "The Aeroplane"*)

THE DE HAVILLAND "COMET"

BRITAIN'S NEW JET TRANSPORT


The
ROUNDEL