The CROUNDEL

Vol. 6, No. 5
MAY 1954

ROYAL CANADIAN AIR FORCE

The Roundel

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

Vol. 6, No. 5 MAY 1954

* * * CONTENTS * * *

EDITORIAL

ARTICLES

REGULAR FEATURES

MISCELLANY

This Month's Cover

Air Marshal C. R. Slemon, C.B., C.B.E., Chief of the Air Staff and the only original member of the R.C.A.F. still in the Service, was host at the dinner held on April 1st at the Officers' Mess in Ottawa to commemorate the 30th anniversary of the R.C.A.F. Shown from left to right in our photograph are: Air Commodore W. E. Kennedy, A.F.C., Assistant Vice-Chief of the Air Staff; Air Vice-Marshal H. B. Godwin, C.B.E., A.O.C. Air Materiel Command; Hon. R. O. Campney, Associate Minister for National Defence; Air Vice-Marshal F. R. Miller, C.B.E., Vice-Chief of the Air Staff; His Excellency the Rt. Hon. Vincent Massey, Governor-General of Canada; Air Marshal Slemon; the Hon. Brooke Claxton, Minister for National Defence.

EDITORIAL OFFICES:
R.C.A.F., Victoria Island, Ottawa, Ont.

SGT. SHATTERPROOF IS APPREHENSIVE

Sir:

Since that far-off day when Ur Shatterproof of the Chaldees left his thumb-print on the oldest wine-jar known to archaeology, the name of my House has been synonymous with Progress. Nevertheless, the time has come when I must cry "Halt!" and demand that Progress stand and be recognized before I countenance its continued advance. At the risk of being thought subversive, I must take up cudgels for a return to Cops and Robbers or Cowboys and Indians. I cannot feel that the growing popularity of ABC marks a forward step in the intellectual development of our Service youth.

There is no need, Sir, to upset our tea at this point. There is no need to remove our feet from the editorial desk and with trembling fingers to search our directory for the number of the R.C.M.P.'s Special Branch. The old wardog is not (as we no doubt suspect) seeking to discredit the alphabet and thus undermine the ennobling influence of the free world's press. No; he is merely drawing the attention of the R.C.A.F. to a trend that may yet reduce its senior N.C.O.s to a state of infanticidal frenzy.

Once a loyal servant of Her Majesty has been elevated to the purple and invested with all the Sergeant's powers for good or ill, he must expect to be exposed to the hazards of his rank. I recognize this fact; and I do not think that any responsible N.C.O. has ever seriously resented being touched up by an occasional slingshot pellet while taking the air in the vicinity of married quarters. Nor, for the understanding heart, is there any great hardship in serving as a target for the tommy-guns of F.B.I. toddlers or for the arrows of eight-year-old Blackfeet. It is the time-honoured privilege of the young to assault their elders' dignity; and even the B-B gun, provided that it is not loaded with the somewhat lethal dart, offers the zealous N.C.O. nothing more humiliating than a healthy opportunity of keeping his faculties alert. But, Sir, when we are called upon to contend with ABC, the matter assumes a different aspect.

It would be profitless to petition the Director of Air Force Security to form a posse to ascertain what playful youngster first dreamed up the game of Atomic-Biological-Chemical Warfare. Though L.A.C. Bladder detects the hand of the Kremlin, I for my part look no further than science fiction and the "comics." Whatever its origin, however, I suggest that the game be nipped in the bud. While I appreciate its possible training-value for the potential airmen of the future — and while I freely admit that the untaught instinct of an innocent child might well discover hitherto-unthought-of uses for our atoms, germs, and poisons — I still feel that the survival of our senior N.C.O.s should not be entirely overlooked.

A note, found pinned to the door of the Mess one evening after work, was our first intimation of the coming reign of terror:

"*We have planted a bomb full of dedly backteria where no one will find it. If this mess is not evaculated at once, we will not answer for the consiquencies.*— (*Sined*) *The Mad Sientist.*"

Needless to say, Sir, no Canadian N.C.O. is to be intimidated quite so easily as that. With a gay laugh and a mild quip about "kids being kids," we entered and proceeded to invite our souls in the usual way. Two nights later, however, the Mess was empty. Not even W.O.1 Gallstone could endure the odour that permeated the place. Nor did the pre-prandials resume their customary flow until one of our fire-fighters, equipped with his

respirator, had tracked the mephitis to its source and removed a rabbit from its posthumous hutch in an apparently unopened beer-carton behind the bar.

The Mad Sientist's next major move was less carefully planned but equally effective. As I made my way past the guard-house one Sunday evening, on my way to dine with my old friend Farmer Fetlock, I received a gentle blow on the back of the neck. It had, I found, been caused by a small bag of tissue paper which had burst on impact, releasing a quantity of whitish powder. Seeing no likely marksman at hand, I continued on my course with an indulgent smile . . . only to discover, half an hour later (and in the shrinking presence of Miss Clasper), that I had been subjected to a dastardly attack with itching-powder. The next morning I received a note in the mail:

"Your time is up, Tirant. Sience knows no cure for radioactive dust.— (Sined) The Mad Sientist."

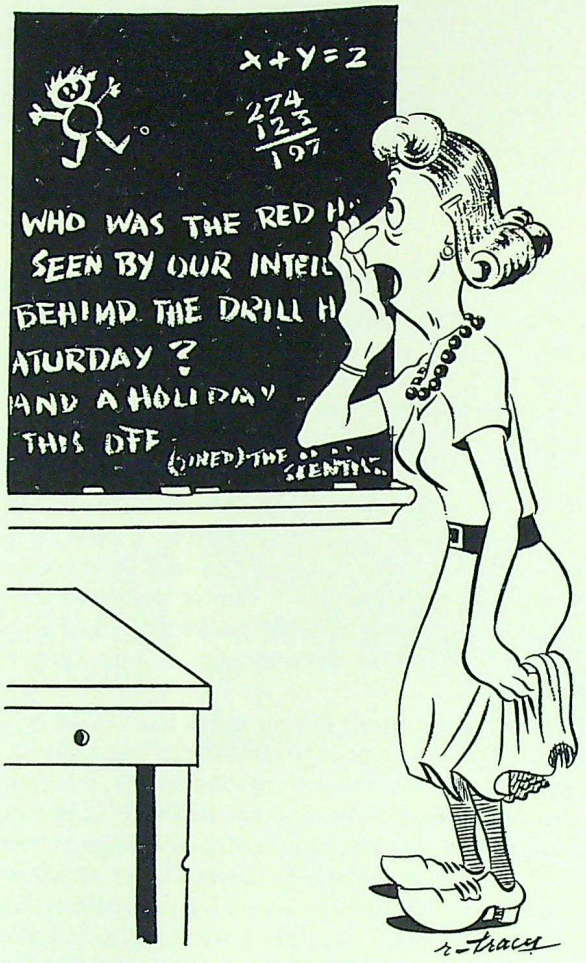
I will not weary you with a recital of all the outrages perpetrated against myself and my colleagues, but the most recent of them is worthy of mention as being indicative of the gathering momentum of ABC. Purely chemical in character, it took place in the station school.

Miss Hooter, upon entering her classroom yesterday morning, was appalled to observe written on the blackboard:

"Who was the red hared flight sarjeant seen by our Intelligents kissing Miss Hooter behind the drill hall at the danse last Satturday? We demand a holliday or the truth. Do not wipe this off.—(Sined) The Mad Sientist."

Not unnaturally, Miss Hooter made a dive for the duster and erased the scandalous words immediately. Within a matter of seconds the classroom was uninhabitable. Subsequent research revealed that three particularly nauseous "stink-bombs" had been cunningly concealed in the duster.

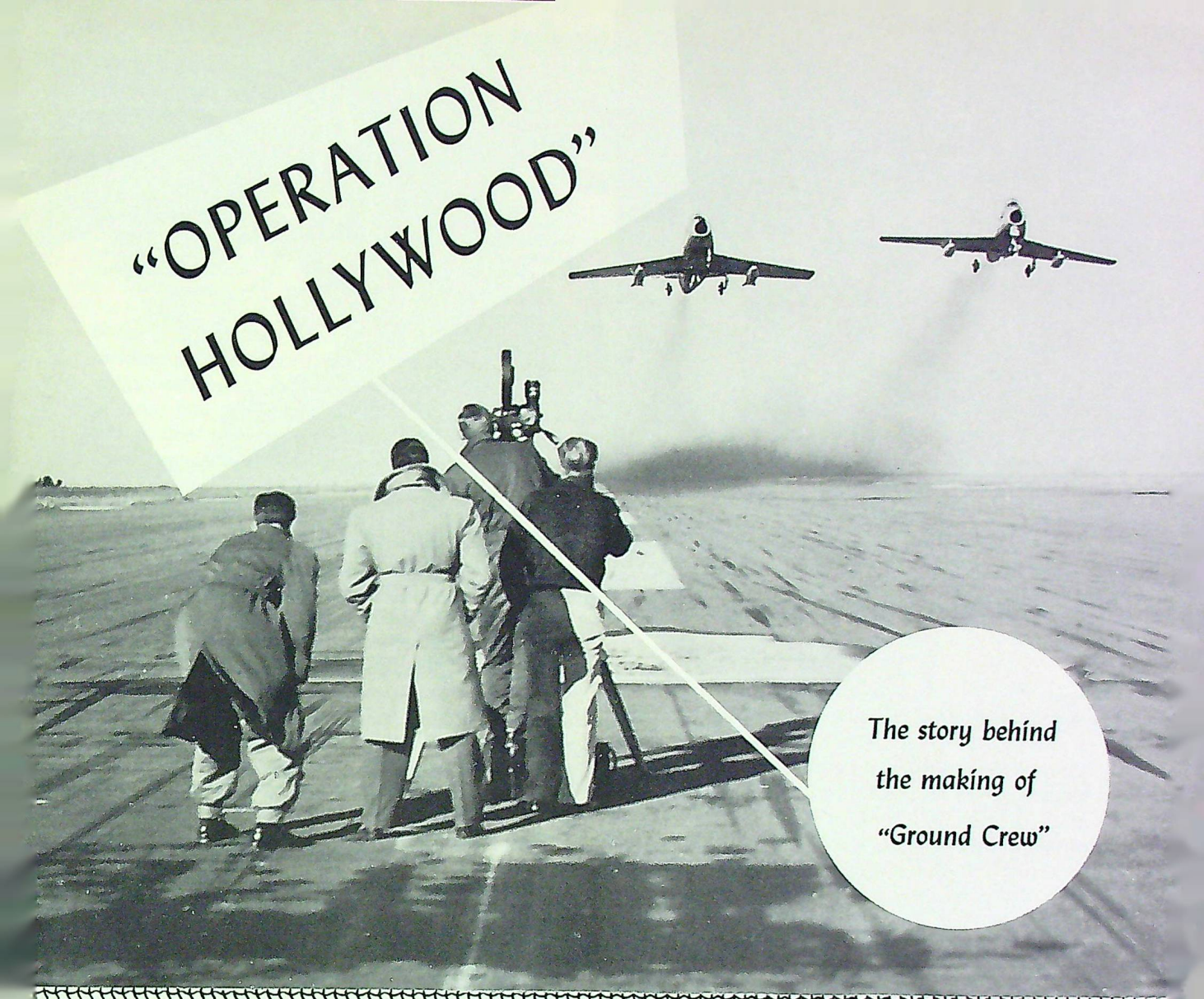
Such, Sir, is the cross we now have to bear. We cannot, I suppose, altogether blame the children; but I understand none the less that Sgt. Tetanus, our laboratory technician, is doing his best to develop a super-virus that will afflict every child



on the station with a roaring dose of mumps. Quarantined, they will be impotent. I trust that the plan will work; but I confess that I am apprehensive lest it merely give them leisure in which to plan an even more inhuman campaign.

Who knows but what our next tormentor may be a Sane Scientist?

"OPERATION HOLLYWOOD"



The story behind the making of "Ground Crew"

By T. E. Farley

During the past few months we have reprinted several of the poems written by Mr. Farley during his service as a flying instructor in the R.C.A.F. during the war. After the war, he joined the National Film Board, for which, last year, he wrote and directed the R.C.A.F.'s first major documentary film, "Ground Crew". Designed both for recruiting and indoctrination purposes, it is an inspiring piece of work, and has been entered in the Canadian Film Awards competition. Copies of it, on 16 mm. film, can be obtained by accredited organizations, either Service or civilian, by writing to the nearest R.C.A.F. Command or Group headquarters or to the Joint Services Training Film Bureau, Victoria Island, Ottawa, Ontario. The film's reference number is 14C2547.—EDITOR).

Top row (l. to r.): Cpl. B. Hopkins, L.A.C. E. Lefebvre, L.A.W. P. Muir, A.C.2 F. Barton, Sgt. J. Hurdle, Cpl. D. Biddle, A.C.1 C. Wran. Bottom row (l. to r.): J. Foster, cameraman; T. E. Farley; G. Barnhill, location business manager; D. Bradley, "grips"; D. McKay, assistant cameraman.

THE smiling gentlemen (and one lady) at the top of this page aren't just having their pictures taken. They're celebrating an important "first" in the history of the R.C.A.F. Their happy expressions mark the end of a long, arduous, and sometimes surprising assignment.

"Ground Crew" is the first in a series of training films to be made as an N.F.B.-R.C.A.F. combined operation. The film-makers are members of the National Film Board. The cast, which at times numbered in the hundreds, is entirely Air Force. The film, a thirty-eight-minute story, shot on standard 35mm. black and white stock, will be shown in 16mm. versions to Air Cadets and potential recruits across Canada, and to incoming airmen and airwomen at No. 2 Manning Depot, St. Jean, Quebec.

The seven "characters" in uniform, shown in the above photograph, were chosen from nearly three hundred airmen and airwomen interviewed and tested on five R.C.A.F. stations, and assigned the leading rôles covering the seven ground-crew trades shown in the film . . . a job which, at the outset, they jokingly labelled "Operation Hollywood."

They soon found, however, that making a four-reel documentary film is no joke.

For one thing, none of the cast had ever acted before. They were chosen simply as "representative types" (though each had to be thoroughly qualified in the trade he portrayed) and most of them were nervous about how they'd look on the screen. As it turned out, once work began, there wasn't time to worry.

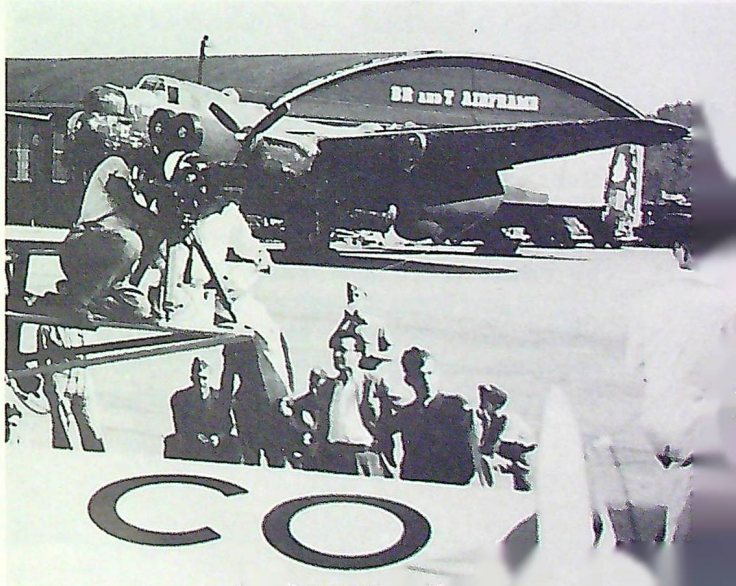
First, there were scripts to be studied, lines to be learned, and characterization problems to be worked out with the director. In a "documentary", unlike the Hollywood "feature", lines are not rigidly fixed. If the scripted dialogue doesn't strike the actor as being "natural", he gets together with the director and the lines are changed, within the story's limits, until he feels that they are right for him. In this way, the actor puts a lot more of his own character into the finished film. But it's no pushover.

Cpl. Bruce Hopkins, who was a pilot during the war, has since graduated from No. 1 Air Radio Officers' School and is now a Flying Officer.

While Frank Barton ponders his lines in the intake of a jet, Mr. Farley explains the scene's action to Group Captain J. D. Syme, M.B.E., Commanding Officer of R.C.A.F. Station Camp Borden.

Set calls were for 0800. Leading members of the cast missed work parades . . . but not the work. While rehearsals kept one or two of them busy, the rest familiarized themselves with film-making by helping cameramen and "grips" to shift lights, haul equipment into place, and "build the set" for the intended scene. Then the shooting began. Unlike a stage play, where there are months of rehearsals before a performance is given, film rehearsals are restricted to a half-dozen or so dummy runs on the set. Then comes the "take". If a piece of action is wrong, or a line is "fluffed", it has to be done over until it's right. And with thirty or forty people in front of the camera at one time, that can sometimes be complicated and exhausting. Said one member of the cast: "On this job, 'Per Ardua Ad Astra' means 'It's tough to be a star!'"

For a busy seven-week period on flight lines and in hangars of five R.C.A.F. stations, shouts of "Lights! Action! Camera!" mingled with maintenance noises and the roar of aircraft engines. The working day was from 0800 until the cameras



Filming a "trouble-shooting" sequence on the flight-line at Borden.

Cpl. D. Biddle, Comm. Tech. (Air) instructor.

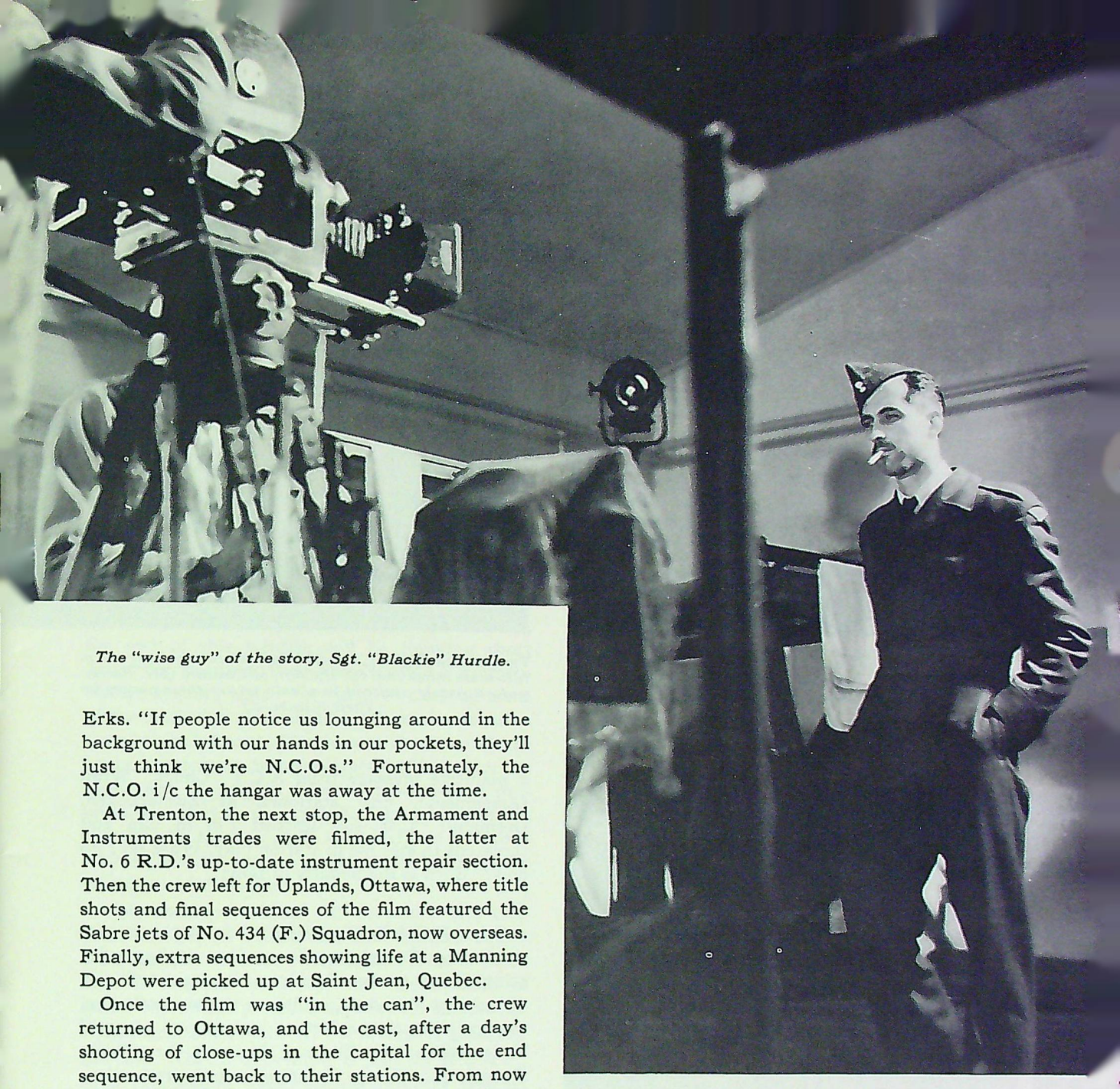
stopped rolling, which was sometimes 2200, and occasionally included Saturdays and Sundays. If the schedule got behind, lunch consisted of sandwiches and cokes "on the set", with the stars learning lines and moving equipment between bites. For a movie set, it was remarkably devoid of prima-donnas. On rainy days, they simply moved indoors, working in a hangar flooded with the eye-stinging brightness of motion-picture "arcs".

It was a job that called for a certain amount of ingenuity as well. At Camp Borden, where the filming began, the film crew needed a crane which would swing their camera in a twenty-foot horizontal arc while lifting both it and two men a dozen feet above the ground. In a matter of days, "Works and Bricks" had manufactured the crane from the N.F.B. cameraman's rough sketches. When A.C.1 Frank Barton, of Centralia, was needed earlier than expected, he was on leave at his home in Niagara Falls. A Harvard from Borden flew down through the rain to pick him up. Within three hours he was on the set, playing opposite Group Captain John Syme, Camp Borden's Commanding Officer.

From Camp Borden (where the Engines, Airframes, and Electrical trades were shot), the cast, crew, and equipment moved to Clinton, and the process was repeated for the Communications trade. Here the film took on a romantic interest, as the story moved in on an attractive Fighter Control Operator (Patricia Muir) and her meeting with a Comm. Tech. Air (played by Cpl. David Biddle). By this time the cast were finding their chores almost routine. But it was too good to last. They were suddenly bumped out of the routine by a camera switchbox catching fire during a sequence in the operations room. Fortunately, it was quickly extinguished, repairs were made on the spot, and the cameras rolled again.

There were moments of amusement behind the scenes as well. In one sequence, shooting into a hangar from the outside, a group of airmen in the shadows inside went unnoticed until the shot was completed. At this point, the harrassed director asked the men what they meant by standing around in front of the camera with their hands in their pockets. "Don't worry, sir," replied one of the

L.A.W. Patricia Muir, "Ground Crew's" romantic lead.



The "wise guy" of the story, Sgt. "Blackie" Hurdle.

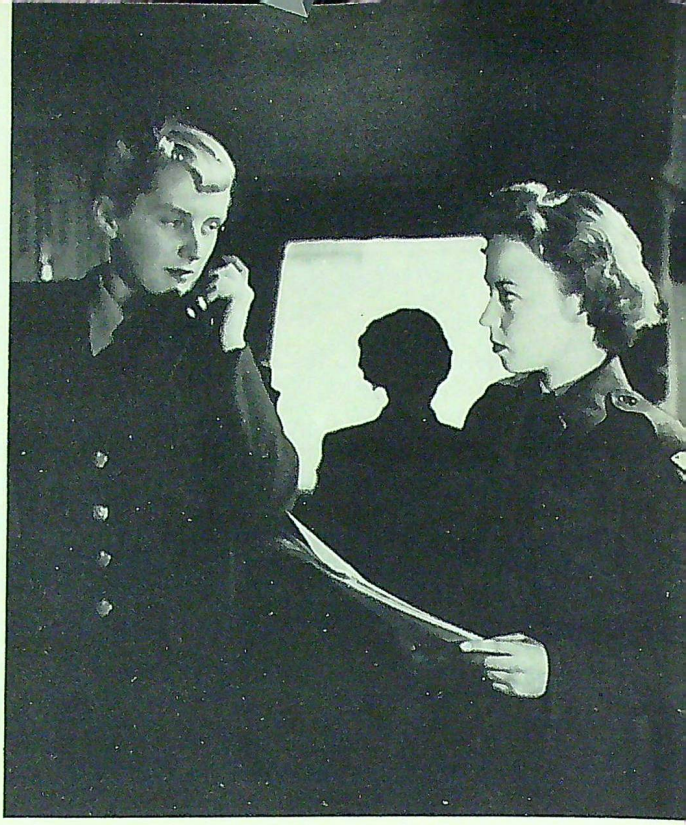
Erks. "If people notice us lounging around in the background with our hands in our pockets, they'll just think we're N.C.O.s." Fortunately, the N.C.O. i/c the hangar was away at the time.

At Trenton, the next stop, the Armament and Instruments trades were filmed, the latter at No. 6 R.D.'s up-to-date instrument repair section. Then the crew left for Uplands, Ottawa, where title shots and final sequences of the film featured the Sabre jets of No. 434 (F.) Squadron, now overseas. Finally, extra sequences showing life at a Manning Depot were picked up at Saint Jean, Quebec.

Once the film was "in the can", the crew returned to Ottawa, and the cast, after a day's shooting of close-ups in the capital for the end sequence, went back to their stations. From now on the film would be in the hands of the editors, writers, musicians, and sound-mixers, who would bring it to completion. Meanwhile, the wheels of the R.C.A.F. ground on.

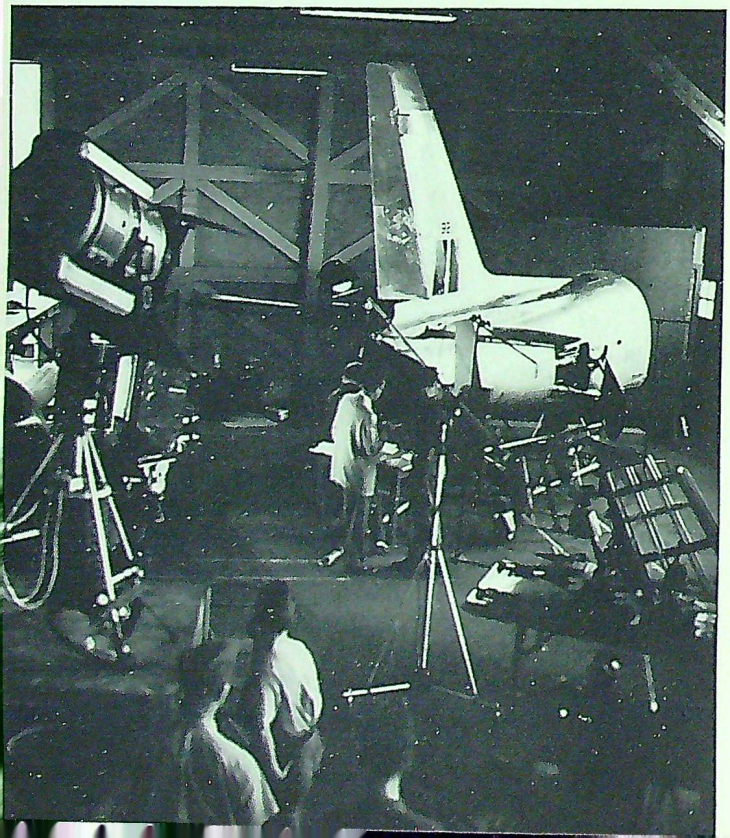
By the time "Ground Crew" was finished, the status of several of the cast had changed, and some of them were too far away to attend the *première*. Sgt. John ("Blackie") Hurdle (Engines), had been posted from Camp Borden to Saint Hubert, Quebec. Cpl. Biddle (Communications) of Clinton, was reported engaged; and L.A.C. Ted Lefebvre (Electrical) had moved from Centralia, honeymooned out west, and was stationed at Portage La Prairie. At Ottawa, the writer received

Barracks "set" at R.C.A.F. Station St. Johns, P.Q. "Chuck" Wran prepares to sound off about the R.C.A.F.'s slowness in getting him on course.



Two of the Fighter Control Operators who put on a full-scale mock raid for the film at Clinton. (Mr. Farley unfortunately omitted to obtain either their names or their numbers.)

In a Borden hangar.



a plaintive message from A.C.1 "Chuck" Wran (Armament), now stationed at Zweibrücken, Germany: "C.O. has learned I'm in film and threatens to star me in station play. What do I do now?" Such is the penalty of fame!

* * *

Other R.C.A.F. films are already on the way.

"Paying Compliments", a film dealing with saluting and modes of address, is completed; and "You're on Parade!", a film on the airman's dual responsibility to the Service and to civil life, will be issued shortly. Training films on the "Radio Range" and "Radio Compass" are in production, and several others have been scripted.

As one senior officer at Training Command remarked: "For years we have used American and British training films, and, excellent as they are, they can never be 100% effective for Canadian airmen. It is a stirring thing to realize that we in Canada are able to produce training films that needn't take a back seat to films anywhere."

THE PARTY LINE

TELECOMMUNICATIONS IN THE R.C.A.F.: PART THREE

By Wing Commander D. Gooderham, O.B.E.

NUTS AND BOLTS

THIS IS NOT to be a technical dissertation on telecom gear currently in use in the R.C.A.F. At the end of this treatise will be found a short Appendix describing the Army-Navy (AN) nomenclature system, which may help to clear up some of the confusion generated by telecom's extensive use of alphabet soup. The present chapter seeks to bring out certain technical factors that have an important bearing on telecom procurement programmes. Herein, too, may be found some of the reasons why telecom staffs are usually in disfavour with either the users of telecom facilities or the guardians of the public purse.

New developments in the electronic field continue to come at such a rate that telecom equipment usually becomes obsolescent before it wears out. This is not to imply that development of better equipment precedes the need for that better equipment: unfortunately, the reverse is generally the case. What it does imply is that the R.C.A.F., as a progressive force, seldom replaces telecom equipment with more of the same type. Nearly all major telecom equipment being procured for the R.C.A.F. is different enough from that previously in use to give perpetual indigestion to the logistic support organization and to place a constant load on the agencies charged with training telecom users and maintainers.

The R.C.A.F. is primarily a user, not a development, agency. Accordingly, its activities in the field of telecom development are those of monitoring all current developments of interest and of initiating such additional development projects as are necessary to design equipment suited to R.C.A.F. needs. The actual development work is usually carried out by contract with civilian firms. All of this is done in the closest collaboration with other armed services and with the Defence Research Board. The monitoring of "R.C.A.F." telecom developments must be close and continuous. Development is a continuous process, and any design engineer, given the time, can always better his last product. The Service, as an agency needing equipment, must freeze design and insist on production-prototyping in sufficient time to enable manufacture and installation by some programmed date. Furthermore, the requirements specified are usually a goal at which to aim; time and events frequently dictate that some less difficult target be set. Decisions on compromise occur repeatedly during development and, unless sound advice on operational implications is available, much time and effort may be wasted. Finally, quantity procurement must be programmed and financed. All of these factors necessitate that the monitoring be done by men who are not only highly qualified technically but who are well versed in the requirements of the Service — in short, serving officers.

Telecom engineering and procurement staffs are constantly faced with two conflicting desires: (a) to accept equipment built to specifications lending themselves to easy manufacture and early delivery dates, and (b) to insist, even at the expense of later delivery and higher cost, on specifications which experience has proven to be necessary if the product is to be reliable. An impressive volume of data has been assembled, by various groups, which lends support to the stiffer specification approach. Surveys taking cognizance of the personnel, housing, and administrative costs incidental to maintenance, as well as of the more obvious costs of spare parts and test equipment, have shown that the effort of maintaining telecom equipment in the Second World War cost many times the original price of the equipment. The surveys conclude that the interests of the Services, and of the taxpayer, would be served by paying many times what we now do for original equipment. The trouble is, first to convince all concerned that a very high initial price should be paid, and second, to arrange international affairs so that fitment of our forces can safely be deferred until design and production engineers can produce the superior black box.

Mention should be made of the trials (variously known as service, field, or user) to which new telecom equipment is, or should be, subjected. These are primarily designed to "prove" the specifications under field conditions. It occasionally happens that such trials also unearth some design or production defect not uncovered by inspections performed by the manufacturer or by D.N.D. Inspection Services. Under conditions of Service expansion or re-equipping, a multitude of excellent reasons can always be brought up to show how safe it is to go into quantity production without putting production line equipments through a field trial. The archives record many instances where such action was taken, based on equally excellent grounds. They also record a sad story of delayed introduction, numerous failures in service, and of expensive repair or modification programmes. There are those who would seek to refute predictions based on past experience by pointing out the improved knowledge and ability of the electronic industry and of our procurement agencies. These factors are acknowledged — with appreciation; but it must not be overlooked that the problems have increased in complexity in like degree. To sum up: time-consuming trials are usually essential to placing a reliable telecom facility in the hands of the user at the earliest possible date.

Most Service people realize that the cost of the equipment actually used by the operators is not the total cost of introducing that equipment into Service use, but few people realize the magnitude of the less obvious costs. Introduction of a new telecom equipment usually involves several, and sometimes all, of the following: test instruments, spare parts, extra sets to use while others are being repaired, transit cases, maintenance manuals, parts catalogues, operators' manuals, special training equipment for operators, and ancillary equipment (such as antennae, masts, remote controls, cabling, auxiliary power units). Invariably there is an installation or fitment cost: construction engineering and electronic installation costs for ground equipment, and airframe modification and electronic fitment for airborne equipment. Finally, the new equipment may be so complex that both operators and maintenance men must be given special courses. In total, these items will cost a sum seldom less than half that of the black boxes actually "called-up" by the operators. Not infrequently, they may cost several times as much.

The foregoing paragraphs treat of the dollar costs inherent in the nuts-and-bolts aspects of telecom. This may be a suitable place in which to sound a warning to those who seek to mechanize as an "obvious" economy measure. Such people are prone to support introduction of equipment which will eliminate manpower of the "operating" variety. The savings are held to be "obvious" and the new equipment will "pay for itself in a few years." They overlook the manpower required to maintain the new equipment — manpower both at the user unit and all the way back through the logistic support organization. The "obvious" economy can prove to be very expensive indeed.

The Service must also strive for a nice balance

between doing telecom work itself and having it done by industry under contract. A related problem is the engaging of civilians in lieu of uniformed personnel. It is obviously in the interests of the R.C.A.F. to have, in Canada, an electronic industry capable of installing and maintaining R.C.A.F. telecom equipment. Again, few will dispute that a local increase of efficiency can be obtained by using civilians in positions where continuity of employment is markedly advantageous. But both these procedures must be used with care lest the Service be found lacking in time of war, when installation and all echelons of telecom maintenance must often be done solely by Servicemen working with experience and skills acquired in peace-time. Some peace-time "economies" can be defended by showing that any resulting deficiencies can be made good in war merely by heavy spending; but such arguments cannot be applied effectively to the case in point, since experience cannot be bought with money.

We have attempted to show that telecommunications engineering is not a function which can be accomplished by a group of electronic engineers working in little back rooms. Telecom engineering staffs must, at all times, take due regard to the economic implications of their proposed course of action — dollars, manpower, industrial capacity and potential. No decision they make is good unless it caters to the operational requirements of the Air Force — a matter which often involves a weighing of short- and long-term considerations. The requirement is highly complex and constantly changing; and, if it is to be met, telecom staffs must actively participate in the shaping of Air Force policy and programmes.

MOBILITY AND FLEXIBILITY

It has been said that the mobility of an armed force can never be greater than the range of thought of its commander. Certainly, mobility of a force is not governed solely by the nature of the equipment at hand but is dependent on the ingenuity of the men who actually use the equipment. This factor is hard to measure, which may explain the tendency, sometimes encountered, to act as if it did not exist.

Those in charge of telecom development and procurement programmes must seek to steer a course midway between that advocated by those who favour a static concept and that favoured by those who seek mobility but who credit the eventual users with no initiative. The former course will not do: it is dangerous for a heavy-weight and suicide for a light-weight. The latter course is better, but must be avoided as one wasteful of time, effort, and money. To attempt to foresee *every* eventuality, and to incorporate appropriate features in the mobile telecom facility being designed, is to embark on a curve of diminishing returns. The truth of this statement should be evident to anyone who has wondered why the plan he made six months ago seemed so perfect at the time. Apply this thought to telecom equipment, which requires many months to get from plan to actuality, and you will probably decide (as has the writer) that the best course is to design and produce equipment that is only inherently flexible. In other words, it need not necessarily be capable of meeting every possible contingency, but should be of a form lending itself to changes as required.

Inherent flexibility, in so far as telecom equipment is concerned, runs mainly to weights and form factors, whether to use "several small ones" or "one big one," whether to insist on all prime movers or to accept trailers, etc. A less obvious point, but of the utmost importance in war, is serviceability and ease of maintenance. Arising from this is the need for standardization not only of components in the various equipments in any one force, but between allied forces. True mobility cannot be achieved unless one's equipment is both operationally and logistically compatible with that used by the allies with whom you work.

Those who seek to guide the telecom ship along the middle course of inherent mobility should take heed of a strong rip-tide setting towards the rock of the static concept. The name of this rip-tide is Dollar Economy. Telecom equipment which is suited only for static rôles can be bought much more cheaply than that having inherent flexibility. Any requirement for relatively expensive "mobile" equipments will always need to be supported with conclusive arguments.

Under the last two headings we have attempted to bring out some of the factors that must be considered when drawing up operational and technical specifications for new telecom equipment. It is hoped that we have shown the type of thinking that must go into telecom planning and that we have emphasized the need for the closest co-operation between telecom staffs and operational planning staffs. Telecom staffs must steep themselves in the thinking of the flyers; operational and planning staffs who do not seek to consult telecom and other electronic staffs on all major projects are not only failing in staff work but are acting without regard for the ever-increasing dependence of an air force on electronics.

THE CRYSTAL BALL

Having laboured through a fair amount of hard reality, it is at least refreshing to rub the crystal ball and play the seer. With the reader's forbearance, therefore, I will now indulge in some speculation on future trends in the electronic field and on their possible impact on the Service. What follows is written in the first person in order to stress the fact that the views expressed are my own and in no wise official.

Changes in telecom equipment and practices are brought about either by a need to improve or supplement existing facilities, or by a desire to operate existing facilities at less expense. The rate of change depends on the urgency of the need, on the availability of funds, and on developments in the electronic field.

If no improvements were required, steady progress could be made towards lower operating costs. In, say, ten years, equipment could be obtained which would be far more automatic and more reliable than that now in use, requiring fewer and less skilled operators and technicians. Some may disagree with my figure of ten years: it is purely arbitrary, as the Utopian goal appears unattainable simply because a need for better facilities always exists. My forecast is that sheer economics — the prohibitive cost of logistic support and of abortive missions of aircraft — will soon force us to procure more reliable equipment even at the expense of delaying the availability of improved facilities.

Some help in envisaging the improved telecom facilities of the future can be found by considering the operational tactics that will make them necessary. The most important is the rising speed of aircraft and missiles; another is the rising tempo of cat-and-mouse E.C.M. tactics; a third is a need to improve the accuracy of certain radio warfare facilities; and a fourth is a desire to enhance flying safety by improving radio navigation aids.

Successful air defence tactics have always required quick and accurate transmission of information within the radar and control nets, and of direction from ground controllers to fighter aircraft. As air speeds increase, information and orders must be passed faster. Even before speeds of Mach 1 are reached, trouble is experienced with the human links in the system — the radar-scope readers, the tellers, the controllers, and finally the pilot. The keenest of brains and the nimblest of tongues fall short of the requirement. Various electronic devices must be used to help, if not to replace, the human brain. What electronic black boxes will be used to cope with intercept problems posed by speeds of Mach 1 plus? Voice, as a means of conveying information and orders between ground points and between ground and air, will be supplemented, possibly replaced, by data-transmission systems. Air to ground links will get such systems first, if for no other reason than the greater immunity of such systems to jamming as compared with voice radio. A second device will be the remote display of radar information. Radar scopes at central control centres will display without delay or error everything seen on radar scopes at remote radars; tellers and plotters will be eliminated. Another obvious and readily obtainable facility will be electronic tote-boards for the presentation of the multifarious data required by identification and fighter control officers.

Reserved for special mention are two rather difficult tasks that electrons must tackle. The first is to take over the work of the identification officer, whose task threatens to become greater than can be handled by a human brain. Finally, there will be a need to take over the work of the

intercept controller, to replace him with a computor into which radar and other data are put and out of which will come flight control data for the interceptor.

Turning from the above tasks, none of which connotes a betterment of international relations, it is soothing to look ahead and speculate on what telecom will do for flying safety, both military and civil. There should be a marked improvement in the capacity and accuracy of landing aids such as G.C.A. and I.L.S. Unless some multi-lateral agreement is reached to adopt G.C.A. to the exclusion of I.L.S. (or *vice-versa*), it is likely that both will become automatic systems involving rather more black boxes in aircraft and on the ground than are now used.

Another nav aid almost certain to be available for Service use within ten years is an automatic track-recorder. This device will accept data from radio nav aids and from other navigational instruments and will maintain a constant record of track flown, regardless of manoeuvres. Additionally, it will compute the course that must be flown to get to any desired point. This equipment will contain mechanical as well as electronic components and may or may not be classified as telecom gear.

The introduction of some of the above equipments and systems will require greater numbers of telecom personnel but need have little effect on R.C.A.F. organization. Others may have rather far-reaching effects. Coincident with the introduction of missiles, both for offence and defence, a need will arise for closer integration of telecom with the electronic aspect of armament. Change will be gradual, I think, and this is just as well, as it will not be easy to find men capable of handling the ensuing jobs.

Control of the weapons of the future Air Force — particularly the air defence weapons — will require a new type of officer. The electron will be all-pervasive, and the use of weapons will require a large body of highly skilled electronic engineers and technicians. Yet electronic knowledge alone will no more fit a man to control and use the weapons system than will a massive knowledge of aerodynamics or experience in flying aircraft. What the necessary man will be called, I do not know; but I see him as simply (?) a good intellect which has been first steeped in the many aspects of the rôle to be played by our weapons systems, and then subjected to the technical mysteries of telecom, aerodynamics, armament, and "flying." It may be that time — measured by the speed of technological development — will not permit the inclusion in the careers of these officers of such tasks as adjutant, personnel administration, etc. This would be unfortunate, but probably no worse than the particularly large type of ulcers to which such officers will no doubt be subject. This rather gloomy facet of the crystal ball's interior could be brightened, I feel, if a start were made now to select and train tomorrow's "few."

There are indeed many things to be seen in the crystal ball which bespeak the future glories of Telecommunications. There is but one frightening prospect: that some one will give the art an even longer name.

End

APPENDIX
THE "AN" NOMENCLATURE SYSTEM

Telecom equipments now in use by the R.C.A.F. are identified by groups of letters and numbers allocated under one of three nomenclature systems:

- The manufacturers' system.
- The "AF" system.
- The "AN" system.

Nomenclatures applied by manufacturers seldom give any clues as to the nature or purpose of the equipment. R.C.A.F. policy is, therefore, to replace type numbers of this sort with nomenclature derived from the AN system. Exceptions are equipments which are going out of service, e.g., the AT3 radio transmitter, and items having limited distribution. For all practical purposes, manufacturers' nomenclatures will soon cease to exist; and it therefore appears unnecessary to list them in this appendix.

The AF nomenclature, now only used for obsolescent equipment, is peculiarly R.C.A.F. The

quantity of equipment bearing AF nomenclatures is insufficient to justify inclusion here of a key to the system.

The AN nomenclature system, originally conceived and adopted by the U.S. Army and Navy, has now been adopted by the three U.S. Services and by the Canadian Services. A publication called JANAP 196 gives complete information on the system. This appendix will describe only the more generally used features.

The AN nomenclature of a major item of equipment consists of the letters AN followed by an oblique stroke (AN/), a group of three letters, and a number.

The first of the three letters indicates the type of installation — airborne (A), ground (G), portable (P), surface water-craft (S), etc.

The second letter indicates the type of equipment — radar (P), radio (R), etc.

The third letter indicates the purpose of the equipment — communications (C), navigation aid (N), receiving (R), transmitting (T), etc.

The number following the three letters serves to distinguish between various models of similar equipment.

A table giving the meaning of all indicator letters is given with this appendix. To illustrate their use, here are a few examples incorporating those letters most commonly found in equipment used by the R.C.A.F.

A<u>R</u>C 3 — an *Airborne* Radio equipment used for Communications.

G<u>R</u>C 27 — a *Ground* Radio equipment used for Communications.

A<u>P</u>N 4 — an Airborne *Radar* equipment used for Nav Aid purposes.

A<u>R</u>N 6 — an Airborne *Radio* equipment used for Nav Aid purposes.

AR<u>A</u> 8 — an Airborne Radio *Auxiliary Assembly* (e.g., the ARA 8 is a D.F. adapter kit suitable for application to a V.H.F. transceiver).

GR<u>C</u> 32 — a Ground Radio equipment used for *Communications*.

1st Letter
INSTALLATION

A — Airborne (installed and operated in aircraft).

B — Underwater mobile, submarine.

C — Air transportable (inactivated, do not use).

D — Pilotless carrier.

F — Fixed.

G — Ground, general ground use (includes two or more ground installations).

K — Amphibious.

M — Ground, mobile (installed as operating unit in a vehicle which has no function other than transporting the equipment).

P — Pack or portable (animal or man).

S — Water surface craft.

T — Ground, transportable.

U — General utility (includes two or more general installation classes, airborne, ship-board, and ground).

V — Ground, vehicular (installed in vehicle designed for functions other than carrying electronic equipment, etc., such as tanks).

CR<u>D</u> 6 — An Air Transportable Radio equipment used for *Direction Finding*.

CP<u>N</u> 4 — an Air Transportable Radar equipment use as a *Nav Aid*.

GR<u>R</u> 7 — a Ground Radio *Receiver*.

GR<u>T</u> 3 — a Ground Radio *Transmitter*.

AP<u>X</u> 6 — an Airborne Radar equipment used for *Identification* purposes.

Note: The middle letter is usually of interest only to technical agencies. The important letters, to most people, are the third and first, in that order.

TABLE OF "AN" INDICATOR LETTERS

2d Letter
TYPE OF EQUIPMENT

A — Invisible light, heat radiation.
B — Pigeon.
C — Carrier (wire).
D — Radiac.
F — Photographic.
G — Telegraph or telotype (wire).
I — Interphone and public address.
K — Telemetering.
L — Countermeasures (inactivated, do not use).
M — Meteorological.
N — Sound in air.
P — Radar.
Q — Sonar and underwater sound.
R — Radio.
S — Special types, magnetic, etc., or combinations of types.
T — Telephone (wire).
V — Visual and visible light.
X — Facsimile or television.

3d Letter
PURPOSE

A — Auxiliary assemblies (not complete operating sets).
B — Bombing.
C — Communications (receiving and transmitting).
D — Direction-finder.
G — Gun- or searchlight-directing.
H — Recording (photographic, meteorological, and sound).
L — Searchlight control (inactivated, use "G").
M — Maintenance and test assemblies (including tools).
N — Navigational aids (including altimeters, beacons, compasses, racons, depth sounding, approach and landing).
P — Reproducing (photographic and sound).
Q — Special, or combination of types.
R — Receiving.
S — Detecting and/or range and bearing.
T — Transmitting.
W — Remote control.
X — Identification and recognition.

The Suggestion Box

The Chief of the Air Staff has written a letter of thanks to the undermentioned officer for an original suggestion which has been officially adopted by the Service.

Flying Officer A. W. S. Preddy, of No. 435 (Transport) Squadron, devised a modification in the mount of the astro-compass used in C119-F aircraft. It entails the use of split-pins to prevent loss of bolts occasioned by vibration.

Flying Officer A. W. S. Preddy.

WEST POINT WEEK-END

By Flight Lieutenant J. D. Harvey, Directorate of Public Relations

THE 23rd game of the only international sporting competition engaged in by Canada's military forces, the annual hockey game between West Point and the Royal Military College, took place on March 6th. Played alternately at Kingston and at the United States Military Academy, the famed hockey rivalry has been going on since 1923, except for breaks during the Second World War.

The game was played this year at Kingston, and, like the World Hockey Championship which overshadowed it, it resulted in Canada's losing at her National sport by a score of 5-3.

Although R.M.C. has the edge in games, having won 16 out of 23, with one game tied, it is significant that West Point has won 4 of the six games since the series resumed in 1949.

The game this year featured one unusual event: a penalty. In the previous 22 games a penalty had never been awarded to either side. This strange custom, peculiar in present-day hockey, was the result of the tremendous advantage R.M.C. had in the early years. Fifteen straight victories by R.M.C. tells a tale in itself. The Canadians had natural ice and the recruits were hockey-minded. At West Point, however, the weather was too warm for good ice and most of the students didn't know one end of a hockey stick from another. Though the scores were often close, U.S.M.A. did no better than secure one tied game before building its own artificial ice arena in 1937. The next year it lost a close match, 1-0, and in 1939 West Point won its first game. Since the war, each team had won its home games up until this year.

The early advantage of the Canadians led to this strange penalty arrangement — a sort of "after-you-Alphonse" attitude. Since West Point has now obviously figured out which end of the stick to use, the last few years have strained the patience of the referees to the limit. Charging, boarding, and tripping, etc., resulted in a whistle and face-off at the scene of the crime.

Church parade. Left to right: Canada's Defence Minister Brooke Claxton; Mr. R. D. Stuart, U.S. Ambassador to Canada (taking the salute at the march-past); Brigadier D. R. Agnew, Commandant of R.M.C.; Brigadier-General J. H. Michaelis, Commandant of West Point; Senior Cadet A. Marshall, of R.M.C.

The heated struggle this year, with both teams fairly evenly matched and both "up for the game," soon made it clear that something should be done to cut down the rough play. It took until five minutes of the third period, however, before the officials huddled and decided to start calling penalties. At the 10-minute mark in the last period, West Point's goalie was called for interference and given a two-minute penalty. With the precedent set, the officials had no more worries over infractions, and the game settled into a fast, clean exhibition.

It was interesting to watch the American team in action, especially for anyone who held the biased opinion that Canadians are just naturally better than anyone else at hockey. Most of the Pointers were from towns in the northern states which have a climate similar to Canada's, but they did have one player from Buenos Aires, Argentina. Exceptionally strong skaters, they all stood over 5 ft. 9 in. and out-weighed R.M.C. considerably. Although R.M.C. had faster players, they couldn't get through the air-tight defence West Point threw up. By playing a waiting game, the Americans used their good defense to break up the R.M.C. rushes and picked their breaks at will.

As could be expected with the Cadets, all were in excellent physical condition and they kept up a whirlwind pace throughout the entire game. In commercial competition the teams would perhaps be classed in the Junior B leagues.

West Point won not only the hockey game but the debating competition and a .22 pistol shoot for a complete sweep of the week-end's activity. The pistol shoot proved easy pickings for the Pointers: they rolled up 1365 points out of a possible 1500. An R.C.M.P. team from Ottawa also engaged in this shoot, and it came out second best with 1307. R.M.C. finished last with 1216 points. In fairness to all, however, it must be emphasized that R.M.C. was using standard .38 revolvers cut down to .22 size, while both the West Pointers and the R.C.M.P. had special .22 target pistols.

The two team captains pose with the trophy after the game. (Left) West Point's Victor Hugo and (right) R.M.C.'s Jerry Donahue.

The debate, with R.M.C. taking the affirmative stand, featured some spirited rostrum-pounding by both sides on the issue, "resolved that a free-trade customs union should be established between the United States and Canada".

In all, the week-end provided a wonderful opportunity for both military institutions to meet each other, which was the original idea when the series began. General of the Army, Douglas A. MacArthur, when he was Superintendent of West Point in 1923, and Lieutenant-General Sir Archibald MacDonnell, then Commandant of R.M.C., were the instigators. They considered that the officer cadets of the two national military colleges would profit by such association and that the friendly rivalry of an annual hockey game would provide a suitable occasion.

The cadets seemed to feel exactly that way — although R.M.C. *would* have liked three extra goals.

Pin-Points in the Past

Reprinted here are two extracts from the first orders issued by the Canadian Air Force. The C.A.F., which had been authorized by Order-in-Council on 18 February 1920, was the military branch of the Air Board. It consisted then merely of a Headquarters in Ottawa and No. 1 Wing (with its school of Special Flying) at Camp Borden. The only flying carried out by the C.A.F. was refresher training (one month every other year) for officers and airmen who had served with the Royal Flying Corps, the Royal Naval Air Service, or the Royal Air Force, during the First World War. Flying operations (photographic survey, forestry patrols, etc.) were undertaken by the civil branches of the Air Board.

The cap-badge and wings of the C.A.F.

CANADIAN AIR FORCE Serial No. 1.
WEEKLY ORDERS issued by
Air Commodore A. K. Tylee, O.B.E.,
Commanding Canadian Air Force.

September 13, 1920

APPOINTMENTS.

The following provisional appointments to commissioned ranks are made (with seniority to be hereafter determined). Commissioned rank as shown:

Air Commodore	Tylee, Arthur Kellam
Wing Commander	Redpath, Ronald Francis
Wing Commander	Joy, Douglas Graham
Wing Commander	Scott, James Stanley
Squadron Leader	Pinder, Frank George
Squadron Leader	Scott-Williams, John
Flight Lieutenant	Brown, Allan Roy
Flight Lieutenant	Blackmore, George John
Flight Lieutenant	Towneley, Philip Ford
Flight Lieutenant	Bethune, Henry Norman
Flight Lieutenant	Miller, Winfield
Flight Lieutenant	Fairweather, Charles Duncan
Flight Lieutenant	Watson, McClelland Barry
Flight Lieutenant	Berry, Oscar
Flight Lieutenant	Falkenberg, Carl Frederick
Flight Lieutenant	Cuffe, Abraham Lawson
Flight Lieutenant	Thompson, George Anson
Flight Lieutenant	Anderson, Norman Russell
Flying Officer	Conn, Kenneth Burns
Flying Officer	Dogherty, Frank William
Pilot Officer	Pritchard, Frederick Alfred

COMMAND

Canadian Air Force.

The undermentioned officer assumed command of the Canadian Air Force with effect from 17/5/20.

Air Commodore A. K. Tylee.

No. 1 Wing Camp Borden.

The undermentioned officer assumed command of No. 1 Wing, Camp Borden, with effect from 7/9/20.

Wing Commander R. F. Redpath.

School of Special Flying, No. 1 Wing.

The undermentioned officer assumed command of the School of Special Flying, with effect from 7/9/20.

Squadron Leader J. Scott-Williams.

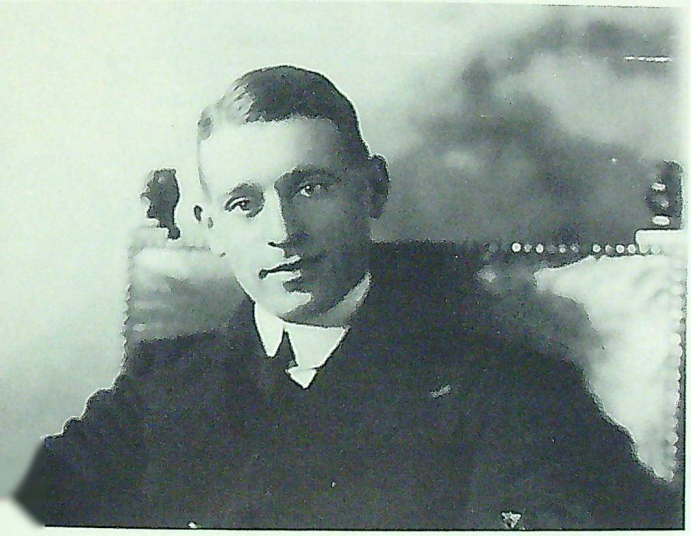
Wing Commander Redpath succeeded Air Cdre. Tylee as Director on 22 March 1921, and was in town succeeded by Wing Cdr. Scott on 13 July of the same year. Flt. Lt. Cuffe became Director of the R.C.A.F. on 30 April 1932.

Two of the officers named in the foregoing orders remained continuously in the Service until the Second World War: Flt. Lt. Cuffe and Flt. Lt. Anderson. Both retired as Air Vice-Marshals — the former in 1944, the latter in 1948.

Of the remainder, four rejoined the Air Force at the outbreak of the war: Wing Cdr. Scott, Sqn.

Air Cdre. A. K. Tylee, O.B.E.

Wing Cdr. J. S. Scott, M.C., A.F.C.



Squadron Commander R. F. Redpath, R.N.: 1918.

Air Vice-Marshal A. A. L. Cuffe.

Ldr. Scott-Wiliams, Flt. Lt. Falkenberg, and Flying Officer Conn. Wing Cdr. Scott was released as an Air Commodore in 1945, Sqn. Ldr. Scott-Williams died as a Wing Commander during the war, Flt. Lt. Falkenberg and Flying Officer Conn were released as Group Captains shortly after the cessation of hostilities.

Flt. Lt. Brown was the pilot who shot down Baron von Richthofen in the First World War.

Feminine Gen

A BACKWARD GLANCE

"London, Nov. 12 — Canadian airwomen performed their precision drill on Wellington Barracks broad parade square, worn smooth by generations of Guards regiments, and drew the compliment from the Duchess of Gloucester that 'guardsmen could not have done better'."

This quotation from the Ottawa "Journal" of 13 November 1943 gives "Feminine Gen" its own private Pin-Point in the Past this month.

The occasion was an inspection of Canadian airwomen overseas, on 12 November 1943, by the Duchess of Gloucester, Honorary Chief Commandant of the Women's Auxiliary Air Force of Great Britain, at Wellington Barracks parade square, London. Three squadrons of airwomen took part in the review, which featured a performance by the precision squad.

Highlight of the ceremony was the presentation of a gold cup to the Women's Division by the Duchess on behalf of the W.A.A.F. Wing Officer Kathleen Walker, senior W.D. officer overseas, accepted the gift "as token of the wonderful co-operation we have received from the W.A.A.F."

By that date members of the Women's Division had been overseas for over a year, the first group having arrived in England in the summer of 1942. In all, about 1,700 airwomen and women officers served overseas during the Second World War.

The cup, of solid gold and valued at $2,500, was inscribed: "To the Royal Canadian Air Force

On its arrival in Canada, the cup is examined by Wing Officer Willa Walker (senior W.D. at A.F.H.Q. in 1943), Flight Officer M. Dunbar, and three airwomen.

Women's Division overseas, from the Women's Auxiliary Air Force of the Royal Air Force, in token of comradeship and esteem. Presented by the Air Chief Commandant the Duchess of Gloucester at Wellington Barracks, 12th November 1943."

Encased in a red leather box lined with white satin, the cup was sent to Canada for safe keeping. Later it was sent on a cross-country tour and viewed by thousands of Canadians from Halifax to Victoria.

For some time it was housed in Princess Alice Barracks, Ottawa, war-time home of more than 800 airwomen stationed at Air Force Headquarters It is now retained at A.F.H.Q.

AIRWOMEN AND THE C.B.C.

The Canadian Broadcasting Corporation is interested in securing some personal notes on airwomen — news of promotions, awards, transfers, postings, engagements, marriages, etc.— for broadcasts to overseas and isolated units of the R.C.A.F. The purpose is to keep personnel informed about friends and acquaintances within the Service. Public Relations Officers have been asked to collect such material, and would appreciate help from airwomen correspondents.

A NOTE FROM GOOSE BAY

Flying Officer B. D. Sharp recently sent along the accompanying photograph. It shows a few of the girls of R.C.A.F. Station Goose Bay leaving for a snowmobile jaunt to the little settlement at North-West River, some 25 miles from the Station. During the winter the settlement can be reached only by snowmobile or dog-team, across the ice of the bay. North-West River is the central point for the care and education, by the Grenfell Mission, of Eskimo children from northern posts. On top of the snowmobile are (left to right) Cpl. Kay Althouse, A.W.1 Ruth Rundle, L.A.W. Denny Sabourin, Cpl. Kay Curry, Flying Officer Brenda Sharp, Cpl. Wanita McKinnon, L.A.W. Eddie Gallant. Standing: Cpl. Don Wakeham.

YOUTH

Young men are fitter to invent than to judge, fitter for execution than for counsel, and fitter for new projects than for settled business.

(*Francis Bacon.*)

Personnel Movements ★ ★ ★

OFFICERS: FEBRUARY

S/L V. L. Bradley — RCAF Stn Gimli to AMCHQ, Ottawa.
S/L D. J. Bullock — RCAF Stn St. Hubert to 1 FIS, Trenton.
W/C B. E. Christmas — 1 Air Div HQ, France, to NATO Defence College.
S/L D. R. Cuthbertson, AFC — 2 FWgHQ, France, to 441(F) Sqn, U.K.
S/L W. W. J. David — 1 SD, Weston, to ADCHQ, St. Hubert.
S/L G. R. Denison — RCAF Stn Chatham to 6 RD, Trenton.
S/L A. Jackson — RCAF Stn Comox to AFHQ.
S/L J. R. F. Johnson, DFC, AFC — 2 FWgHQ, France, to 416 (F) Sqn, France.
S/L A. A. Kempster — 6 RD, Trenton, to 1 GpHQ (Res), Montreal.
W/C H. C. Stewart, AFC — RCAF Stn Trenton to 3 AFS, Gimli.
S/L R. E. Young, MBE — 3 FWgHQ, Germany, to 1 SD, Weston.

OFFICERS: MARCH

S/L E. L. Banks — ADCHQ, St. Hubert, to RCAF Stn Trenton.
S/L G. L. Burness — ADCHQ, St. Hubert, to AFHQ.
S/L T. M. Burns — RCAF Stn Summerside to AFHQ.
W/C J. F. Edwards, DFC, DFM — 2 FWgHQ, France, to AFHQ.
S/L H. J. Galen — 1 AFS, Saskatoon, to RCAF Stn Rockcliffe.
S/L C. C. Graham — 11 SD, Calgary, to 30 AMB, U.K.
S/L H. N. Hinton — RCAF Stn Greenwood to RCAF Stn Summerside.
S/L J. J. Killarn — 1 AROS, Clinton, to 405 (MR) Sqn, Greenwood.
S/L G. F. McLoughlin — AMCHQ, Ottawa, to 1 R&CS, Clinton.
S/L R. G. Metcalfe — AFHQ to 3 FWgHQ, Germany.
S/L P. J. Presidente — RCAF Stn Rockcliffe to 408 (Ph) Sqn, Rockcliffe.
S/L N. C. Shipman — AMCHQ, Ottawa, to RCAF Stn London.

WARRANT OFFICERS: FEBRUARY

WO2 J. A. Bancroft — 2 FWgHQ, France, to 1 OS, London.
WO2 D. Fowler — RCAF Stn Portage la Prairie to 1 OS, London.
WO2 J. A. V. Fraser—408 (Ph) Sqn, Rockcliffe, to AMCHQ, Ottawa.
WO2 C. R. Grandy — 1 FWgHQ, U.K., to 12 TSU, Weston.
WO2 S. S. Langille — RCAF Stn Greenwood to 1 OS, London.
WO2 J. I. F. Masse — 30 AMB, U.K., to 1 Air Div HQ, France.
WO2 L. I. Milmine — CJATC, Rivers, to 1 OS London.
WO1 J. P. Niven — ADCHQ, St. Hubert, to 1 OS, London.
WO2 R. D. Periton — RCAF Stn Saskatoon to 1 TTS, Aylmer.
WO2 A. H. Sear — RCAF Stn. St. Hubert to 1 OS, London.
WO2 A. O. Smith — 436 (T) Sqn, Dorval, to 3 FWgHQ, Germany.
WO1 D. E. Vanziffle — RCAF Stn Edmonton to 1 OS, London.

WARRANT OFFICERS: MARCH

WO2 C. J. Baldwin — AFHQ to 1 OS, London.
WO2 F. H. Baker — RCAF Stn Rockcliffe to AFHQ.
WO2 W. O. Canning — 3 FWgHQ, Germany, to 431 (F) Sqn, Bagotville.
WO2 C. J. Capern — RCAF Stn North Bay to 3 FWgHQ, Germany.
WO2 J. W. Cowell — ATCHQ, Lachine, to 1 OS, London.
WO2 J. R. Ethier — AMCHQ, Ottawa, to 3 FWgHQ, Germany.
WO2 H. C. Gable — 1 Ph Est, Rockcliffe, to 6 RD Trenton.
WO2 J. H. Henderson — RCAF Stn North Bay to 419 Sqn, North Bay.
WO1 J. S. Hoare — 1 Air Div HQ, France, to AMCHQ, Ottawa.
WO2 R. S. Hughes — RCAF Stn Claresholm to AFHQ.
WO1 L. T. Lockwood — RCAF Stn Trenton to 1 OS, London.
WO2 J. A. Ramsay — FWgHQ, U.K., to ADCHQ, St. Hubert.
WO2 A. Smith — 3 FWgHQ, Germany, to 400 (F) Sqn (Aux), Toronto.
WO1 J. L. Titley — AMCHQ, Ottawa, to 3 FWgHQ, Germany.

WARRANT OFFICERS: APRIL

WO2 L. G. J. Dugal — RCAF Stn Rockcliffe to 30 AMB, U.K.

KEY TO ABBREVIATIONS

ADCHQ	— Air Defence Command Headquarters
AFS	— Advanced Flying School
AMB	— Air Materiel Base
AMCHQ	— Air Materiel Command Headquarters
AROS	— Air Radio Officers' School
ATCHQ	— Air Transport Command Headquarters
(AW)	— All Weather
CJATC	— Canadian Joint Air Training Centre
(F)	— Fighter
FIS	— Flying Instructors' School
FWgHQ	— Fighter Wing Headquarters
GpHQ	— Group Headquarters
(MR)	— Maritime Reconnaissance
OS	— Officers' School
(Ph)	— Photographic
Ph Est	— Photographic Establishment
R & CS	— Radar and Communications School
RD	— Repair Depot
SD	— Supply Depot
(T)	— Transport
TSU	— Technical Services Unit
TTS	— Technical Training School

GET OUT OR GET IN LINE

If you work for a man, in heaven's name work for him!

If he pays you wages that supply you with bread and butter, work for him — speak well of him, think well of him, stand by him, and stand by the institution he represents.

I think if I worked for a man I would work for him. I would not work for him part of the time, and the rest of the time work against him. I would give an undivided service or none.

If put to the pinch, an ounce of loyalty is worth a pound of cleverness.

If you must vilify, condemn, and eternally disparage, why, resign your position and, when you are outside, damn to your heart's content. But, I pray you, so long as you are a part of an institution, do not condemn it. Not that you will injure the institution — not that — but when you disparage the concern of which you are a part, you disparage yourself.

More than that, you are loosening the tendrils that hold you to the institution, and the first high wind that comes along, you will be uprooted and blown away in the blizzard's track — and probably you will never know why.

The letter only says, "Times are dull and we regret there is not enough work," etc.

Everywhere you find out-of-a-job fellows. Talk with them and you will find they are full of railing, bitterness and condemnation. That was the trouble — through a spirit of fault-finding they got themselves swung around so they blocked the channel and had to be dynamited. They are out of harmony with the concern, and no longer being a help they had to be removed. Every employer is constantly looking for people who can help him; naturally he is on the outlook among his employees for those who do not help, and everything and everybody that is a hindrance has to go. This is the law of trade — do not find fault with it; it is founded on Nature. The reward is only for the man that helps; and in order to help, you must have sympathy.

You cannot help the Old Man so long as you are explaining in undertone and whisper, by gesture and suggestion, by thought and mental attitude, that he is a curmudgeon and his system dead wrong. You are not necessarily menacing him by stirring up discontent and warming envy into strife, but you are doing this: you are getting yourself upon a well-greased chute that will give you a quick ride down and out.

When you say to other employees that the Old Man is a curmudgeon, you reveal the fact that you are one; and when you tell that the policy of the institution is "rotten", you surely show that yours is.

Let us mind our own business, and work for self by working for the good of all.

(*Elbert Hubbard.*)

FIFTEEN YEARS AGO

In presenting his departmental estimates for the fiscal year 1939-1940, the Minister of National Defence (Hon. Ian Mackenzie) told the House of Commons on April 26th, 1939: " . . . the conclusion has been reached — although, in regard to that conclusion, there are differences of opinion — that the first line of defence for the Dominion of Canada must be the Air Force." The sum appropriated was $29,775,565, which included $325,050 for Civil Government Air Operations.

For the fiscal year 1953-54, the R.C.A.F. estimates were $1,018,019,100.

WHAT'S THE SCORE?

Not long ago, in the course of finding out the answer to a reader's question on the subject of solvents, we had occasion to visit Mr. J. M. Macoun, the Assistant Chief of the Customs Excise Laboratory. We found him surrounded by bubbling retorts and alembics, busy analysing the produce of a seized still; and we were treated to so interesting a disquisition on the subject of alcohol that we asked him if he would mind recapitulating some of it in the form of a questionnaire for "The Roundel". Mr. Macoun left the R.C.A.F. in 1946 with the rank of Wing Commander, while serving as Director of Inter-Service Research and Development. Correct answers appear on page 48.—EDITOR.

1. As far as is known, spirits were first distilled by:
   (*a*) The Chinese, from wood.
   (*b*) The Arabs, from wine.
   (*c*) Homo Neanderthalensis, from auroch's blood.
   (*d*) The Greeks, from olives.

2. No good gastronomer, be he A.C.1 or Air Vice-Marshal, could fail to be outraged were he offered a glass of claret while eating:
   (*a*) Rare beef.
   (*b*) Chicken.
   (*c*) Dover sole.
   (*d*) Stilton cheese.

3. Alcohol is not used in the R.C.A.F.:
   (*a*) As a solvent in workshops.
   (*b*) By the medical branch.
   (*c*) As an anti-freeze.
   (*d*) For de-icing purposes.

4. Certainly unacceptable in a Canadian court of law would be Thomas Love Peacock's definition of intoxication:

   "Not drunk is he who from the floor
   Can rise alone and still drink more:
   But drunk is he who prostrate lies—

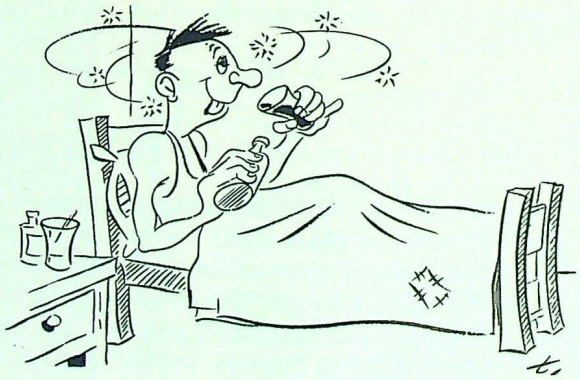
   (*a*) And snores away until he dies."
   (*b*) Without the power to drink or rise."
   (*c*) And lacks the strength to ope his eyes."
   (*d*) And cannot speak, howe'er he tries."

5. Denatured alcohol is alcohol:
   (*a*) Which has been triple-distilled.
   (*b*) From which the alcohol has been removed.
   (*c*) Recovered from methylated spirits.
   (*d*) To which nauseous materials have been added.

6. It has been conclusively established that a definite relationship exists between a man's susceptibility to intoxication and his:
   (*a*) Intellectual power.
   (*b*) Weight.
   (*c*) Athletic prowess.
   (*d*) Age.

7. Alcohol, taken internally, is:
   (*a*) A stimulant.
   (*b*) A febrifuge.
   (*c*) A depressant.
   (*d*) An antiscorbutic.

8. Hot rum, taken medicinally for a common cold, has virtue only as:
   (*a*) A soporific.
   (*b*) A sudorific.
   (*c*) An antiseptic.
   (*d*) An antibiotic.



9. "Aging", upon pure alcohol, has:
   (*a*) A strengthening effect.
   (*b*) A weakening effect.
   (*c*) A flavouring effect.
   (*d*) No effect at all.

10. In certain countries where legislation is rigidly applied to intoxication, the law maintains that no man (of 150-175 lbs. in weight, and on an empty stomach) is unimpaired after drinking more alcohol than is contained in:
   (*a*) Two small bottles of Canadian beer.
   (*b*) One and a half glasses of champagne.
   (*c*) A glass of Sherry.
   (*d*) An ounce of rye whiskey (30% under proof).

11. In Canada, the word "proof" means an alcoholic solution:
   (*a*) 57.1% by volume.
   (*b*) 50% by volume.
   (*c*) Weighing .75 as much as an equal volume of water.
   (*d*) Capable of dissolving its own weight of sugar.

12. The alcoholic beverage which wreaked most havoc among the intelligentzia of Paris during the last half of the 19th Century was:
   (*a*) Crême de menthe.
   (*b*) Cognac.
   (*c*) Absinthe.
   (*d*) French beer.

13. The connoisseur, while eating lobster, will never drink:
   (*a*) Graves.
   (*b*) Moselle.
   (*c*) Burgundy.
   (*d*) Chablis.

14. The habitual drinker is more likely than the temperate man to develop tuberculosis, because the steady consumption of alcohol:
   (*a*) Causes degeneration of the nervous tissues.
   (*b*) Is usually associated with late nights.
   (*c*) Paralyses the white corpuscles of the blood.
   (*d*) Occasions loss of appetite and consequent debility.

15. The chief danger of the "bath-tub" gin of prohibition days was the possibility of its containing:
   (*a*) Harmful bacteria.
   (*b*) Methyl alcohol.
   (*c*) Absolute alcohol.
   (*d*) Denatured alcohol.

16. When the tired Warrant Officer, about to enjoy his preprandial, pushes his glass aside with a growl of "Skunky!", the possible causes of his complaint could *not* include:
   (*a*) An insufficiency of hops.
   (*b*) Bacterial action.
   (*c*) Over-pasteurization.
   (*d*) The decomposition of the protein in his beverage by the action of light.

17. The purest (chemically speaking) potable alcohol sold in Canada is:
   (*a*) Bourbon.
   (*b*) Scotch whiskey.
   (*c*) "Whiskey blanc."
   (*d*) Imported gin.

18. The most immediate dangerous effect of drinking methyl alcohol, which is oxydized in human tissue to formaldehyde or formic acid, is:
   (*a*) Paralysis.
   (*b*) Insanity.
   (*c*) Death.
   (*d*) Blindness.

19. Methyl alcohol is a type of alcohol used industrially and made either synthetically or by the distillation of:
   (*a*) Potatoes.
   (*b*) Softwood products.
   (*c*) Barley.
   (*d*) Hardwood products.

20. The earliest recorded victim of alcoholic impairment is:
   (*a*) The skipper of the Ark.
   (*b*) A much-travelled boy-friend of Circe.
   (*c*) A Persian tent-maker.
   (*d*) A Chinese emperor whose name is associated with rare porcelain.

from COCKPIT to HUSTINGS

A Review Article by Wing Commander F. H. Hitchins, Air Historian

Some one has said that "there is no class of the community which thinks less of politicians than do the aviating people." If the dictum be true, it falls into the class of rules that are proved by their exceptions. In this instance the exceptions are numerous: one could cite a goodly number at home in Canada, and abroad there are the examples of Clostermann in France and Knoke in Western Germany. None of these pilots-turned-politician has gained such international prominence or been involved in so bitter and controversial a campaign as has "Sailor" Malan of South Africa, one-time Group Captain in the Royal Air Force, four times decorated for gallantry in combats in which he destroyed over thirty enemy aircraft and established himself as the R.A.F.'s second-ranking fighter ace.

In the autobiographies of Clostermann and Knoke, previously reviewed in these pages, it is only the airman who appears; the political activities of the authors receive but passing mention in a foreword or jacket note. Oliver Walker's biography of Malan* is painted on a broader canvas to include the subject's ancestry and early life before he joined the R.A.F., as well as his post-war venture into the political arena. Although half of the book deals with Malan the fighter pilot, the pages lack the vivid first-hand description of air combat that featured the other books. What these chapters lack in precise detail about the central figure is made up in some measure by the more abundant background material.

* * *

For over two hundred years South Africa has experienced a succession of language conflicts: Dutch against French, Dutch against English, High Dutch (Nederlands) against English and Afrikaans, and now Afrikaans against English. Malan's ancestry is a combination of these different strains; he is an "evolved" South African. His paternal forefathers were Calvinist Huguenots who settled at the Cape of Good Hope late in the seventeenth century. (Sailor's namesake and political foe, Dr. Daniel François Malan, Prime Minister of South Africa and leader of the Nationalist party, is a distant cousin.) Within a generation or two the French-speaking settlers had intermarried with the Calvinist Dutch, and the French tongue died out. Then English settlers came, and some of the numerous Malan family again became bilingual. In the Boer War they were found on both sides. Sailor's father, Willem (or Willie), joined the British, and in a skirmish with one of Smuts' patrols he received wounds that left him a lifelong cripple. Sailor's mother was English-born. Her parents emigrated to the Cape when she was an infant; there she grew up and was educated in the Huguenot Seminary. In 1909 she married

*Oliver Walker: "Sailor Malan — A Biography". Cassell & Co. Ltd., London; 1953. Pp. 182; illustrated. 10s.6d.

Willie Malan, then the manager of a Rhodes fruit farm at Wellington, Cape Province, and the next year their son was born, blending in his veins the blood of the French Huguenot, Cape Dutch, and English stocks that are the main strains of white South Africa. The year of his birth (1910) was also the year of the birth of the Union of South Africa.

On the baptismal register the baby was inscribed as Adolph Gysbert Malan and to his mother he was always Adolph; but through the years he acquired other names. In his naval cadet days he was nicknamed "Angel Face," to his wife he is "John," and to his comrades in the R.A.F. and now to everyone else he is known as "Sailor." Such a variety of names is appropriate. Born to the land, Malan left it as a youth to go to sea; from the sea he turned to the air, and then, after a few years at a desk, he returned to the land in which his family roots were planted.

His boyhood was passed on several farms, all in the Wellington area, to which his family moved in succession. Then, for some reason which Malan himself can not fully explain, the thirteen-and-a-half-year-old boy became, at his own request, a cadet on the naval training ship "General Botha," which had been presented to the Union by a stevedoring millionaire to lay the foundations of a South African navy. Malan was under the regulation age (14) when he joined the ship early in 1924; his fair hair, blue eyes, clean good looks and "air of eager inquiry" won him the nickname "Angel Face" but did not bring exemption from the strict discipline on board. Enforcement of discipline on the "General Botha" in those days began and ended with "a touch of the rope's end," and Malan's lasting memory of his two-year course is that of being tied down and thrashed for infraction of the ship's rules. The experience "helped to fashion a kind of stoicism that became an armour-plating for more strenuous days to come."

After completing the course on the training ship (plus an additional six months because of his youth), Malan, late in 1926, became a cadet on the "Sandown Castle" of the Union Castle line. He remained in the service for nine years, sailing mostly on the New York and Philadelphia run, and rose finally to the position of Third Officer. The sea, Malan says, bred in him "a kind of fatalism." "You know your destination weeks ahead . . . You get, too, a feeling of not belonging anywhere in particular." Towards the end of his career at sea he joined the Royal Naval Reserve for further training. He enjoyed it, particularly the gunnery work, but he did not like the "caste system" attitude of officers to men, and of the R.N. to the R.N.R. and R.N.V.R.

Feeling that future prospects in the merchant navy were poor, Malan applied for pilot training in the Royal Air Force and was accepted, getting in just under the wire thanks to a recent order which had raised the age limit to 25. After initial training, he chose to go on fighters so that he could have "something to throw about," and in No. 3 Flying School at Grantham he earned "special distinction" flying the Gauntlet. It was there too he earned the nickname "Admiral" in tribute to his naval background. The nickname accompanied him on his posting to an operational unit (No. 74 Squadron, at Hornchurch) until a very proper ex-R.N. type in the squadron, on learning that Malan was only R.N.R., promptly demoted him to "Sailor," and so it remained throughout his Air Force days.

1938 was an eventful year for Malan. He married an English girl; he was promoted to flying officer; his flight won the Sassoon trophy for fighter combat tactics; and his squadron was equipped with the Spitfire, a beautiful fighting-weapon. When, a year later, the war broke out, Malan, in one of his rare letters home, commented: "The Spitfire is a formidable machine and they will get a most unpleasant shock if they come over here. We are quite ready for them."

But the enemy didn't come over and the Spitfire pilots soon learned the truth of "Stuffy" Dowding's remark that "The life of a military aviator consists of hours of idleness punctuated by moments of fear" — or, as Malan expressed it, "I don't know which is worse, being perpetually bored or perpetually scared." For the first eight months of the war, No. 74's lot was perpetual boredom with hours of idleness. Then, in May 1940, the lightning flashed in the west, as it had

over Poland. Hitler's armies drove through to the North Sea and the Channel coast, and only a few minutes' flying separated Hornchurch from the Battle of France. Malan went into action for the first time on 21 May 1940, when a scramble took his flight over Calais, where he shot down a Heinkel 111 and a Junkers 88. For a week business was very brisk as the squadron made several sorties a day over Calais and Dunkirk. When No. 74 was taken out of the line for a breather on 27 May, it had run up a score of 30 enemy aircraft, and Flt. Lt. Malan had won the Distinguished Flying Cross. The citation mentioned that during May he had led his flight, and on occasions the squadron, on ten offensive patrols over northern France, and commended the "great skill, courage, and relentless determination" which he had displayed in his attacks on the enemy, personally shooting down two aircraft and possibly three others.

It was at this time, as the Battle of France was drawing to a close in mid-June, that Malan's son was born. (Prime Minister Churchill became the child's godfather.) A few nights later, when enemy raiders were dropping bombs near Westcliff-on-Sea where the mother and baby lay in hospital, Malan took off in his Spitfire to engage them and in quick succession destroyed two He. IIIs. This feat was cited when a Bar was added to the D.F.C. which he had won a few weeks previously. The text of the award also pointed out that during the Dunkirk operations Flt. Lt. Malan had shot down three enemy aircraft and assisted in destroying three more. Since the end of May he had continued to lead his flight, and on many occasions the squadron, in numerous successful engagements against the enemy. "His magnificent leadership, skill, and courage, have been largely responsible for the many successes obtained by his squadron."

Then came the Battle of Britain, and No. 74 Squadron was again in the front line, engaging the enemy formations as they swept in over "Hell's Corner." Malan and his fellow pilots added steadily to their scores. In two days of furious fighting, August 11th and 13th, they claimed 29 destroyed, 7 probably destroyed, and 15 damaged — and lost only three of their own aircraft. Sailor was promoted to command of the squadron, and before the year ended he put up the D.S.O. alongside his D.F.C. "Sqn. Ldr. Malan has commanded his squadron with outstanding success over an intensive period of air operations and, by his brilliant leadership, skill, and determination, has contributed largely to the successes obtained. Since early in August 1940 the squadron has destroyed at least 84 enemy aircraft and damaged many more. Sqn. Ldr. Malan has himself destroyed at least 18 hostile aircraft and possibly another six."

In 1941, when Fighter Command, having won the Battle of Britain, began large-scale offensive operations over enemy-occupied France, No. 74 quickly boosted its score to 127, notching up the last 33 tallies without losing a single aircraft to the enemy. On a sweep over the Channel, Sailor destroyed an Me.109 for his twentieth victory; another day he shot down two, and the next day two more. He was made a Wing Commander, and, in July 1941, little more than a year after he had won his first decoration, added a Bar to his D.S.O. "This officer," the citation said, "has displayed the greatest courage and disdain of the enemy whilst leading his wing on numerous recent operations over Northern France. His cool judgment, exceptional determination and ability, have enabled him to increase his confirmed victories over enemy aircraft from 19 to 28, in addition to a further 20 damaged and probably destroyed. His record and behaviour have earned for him the greatest admiration and devotion of his comrades in the wing. Recently the wing has scored heavily against the enemy, with 42 hostile aircraft destroyed, a further 15 probably destroyed, and 11 damaged.

Before he was taken off operations in August 1941, Sailor had further increased his score to at least 32 confirmed as destroyed and had become the top-scoring fighter pilot in the R.A.F. It was a brilliant record — achieved in less than fifteen months of combat — and it stood for three years until Wing Cdr. Johnny Johnson surpassed it in the summer of 1944.

Overstrained by two years of almost constant action, Malan was given a brief rest on instructional work before joining a mission of six top

fighter and bomber pilots that was sent to the United States in October 1941. Partly technical, partly propaganda in purpose, the mission was for Malan a rather depressing experience. His hosts' major interest seem to be "Have a highball?" A visit to Canada to see the progress of the B.C.A.T.P. was more encouraging.

Returning to Britain, Malan was posted to the Central Gunnery School at Sutton Bridge, where he evolved the "ten commandments" that were widely circulated through the fighter stations of the R.A.F. The gist of them was "initiative, aggression, air discipline, and teamwork . . . Get in quickly, punch hard, get out smartly." A first-class fighter pilot, Sailor said, must have three essential qualities: (1) an agressive nature . . . at all times be the attacker, (2) mind and body alert to react instinctively to any tactical situation, and (3) good eyes and "clean" hands and feet. Hands, feet, mind, and instinct, must all function as well upside down as right side up.

Promoted to Group Captain, Malan was put in command of the Biggin Hill sector at the beginning of 1943 and remained there for a year. During this period the sector scored its 1000th kill, an event that was celebrated by a big party at Grosvenor House. For Malan the occasion was doubly memorable, as, on the eve of the party, his second child was born — a daughter. In January 1944 he left Biggin Hill to train No. 20 Fighter Wing for "Overlord," and, when D-day came, he himself flew over the beaches to see how things were going. A period in command of an advanced gunnery school at Catfoss was followed by a staff college course; and then the war was over.

No doubt he could have stayed on in the R.A.F., but "the colour had gone out of the life" now; "peace meant a return to routine," and Malan hesitated. He was 35, and for the past 18 years he had been on the move: nine years at sea, nine more in the air. An "imperative urge gnawed at him" to return home to South Africa. So in 1946 he went back, to accept a position on the staff of the Anglo-American Corporation in Johannesburg. He remained there for two or three years; then he gave up his quiet desk job and turned to farming on a sheep and cattle ranch which he bought near Kimberley.

Sailor took this step apparently to escape from the political storm that had been brewing since Dr. Malan's Nationalist Party came into power in South Africa and began to "Afrikanerize" the Union. But escape it he could not, and soon Sailor was swept into the centre of the conflict.

* * *

Mr. Walker makes it very plain on which side his own sympathies lie in the controversy that came to a head in March 1951 over the Nationalist government's bill to remove the Cape coloured voters from the common electoral roll despite the provisions of the Union Act of 1910. In protest, the Torch Commando movement flared up across the country to defend the constitution. Sailor "was caught up in the spirit of protest" against policies which he thought were "making a farce of democracy": "the men and women who fought in the war for freedom still cherish what they fought for." He joined the Torch movement, and in June 1951 was elected its national president.

When the Supreme Court of the Union ruled that the controversial voters' Act was invalid, Prime Minister Malan set out to establish the "legislative sovereignty of Parliament", and both sides in the struggle began intensive campaigning for the national election that was to be held in the spring of 1953. Originally, the Torch Commando had disclaimed any intention of being a political party; it was "a pressure group with one main aim — to oust the Nationalist Government by all constitutional means." But contact with hard political realities forced it to put aside the initial ardent "flame of action" for the "smoke-screen of tactics," and the Torch Commando joined with two other opposition parties to form a United Democratic Front against the Nationalist government.

Mr. Walker's book was written on the eve of the election, before the ballots had been cast. He closes it with a question: what would Malan's future be? "He has no profoundly-reasoned programme of reforms, social and economic, such as his country needs. His creed is very simple:

'I believe in leadership'. Can he give that leadership?"

The question is still unanswered. In the national election of 15 April 1953, Prime Minister Malan's Nationalist Party was returned to power with increased strength, winning 94 seats against 64 for the combined opposition. The United Party, although it polled almost one-half of the popular vote, won only 57 seats. Sailor himself was not a candidate.

THE WIDER LOYALTY

Both the Air Force as a whole and the individuals within its ranks must actively participate in Canadian democracy or incur the distrust the public always extends to any group of public servants that becomes a closed fraternity.

If you were a civilian living in a small town near an air base, would you not resent the presence of a uniformed clique that talked Air Force and lived Air Force at least 90 per cent of the time? And would you not be extremely wary of those extremists who were almost 100 per cent Service-minded? The narrow military mind that is so incompatible with the give-and-take of democracy can engender bad public relations.

Military-mindedness is like a creeping paralysis. Air Force life and friends can be so enjoyable that one can divorce himself from ordinary society without realizing what is happening.

Of course, loyalty to the Air Force is very important; but devotion to oneself and to society is also essential for the modern soldier-citizen. If members of the R.C.A.F. do not hold tightly to these three reins of allegiance, if every one of us does not cultivate civilian friends and non-military ideas, the patient society that bears us may slip the traces and leave us stranded in a lotus-land from which there is no returning.

("*London Letter*": *R.C.A.F.*)

New Defence Research Medical Laboratories

By C. A. Pope, Defence Research Board

With the unveiling of a bronze plaque on February 12th, His Excellency the Governor General of Canada opened officially the new Defence Research Medical Laboratories at Downsview, Ont. This branch of D.R.B., which has enjoyed an unusually close association with the R.C.A.F. during the past four years, is concerned with investigating the special problems of Service personnel in relation to their duties, rather than with the curing or alleviation of illness.

D.R.M.L. stems from war-time Service research programmes. Its nine sections comprise a collection of D.R.B. laboratories that profit individually from a single administration, from the sharing of expensive equipment, and from a partnership of highly qualified scientists with diversified training.

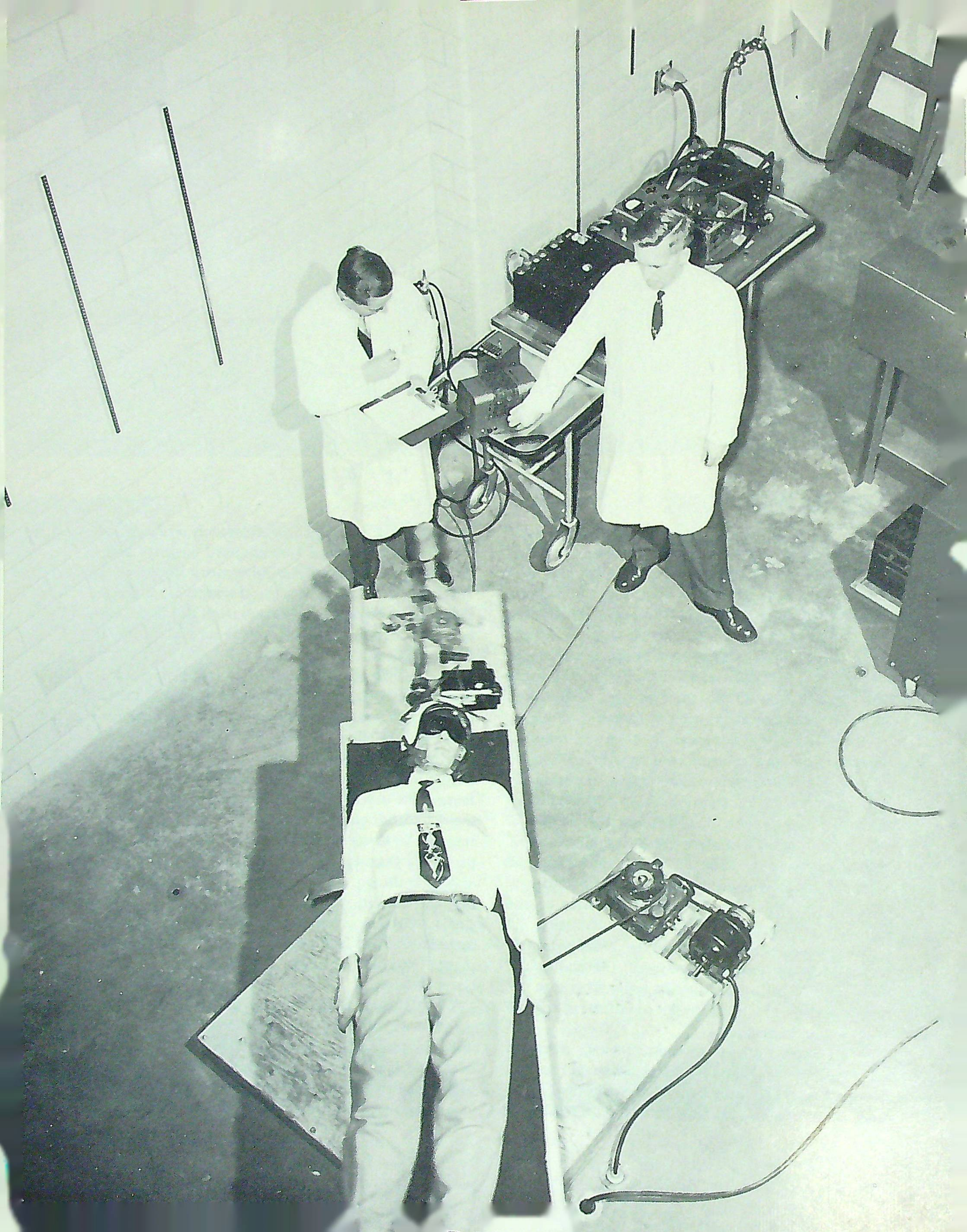
The merger, in June 1950, of the Canadian Army Medical Research Laboratories, of Ottawa, with the research functions and facilities of the R.C.A.F. Institute of Aviation Medicine in Toronto marked the birth of the establishment. It was located temporarily within the compound of R.C.A.F. Station Toronto in order to ensure the continuation of important aviation medicine studies then in progress.

Because of limited accommodation, some of the scientists worked in laboratories set up at Downsview Airport and on Bathurst Street, and in quarters made available by the University of Toronto and the Ontario Research Foundation. The establishment is now housed largely under one roof in the modern laboratory building at Downsview. Cumbersome research equipment that would be costly to move, such as the human accelerator (or centrifuge), will remain at R.C.A.F. Station Toronto.

A Clothing Research Section studies clothing principles, their functional properties and those of materials of potential or real value. The programme is co-ordinated with the Directorate of Inter-service Development and the Institute of Aviation Medicine in creating Service clothing items. Important activities include studies, from physiological standpoints, of protective wearing apparel relating to environmental hazards, and of clothing problems peculiar to each of the three Services.

Research on the adequacy of foods under Service conditions includes field tests on new items and the provision of technical advice and assistance. Food improvement and feeding arrangements play major rôles in the activities of the Food Section.

The Human Engineering, or Applied Experimental Psychology, Section aims at assessing military problems in relation to human capacities. Methods are devised, where possible, to alter the problems or tasks in the interests of increased ease and accuracy. Some current projects include visual



and other sensory problem studies, analyses of radar operators' errors, causes of accidents, methods of work and efficiency of operators of new control systems. The scientists have developed a navigator's compartment for large aircraft that has been endorsed enthusiastically by R.C.A.F. navigators. It will be displayed to the U.S.A.F. in the near future.

The Personnel Research Section strives to develop the effective uses of military manpower. This entails a search for improved methods of appraising manpower for, and allocating it to, diverse military employments. Operational studies and advice are provided for the Services on morale, motivation, and man-management problems, and on related issues of a socio-psychological nature.

Acceleration studies include cardiovascular research both on human and animal subjects. The human programme investigates tolerances to increased forces of gravity in various groups of aircrew. Experiments both with and without anti-*g* suit protection are conducted. Further studies in conjunction with the R.C.A.F. Institute of Aviation Medicine assess the value of different types of anti-*g* suits.

Problems of high-altitude physiology and aviation medicine are of importance to the aerophysiology team. Current stress is on the clarification of decompression sickness symptoms. Blood studies also rank high, as well as mobility and comfort improvements for existing partial pressure suits and masks.

A Bell-type decompression chamber can simulate atmospheric conditions up to altitudes of 100,000 feet, and laboratory facilities for blood-gas analyses are providing valuable information.

The animal research programme consists of heart pressure, electroencephalographic and electrocardiographic recordings, combined with angiocardiographic work. Rapid X-ray equipment installed last year is a particularly useful new tool in these studies.

Dr. W. H. Johnson records the reactions of a subject on an electronic turntable which induces motion sickness.

The most dramatic-looking equipment used by the team is the human centrifuge. This is a huge electronically-controlled device capable of producing forces up to 20 *g*, and it served the R.C.A.F particularly well during the latter stages of the last war. Recording equipment is incorporated into the machine for continuous records on test subjects throughout runs. The X-ray camera is capable of two exposures per second under *g* load.

The applied physiology team investigates primarily field problems, although laboratory work on the physical and physiological changes in joints exposed to cold is a current project. A typical activity is the assessment of physiological factors in load-carrying by infantrymen. Research facilities include a cold chamber and a tropical room.

Both the cold chamber and tropical room, which use human and animal subjects, are employed for interesting studies by the Section dealing with the Physiology of Cold. This Section aims at assisting humans in withstanding low temperatures. The rôle of Vitamin C (or ascorbic acid) in lessening animals' susceptibilities to the effects of cold is under careful investigation. The work was expanded recently to human subjects.

Scientists of the motion sickness and disorientation team are busy relating head motions to motion sickness, the bane of many military and civilian air- and sea-travellers. An electronically-driven swing and a powered turntable, unique equipments designed by the staff, play essential rôles in their experiments.

Further important studies are carried out by the Sonics Section, which investigates voice communications, the protection of the ear from noise, and the statistical characteristics of information. The work includes intelligibility studies, the efficient coding of messages, speech transmission, and the proper employment of receiving apparatus. Allied to this are studies of human capacities under a variety of noise conditions and of hearing losses from noise. Syllable and sentence characteristics also are being investigated. The Section is equipped with resonance and non-echoing chambers and with sound-measurement and sound-recording devices.

Military research on the effects of toxic materials is carried out in the Toxicology Section. This includes the assessment of chemical warfare agents and of therapeutic measures to offset their effects.

A Biostatistics Section assists all other groups in planning experiments and in analysing the results.

Sqn. Ldr. R. F. Epps, D.F.C., explains a display to His Excellency the Rt. Hon. Vincent Massey, Governor-General of Canada (right), and the Hon. Brooke Claxton, Minister for National Defence.

THE TEACHER

A teacher effects eternity. He can never tell where his influence stops. (*Henry Adams*)

Fifty Years of POWERED FLIGHT

By Sir Ben Lockspeiser, K.C.B., F.R.S.

(Reprinted by courtesy of "Nature": U.K.)

(This article represents the substance of an Evening Discourse at the Liverpool meeting of the British Association, delivered on Sept. 4th, 1953.— Editor, "Nature.").

To FLY like the birds was for centuries man's dream and desire. The Wright brothers succeeded, where so many others had failed, because of the relentless scientific attack they made on the problem of flight. "The world is not fully aware of all the tedious, gruelling scientific laboratory work they had to do before flight was possible." They invented the wind tunnel to study and measure air forces, invented their own system of control, and overcame difficulties of stability. They designed and built their own engine of some 20 horse-power, weighing not more than 240 lb.— itself a triumph of engineering at the time — and in the end designed and made a machine that would lift itself. Exactly fifty years ago this year, they flew this machine at Kitty Hawk in the United States and fulfilled the dream that man had cherished throughout the ages. It was a great achievement based on a rare combination of science, invention and engineering, and was one of the epoch-making events in history.

It is doubtful whether this machine ever climbed more than 10 ft. above the ground, for it had too much drag, too much weight and too little power to leave much margin for climb. But it was enough. A revolution in transport had been started. The main principles having been established and successfully demonstrated, progress was rapid. Six years after the flight of the Wright brothers, Blériot crossed the English Channel in forty minutes, and within sixteen years Alcock and Brown flew the Atlantic, for the first time, in less than seventeen hours. These three machines have changed the course of history.

SIGNIFICANCE OF STREAMLINED DESIGN

Low drag involves something more than absence of unnecessary parts projecting in the air stream. It implies certain standards of excellence in shape and lines; streamlined, in fact, and the lines we speak of are lines of air flow which, could they be made visible, as they can be experimentally by means of smoke, would be seen, in a perfect shape, to bend smoothly and flow snugly around curved surfaces of the structure, leaving no turbulent wake. Any departure from the ideal aerodynamic shape promotes the breakaway of the air flow from the surface and the formation of large-scale eddies or turbulence. This churning up of the air is sheer waste, and the power to produce it makes an unnecessary call on the engine. A very large effort has been spent in learning how to avoid this and to design and produce low-drag wings. By careful design and construction and smoothness of surface we can achieve laminar flow over more than half the depth of the wing (or chord as it is called), when a transition occurs from the laminar to a turbulent type of flow which gives rise to an

increase of drag. The best aircraft flying to-day carry wings capable of producing this type of flow, and we may be able, in the future, by the use of slots in the wing or by porous wing surfaces, to control the air flow by suction and push the transition point farther back to produce a near approximation to laminar flow.

For bodies moving in air at speeds below and not comparable to the speed of sound, the air behaves for all practical purposes as though it were incompressible, that is, its compressibility can be ignored. This does not hold as the speed of sound is approached. The velocity of sound in air at sea-level is about 760 m.p.h. and the effect of the compressibility begins to make itself sensibly felt above about 500 m.p.h. The effect of compressibility is to produce an increased drag rapidly growing with rising speed and reaching at the speed of sound a value many times greater than would be encountered if the air remained sensibly incompressible.

It is not immediately obvious why the speed of sound should play such a dominating and decisive part, and perhaps a few words from a purely physical aspect will not be out of place. At a speed well below the speed of sound or, as it is called, a low subsonic speed, the air conforms to a smooth flow pattern which extends forward of an aerofoil. The air ahead of the aerofoil is prepared in advance for its arrival, part being accelerated to flow over the upper surface and part over the lower surface. Clearly, the moving aerofoil possesses as it were a signalling system to warn the air ahead of its approach and allow it to take full advantage of its shape to slip through. What I have called the signalling system is based on changes of air pressure. The flow pattern is also a pressure pattern, for wherever the flow lines are curved a change of pressure occurs, giving rise to the lift and drag of the aerofoil. It is clear from the flow pattern that there is a pressure change ahead of the aerofoil, and this is the physical basis of the signal. Pressure changes in any medium are, however, not transmitted instantaneously, but with a particular velocity, dependent on the medium, and this velocity for pressure-changes of the order of magnitude under consideration is the speed of sound in air. It follows, therefore, that if the aerofoil is travelling at or above the speed of sound (that is, at sonic or supersonic velocity) it is robbed of any means of signalling ahead. The air can no longer be prepared for its arrival. The aerofoil can no longer slip smoothly through the air: it now meets it, inevitably, head on, producing a shock wave which is the source of the largely increased drag.

This is fundamental, for it is impossible to avoid the formation of shock waves whenever the velocity of the air relative to the surface exceeds the local speed of sound. This is bound to happen at a forward speed appreciably below the speed of sound in the atmosphere, because the air is accelerated in its flow over a curved body such as a wing. The shock wave occurs at the downstream end of the local region of supersonic flow, and behind it the speed is subsonic. The position of the shock wave depends on the shape of the wing section and its incidence, as well as on the forward speed. (A film, taken in a wind tunnel at the National Physical Laboratory, illustrated the formation of shock waves on a conventional symmetrical aerofoil as the speed increased from subsonic to supersonic, and showed the movement of the first shock wave back towards the trailing edge as the speed increases at constant incidence.) When the shock wave moves back, the low pressure in the region of supersonic flow ahead of it extends over a larger fraction of the aerofoil surface, and there is therefore a movement of the centre of pressure with speed and incidence. This causes a considerable change in the stability of the aircraft. The occurrence of shock waves may also cause conventional control surfaces to become relatively ineffective, and this has led to the adoption of all-moving tail planes as in the North American "Sabre." At supersonic forward speeds a bow wave is formed, and the flow again becomes stable with no serious changes in the position of the centre of pressure as the speed or incidence is varied.

Matters are complicated by the fact that the speed of sound does not remain constant but, because of the fall in temperature, decreases with altitude. It falls continuously from 760 m.p.h. at

sea-level until the stratosphere is reached, where the speed is 660 m.p.h. An aircraft flying at, say, 600 m.p.h. in the stratosphere is much closer to the speed of sound than when flying at this speed at sea-level. The significant and determining factor in compressibility phenomena is thus not the actual speed of the aircraft itself but the ratio of its speed to the velocity of sound at the altitude at which the aircraft is flying. It is usual, therefore, in dealing with the performance of high-speed aircraft, to speak of the Mach number, that is, the ratio of the forward velocity to the local velocity of sound.

It is clear that the onset of shock wave conditions at high subsonic speeds can be delayed by reducing the acceleration produced by curvature, and high-speed flight therefore calls for slim wings, nacelles, and bodies. These increase the speed at which shock waves first appear, called the critical speed, which can be raised still further by the use of swept-back wings, the effect of which is to reduce the effective thickness-to-chord ratio of the wing in the direction of flight, and hence to reduce the curvature of the wing surface. The effect of sweep-back in delaying the rise of drag is illustrated in Fig. 1, which compares the drag curves of two hypothetical modern aeroplanes of equal wing-areas — one square-winged and the other swept back 45°. The diagram illustrates also that the advantage of sweep-back disappears at high Mach numbers. A typical modern fighter having swept-back wing and tail surfaces is the Hawker "Hunter."

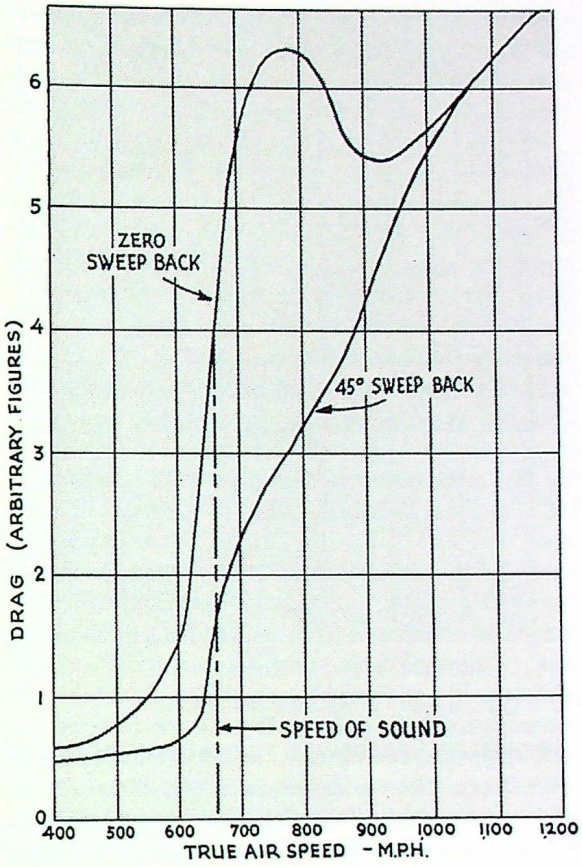


Fig. 1 Effect of sweep-back on drag at 40,000 ft. (equal wing areas).

High sweep-back, however, creates difficulties of its own. The twisting of the wing under load causes loss of lift at the wing tips, which in the swept-back wing are well behind the centre of gravity of the aircraft, giving rise to problems in pitch control. The degree of sweep-back required is related to the curvature of the wing surface which, diminishing progressively from the wing root to the tip, leads ideally to a crescent shape for a swept-back wing, thereby easing the control problem. This principle is embodied in the Handley Page "Victor" jet bomber.

The swept-back wing has been taken a step further in the so-called "Delta" wing aircraft, which embodies a swept-back leading edge and an unswept trailing edge, with the chord falling uniformly until it is zero at the tips. The main advantages of the "Delta" wing are its increased stiffness and stowage capacity: the former diminishes the wing-tip problem already referred to and helps to avoid flutter. The large centre-section thickness which becomes possible with a long centre-section chord enables jet engines to be completely buried in the wing, and space is also available for more fuel and payload. The latest "Delta" wing aircraft flying is the Avro "Vulcan" jet bomber.

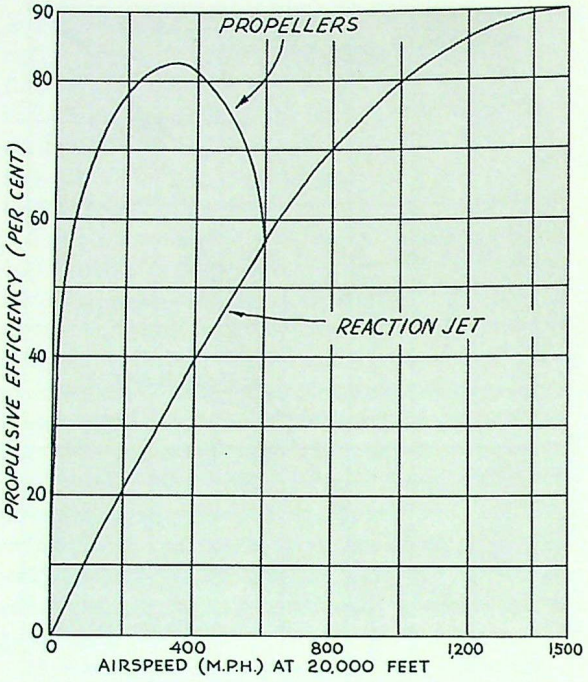


Fig. 2 Comparative propulsive efficiencies.

PROPELLER VERSUS JET FOR MOTIVE POWER

We have, therefore, means at our disposal for reducing the drag of aircraft both up to and well beyond the speed of sound; but the drag at these high speeds is, however, formidable enough, and the thrust to overcome it has only become possible by the introduction of the gas turbine and propulsion by reaction from a very high-speed jet of gas. Propellers, like aircraft wings, are subject to compressibility drag effects, and the combination of forward and rotational velocities introduces increasing drag conditions over a considerable portion of the blade area after about 400 m.p.h. Up to this point, from comparatively low speeds, the propeller is a very efficient means of propulsion, efficiencies of about 85 per cent being not uncommon; but at higher speeds compressibility drag becomes of increasing significance and the efficiency drops sharply. This is shown in Fig. 2, which contrasts this behaviour with the rise of efficiency of the jet as a means of propulsion, and explains why the use of a jet is so necessary for high-speed propulsion.

On this showing, the propeller ought to hold its own with the jet up to speeds of at least 500 m.p.h. and, theoretically, even beyond this figure, by the application to propellers of the principles of wing design for reducing compressibility effects already referred to. But, in practice, propulsion by jet is ahead of the propeller at lower speeds than this, because of other considerations. The elimination of the propeller eliminates also the disturbance of the air flow over the wing besides saving the weight and drag of the propeller. The turbo-jet engine is much lighter and occupies less space than a corresponding piston engine, offset though this is by the jet engine's higher fuel consumption. Range, of course, plays a determining part in the balance of these factors, but it is not the only one. The turbo-jet, particularly with axial flow compressor, can be built with a much smaller frontal area per unit of thrust than any other type of air-consuming engine, and it can be made to develop thrusts far in excess of anything hitherto obtainable. The superior efficiency of the jet over the propeller as a means of propulsion at high speeds, the absence of any propeller slipstream to increase drag, the comparatively small engine frontal area and the very high thrusts obtainable from these jets are the main reasons why the turbo-jet has swept the field in the high-speed range. Nor should we overlook the fact that the gas turbine is not fussy about the nature of its fuel. Aero piston-engines demand expensively manufactured fuels of high octane number, whereas the aero gas turbine will burn either cheap motor spirit or paraffin. Paraffin is preferred because it gives less trouble with vapour-locking at altitude, and because its calorific value per unit volume is slightly higher.

Before the introduction of the gas turbine, the piston engine had already been developed to a high degree of excellence both in performance and reliability. Concurrently, its weight per horsepower had been reduced from the Wright brothers' 12 lb. per b.h.p. to just over 1 lb. per b.h.p. to-day; and in co-operation with the fuel technologists its specific fuel consumption (that is, the fuel consumed per b.h.p. hour) has been brought down from about 0.6 to 0.42 lb./b.h.p./hour. The

aircraft diesel engine was not put into production in Britain, but in Germany the ingenious Junkers Jumo 205 opposed-piston two-stroke diesel engine had given consumption figures as low as 0.36 lb./b.h.p./hour in service. Unfortunately, it was very heavy for its power, weighing 1.8 lb. per b.h.p.

As I have already indicated, the gas turbine introduced by Whittle has revolutionized aircraft propulsion by making possible speeds which would be unattainable with a piston engine and propeller. The gas turbine can be used in two ways. First, all the power developed by the turbine is used to drive the compressor, and the exhaust is discharged as a high-speed, high-temperature jet of gas; this is the turbo-jet, of which the Rolls Royce "Avon" is a typical example. Alternatively, part of the power developed by a more powerful turbine — commonly about one-third — can be used to drive a propeller; this is the turbo-propeller engine. Each type of engine has its place in the field of aircraft propulsion.

The propeller turbine, intermediate between the straight jet and the piston engine and propeller, is heavier than the straight jet, but makes much more economical use of the same kind of cheap fuel. It can be quieter than any other kind of aircraft engine yet produced, and it is almost vibrationless. The Armstrong Siddeley "Mamba" is an example of this type of engine.

FUEL CONSUMPTION

Although we hear much about supersonic flight, which, of course, has been achieved, it is being more and more realized, if only because of the very high fuel consumption demanded by such high speeds, that it will be a very big step from our present subsonic civil airliners to the supersonic versions. When operating at extreme range, the "Comet I" takes off with 22 tons of fuel for 21 tons of aeroplane and four tons of crew and payload. Increasing attention is therefore being paid to the problem of greatly improving overall propulsive efficiency at high subsonic speeds. This can be done by the ducted fan or by-pass engine, which increases the mass flow of air through the engine and reduces the mean jet velocity. Such engines will probably reduce the fuel consumption by 25 per cent as compared with a straight jet. The Rolls Royce "Conway" is an engine of this type. It is a likely power plant for the DeHavilland "Comet's" successor.

The present emphasis on jets does not mean that the piston engine can be entirely forgotten. In small sizes, the gas turbine cannot compete with it in first cost or economy of operation. In large sizes, provided one does not want to fly much faster than 300 m.p.h., the compound engine (part piston, part turbine) can beat all the others for very long-range operation. In the United States, compound engines have been produced by addition of multiple-exhaust turbines geared to the engine crankshaft. The Wright "Turbo-Cyclone" is an example of this: it has a cruising specific fuel consumption of 0.39 lb./hr./b.h.p. and has been chosen to power the latest American long-range civil aircraft, such as the "Super-Constellation." In Great Britain the compound engine has, in my opinion, been tackled more fundamentally, and we now have the Napier "Nomad," which uses a two-stroke diesel engine with a high-pressure exhaust turbine. This engine has achieved the lowest specific fuel consumption ever recorded for an aircraft engine (0.33 lb./hr./b.h.p.) and weighs only 1.2 lb. per b.h.p.

MODERN ALLOYS IN AIRCRAFT DESIGN

The metallurgist has played a leading part in the great advances made in both aircraft and engines. When the Wright brothers flew, aluminium was little more than a scientific curiosity, a low-density weak metal of about 5 tons per sq. in. tensile strength. Modern aircraft aluminium alloys have a tensile strength as high as 40 tons per sq. in. with a density one-third that of steel, and the proof stresses of aluminium alloys have been almost doubled since the time of the First World War — an outstanding achievement providing a striking example of progress made under the spur of necessity.

The development of light alloys which could be rolled into sheet of high strength coincided with important advances in structural science and led to the introduction of the cantilever monoplane,

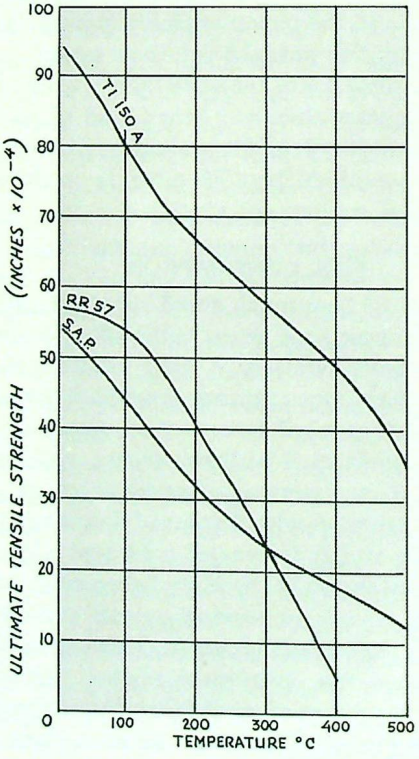
which created a major revolution in aircraft engineering. The main structural change was the introduction of stressed skin or monocoque construction. This innovation killed two birds with one stone. It replaced fabric with a more robust material, more capable of resisting deformation and change of aerodynamic shape, and it enabled the surface covering to contribute very substantially to the strength of the structure as a whole. It made the most efficient use of material by placing it as near as possible to the outside surface. The skin now provides nearly all the torsional stiffness, and it also contributes to the bending strength of the wing, thus enabling a reduction in the weight of the main spars to be made. The tail surfaces have developed on similar lines, while the fuselage early lent itself to monocoque construction.

The recently developed magnesium alloys, especially those containing zinc and zirconium, have proved of great value in light-weight castings, such as those for the reduction gear casings of aircraft gas turbines, for they have a strength/weight ratio nearly 20 per cent greater than that of the best aluminium alloys. Magnesium alloys are also becoming available as forgings, extrusions, and rolled sheet, with very promising engineering properties. High specific strength is not their only virtue: they can be machined faster and more easily than any other engineering material, and they have completely displaced aluminium alloys in aircraft wheels. Magnesium alloys now account for about one-third of all light-alloy castings supplied to the aircraft and engine industries, and the proportion is growing.

Light alloys based on aluminium and magnesium suffer, however, a rapid loss of strength with rise of temperature. This has for long been a serious draw-back in piston engines, where the piston temperature has limited cylinder diameter and power output. In the gas turbine, compression raises the temperature of air leaving a compressor with a compression ratio of 6 : 1 to well over 200° C., and copper-bearing aluminium alloy blades are now giving way to those of titanium alloys containing chromium and iron, the strength characteristics of which with temperature, compared with those of aluminium alloys and sintered aluminium powder, are shown in Fig. 3. Titanium alloys which have so far been investigated are twice as strong as aluminium alloys for one and a half times the weight, and further improvements in strength/weight ratio may be achieved.

Alloys for aircraft, however, require to be not only strong for their weight but stiff also, and, in this respect, present-day titanium alloys are, on a comparative basis, inferior to both aluminium alloys and steel by about 10 per cent. This matters a great deal; for the development of the modern aeroplane, particularly as regards speed, has introduced a new criterion in design, namely, structural stiffness, which is now a consideration comparable in importance with strength. A reasonable degree of stiffness is essential on practical engineering grounds, but the main concern is with flutter. This is a complicated aeroelastic pheno-

Fig. 3 Variations of ultimate tensile strength with temperature for various materials for compressor blades.



menon in which, at a particular speed, dependent on the characteristics of the structure, oscillations occur of progressively increasing amplitude, rapidly ending in structural disintegration. Flutter is the skeleton in the cupboard of all high-speed aircraft designers, for all structures are liable to flutter in a wind in certain circumstances, and the higher the speed the greater the risk. The best a designer can do is to ensure, so far as he can, that the flutter speed is well above the highest practical flying speed. Various measures can be taken to this end, but high stiffness both in bending and twisting is the principal safeguard.

In addition to strength and stiffness at the minimum cost in weight, a third criterion — fatigue — has to be taken seriously into account by the designer in his choice of materials, and this is becoming more and more a matter for anxiety as new alloys of higher static tensile strength come into use. Aircraft have to be designed to deal with not only their normal static loadings but also additional repeated loadings, due mainly to gusts encountered in the atmosphere, which vary greatly according to time and intensity. In the structural laboratory, complete wings are subjected to fluctuating loads, broadly representative of a flight in bumpy weather, until failure occurs.

PROBLEMS OF TAKE-OFF AND LANDING

As a consequence of these advances in the several fields of science, technology and design, and with a recognition of the vital part played by the skill of pilots, aircraft speeds have increased steadily with the years, and at an increasing rate, from a maximum speed of 70 m.p.h. in 1910 to more than 700 m.p.h. in 1953. Fighter aircraft are, of course, built primarily for speed, but transport aircraft and civil airliners have to compromise on speed to fulfil the requirements of range and economy. Their maximum speed is therefore lower, and their cruising speed, at which fuel is used more economically, lower still. Nevertheless, it is of interest to note that the cruising speed of jet civil aircraft is much closer to their maximum speed than is the case with propeller-driven aircraft.

High speed, however, carries certain consequences, among which is a high rate of fuel consumption which cuts into payload. We can get anywhere in the habitable world in hops of about 2,000 miles or so, and, as we pay for speed by fuel consumption, a fast aircraft at the beginning of a 2,000-mile flight is virtually a flying tanker. About half its all-up-weight is accounted for by fuel. This is not the only price we pay for speed, for higher flying speeds have involved higher landing and take-off speeds, and fast long-range aircraft are not only inevitably heavy but also demand long and expensive runways. Aircraft weight determines the thickness of concrete for a given sub-grade, and take-off speed, for a given acceleration, the length of runway. At the London Airport the longest runway is rather less than two miles, and concrete a foot thick is used on a stable gravel base. The airport covers nearly 3,000 acres and its estimated cost on completion is of the order of £21 million. If aircraft are to become larger and heavier, as is likely, the provision of concrete runways presents very serious economic problems.

The flying boat offers a possible means of escape. Until comparatively recently, the performance of the flying boat was inferior to that of the corresponding land plane, but several advances have now made it a serious competitor. The flying boat always had the advantage of being able to dispense with an undercarriage, which, in a modern large aeroplane, may account for 6 per cent of the total structure weight; but this was for a long time more than offset by the excessive size and weight of a hull which had to carry the propellers high above the water to keep them clear of the spray. Jet propulsion has changed all this, and a smaller hull, combined with improvements which can now be made in its aerodynamic design, may well tip the balance in favour of a flying boat for all-up weights of 50 tons and above.

Finally, we have in recent years come back to where Leonardo da Vinci began, and devoted serious attention to the rotary wing aircraft. It can never match the fixed-wing aeroplane for speed, but it can land on and take off from a small space, rise and descend vertically, and fly horizontally at a speed which gives it an advantage in door-to-door times for journeys of a few hundred miles.

ROYAL CANADIAN AIR FORCE Association

(This section is prepared by the R.C.A.F. Association and does not necessarily reflect the official views of the R.C.A.F.)

THE PRESIDENT REPORTS

By the time this appears in "The Roundel," I shall have represented the Association as National President for just about a year, and there are many activities upon which we have all been engaged. Some projects are new, but we still have the old ones which I have always placed under the heading "unfinished business". At the top of the list of the older projects we can place the Air Cadets; and, in second place, we can bracket the Ground Observer Corps and Civil Defence. These three projects are of national importance. Unfinished business includes Bon Voyage activities, the York Minster Memorial appeal, and a wider participation by Wings in the three days each year during which we can perpetuate the glorious traditions of the Royal Canadian Air Force (i.e. Air Force Day, Battle of Britain Sunday, and Remembrance Day).

However, it is not so much of these important matters that I wish to report to you, but rather of the activities in which I have been honoured to represent the members of the Association. You will recall that visits were made to many Wings in the Maritime Group and the Quebec Group during September and November of 1953, where much progress was noted, and these visits were reported in "The Roundel" and "Wings at Home". In addition, your President went to the United Kingdom and Europe for a two-week tour during October 1953, during which he presented an oil painting to Her Majesty the Queen, attended the unveiling of the Runnymede Memorial, visited York Minster in connection with the proposed York Minster Memorial, and finally visited some of the R.C.A.F. units of the Air Division.

More recently your President made a tour of our Western Wings, as arranged by the Groups concerned, leaving Ottawa on 19 February and arriving in Saskatoon on Saturday, 20 February, in time to participate in the proceedings of the Saskatchewan Group convention, and later the same evening to attend a dance where many members of the local Wing, No. 602, and of other Wings were met. The enthusiasm, both of the Group and the Wing members, was most encouraging.

Leaving Saskatoon we proceeded to Calgary, where the executive of No. 701 Wing was met and local problems were discussed. Wing accommodation in Calgary has been a problem, but, with the assistance of the Commanding Officer of No. 25 Air Materiel Base, it is hoped that new accommodation will be available for this Wing very shortly.

The next stop was at Vancouver, where a most enjoyable meeting was held in the Reserve Air Force Mess. At this meeting your President was able to review the activities of the Association and outline some of the projects in which we have a continuing commitment. This meeting was most enjoyable and afforded an opportunity for much "off-the-record" discussion.

The following evening your President was invited to address a gathering of former Air Force officers in Victoria, and this afforded an opportunity to point out wherein the interests of the group and those of the Association were parallel. Returning to Vancouver at a later date, your President was invited to inspect a parade of several Air Cadet squadrons, which included a splendid turn-out of girl Cadets. The parade was arranged by the Provincial Committee of the Air Cadet

Two hundred years of service are represented by these retired R.C.A.F. officers, photographed in Vancouver. Seated (l. to r.): Group Capt. C. J. Duncan; Air Cdre. A. H. Hull; Air Vice-Marshal G. E. Brookes, C.B., O.B.E., and Air Cdre. E. L. MacLeod. Standing (l. to r.): Group Capt. A. Lewis, A.F.C.; Air Cdre. R. C. Gordon, C.B.E.; and Group Capt. G. A. Mercer.

League, and enabled me to see at first hand one of the most important activities of our Association; namely, sponsorship of Air Cadet squadrons. I am sure this parade proved to be an inspiration to all the adults in attendance, and particularly to your President.

The next visits were to Edmonton and then to Red Deer, where a joint meeting of Wings of the Alberta Group was held. This meeting took the form of a banquet followed by a dance, and was very well attended by Association members and their wives, and also by the R.C.A.F. staff from nearby R.C.A.F. Station Penhold. Again progress of the Association was discussed and the members were complimented on local achievements, particularly in connection with "Operation Recruiting" carried out by No. 703 (Central Alberta) Wing in Red Deer.

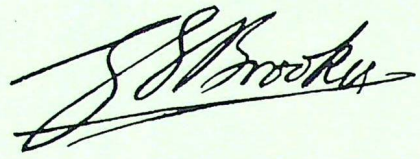
The next point of call was Winnipeg, where a regular meeting of No. 500 Wing was attended. This was the first meeting held in the new Wing quarters, and many members turned out for a most enthusiastic gathering. It was obvious that all concerned had the good of the Association at heart, and your President was afforded a most attentive hearing for what turned out to be a fairly comprehensive discussion of Association development, problems and progress.

Following the Winnipeg visit, a visit was paid to No. 502 Wing at Brandon, where your President was privileged to attend a regular meeting followed by a social evening. This Wing now has well-appointed permanent quarters, which reflect credit to all its members.

The visit to No. 501 Wing at the Lakehead was a very pleasant one. Since its inception this Wing has had the usual accommodation problem.

However, permanent quarters have been found at the Flying Club, and, as a result, the Wing hopes to double its membership in the near future.

Your President has now visited Wings in all sections of Canada, and the interest and loyalty of all members of the Association proved to be very heart-warming. He returned home with a feeling that the work of the Association was in good hands and its future success assured.



(G. E. Brookes)

No. 302 Wing dinner. Left to right: W. Le Gallais; Wing Cdr. E. L. Baudoux; Brigadier J. M. Rockingham; Mrs. G. Taschereau, and Sqn. Ldr. G. Taschereau, D.F.C.

AIR VETERAN PILOTS HUGE RAIL DIESEL

The following paragraph appeared in the "Vancouver Sun":

"Air Vice-Marshal George E. Brookes, with 38 years' experience at the controls of Canadian aircraft, took over the throttle of a streamlined C.P.R. diesel engine and brought a trans-continental passenger train into British Columbia. The Air Vice-Marshal, national president of the Royal Canadian Air Force Association, will attend the meeting of the local Wing in Vancouver, and deliver the president's report at the Reserve Centre, 1021 West Hastings Street. The president has recently completed a tour of the R.C.A.F. bases in England, France and Germany, where he found 'smartly trained, expertly equipped Canadian airmen who are second to none in airmanship'."

COLLECTION OF ANNUAL DUES

No. 601 (Moose Jaw) Wing has instituted a novel plan for encouraging members to pay their annual dues promptly. They have a slate of numbers from 1 to 100, from which five numbers, each of which carries a prize of a cigarette lighter, have been picked. The member who pays his dues at the time that the prize number comes up will receive a lighter. We think this is a very novel arrangement and should encourage all members to pay their dues promptly.

WING NEWS

No. 302 (City of Quebec) Wing.

Brigadier J. M. Rockinghan, C.B., C.B.E., D.S.O., was guest speaker at a recent "Famous Canadians Dinner" held under the auspices of No. 302 Wing, with Wilfred LeGallais in the chair. In his address Brigadier Rockingham paid tribute to the Canadian troops, saying that they established an excellent reputation in Korea, and also established a record in that no Canadian unit lost a foot of ground during the 14 months he was in command. He reported morale was high among the troops, despite trying conditions, and he recounted several amusing incidents which showed that the soldiers had not lost their sense of humour.

During the evening, Wing Cdr. E. L. Baudoux, D.S.O., D.F.C., presented Coronation medals to Mrs. A. Bélanger and Patrick Haberlin, members of the Wing.

The dinner was the first in a series of four to be held by No. 302 Wing at which famous Canadians will be presented as guest speakers.

No. 404 (Kitchener-Waterloo) Wing.

This Wing is very active in Air Cadet work and sponsors No. 80 Squadron. Net receipts from a Tag Day held for the cadets were $2,616. An oil burner and a desk and chairs for the commanding officer's office and orderly room have been acquired, and complete renovation of the cadet quarters in Knollwood Park has been carried out. The Wing provided special speakers for most of the cadets' meetings.

Familiarization flight for British Columbia girl Air Cadets under the command of Mrs. C. Hall (extreme right). (Artray photograph.)

No. 250 Wing and guests. Front row (l. to r.): Annette Stevenson and Deborah Pecore. Middle row (l. to r.): Cpl. and Mrs. M. V. Stevenson, Mrs. E. Pecore, and Sgt. Pecore. Standing (l. to r.) B. Carter, N. Jackson, and V. Carroll, all of the Saint John Wing. (Climo photograph.)

No. 410 (Ottawa) Wing.

The ladies of No. 410 Wing held a very successful St. Patrick's tea in their new clubrooms at 142 Sparks Street, under the convenership of Miss Margaret Carson. Assisting were Mrs. K. Walker, Mrs. A. T. N. Cowley, Wing Commander Helen Sutherland, Mrs. O. Mends, Mrs. V. Courtemanche, and Squadron Leader S. Evans. Guests were received by Mrs. H. McGowan and Mrs. J. P. Frame. Mrs. Ralph Rowland was in charge of the decorations. In the evening a well-attended dance was held for members and guests. An orchestra was in attendance, and the door prize, donated by a local firm, was won by Miss M. Johnston.

No. 412 (Windsor) Wing.

Hats off to the Windsor Wing for their good work during the past year. Not only do they sponsor two Air Cadet squadrons, but they supply the majority of the instructors. $4,500 was spent on Air Cadet work during the year. A noteworthy act of the Wing was the raising of $600 to provide for the immediate needs of the families of two members who died last year. The Wing has an active Ladies' Auxiliary which is in the process of acquiring full kitchen facilities for the club.

No. 427 (London) Wing.

London Wing is staging a drive to increase its membership 100 per cent. Good luck to them. A very commendable effort on the part of the Wing was a picnic held for the orphans in their city, and another was the Christmas Party for the orphans at which each was presented with an envelope containing spending-money. An International Night was held at Christmas in the clubrooms and was attended by several Dutch, Turkish, French, and R.A.F. personnel.

No. 250 (Saint John) Wing.

Members of the Saint John Wing were hosts to a number of Air Force personnel at an impromptu party aboard the "Empress of France" just prior to the vessel's sailing for England. The Air Force men were going to Germany and England as reinforcements for the Canadian N.A.T.O. forces there. At the party aboard the ship, wives and children of the Servicemen received gifts from the Association.

Identification badge worn by R.C.A.F. personnel and their dependents at Bon Voyage parties.

NO. 900 (ARDUA) WING

30 April, 1954.

The General Secretary,
R.C.A.F. Association.

Dear Sir:

As is probably the case with most Wings of the Association, we of No. 900 (Ardua) usually find ourselves with very little money in our bank account. The situation has never really become critical, but we would feel better with funds available for emergencies. So with this ever-present problem in mind, a special meeting was called at which we planned to discuss ways and means of replenishing the treasury.

It was quite a successful gathering, and ideas came thick and fast. Unfortunately most of them were no good. Our final decision, not too original

I must agree, was to hold a Tag Day. It did seem like a reasonably good idea, particularly since we number quite a few aggressive types among our members, and forcefulness appears to be the key to success in Tag Days above all things.

Preparations were elaborate, as we of No. 900 have never believed in going half-prepared into battle. For weeks in advance we had done surveys to establish the traffic pattern of the pedestrians as they went about their business on Saturday mornings. Our plan was to concentrate our forces on the busiest street, and put forth a maximum effort where the most people walked. We felt it would be a good idea to put our largest members at either end of the street, and we also planned to set up sidewalk barricades, with small openings in them through which the pedestrians would be funnelled, on the morning of our big day. Then, with a "tagger" on each side of the opening, the only way a potential customer could get by without being approached was to dodge around the barrier and out into the street. But we had them stopped there as well. The policeman on traffic duty on the street was a paid-up member of the Wing, and he agreed that he would clamp down hard on any jay-walkers on that particular day.

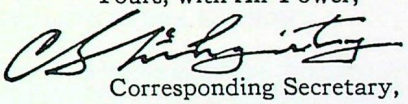
It was agreed right from the beginning that the best way to make a success of a Tag Day was to adopt the attitude that there was no such word as "no" in the English or any other language. Harass the customers. Plague them. To give us a complete coverage we had mobile teams organized who would watch the barricades for strong-willed citizens who slipped by without being tagged, and it was their assignment to nail these elusive individuals and use any method they thought fit to make them come across. We did, however, suggest that there be no physical violence. As I say, our plans were solidly laid.

Now, for the benefit of other Wings which might be planning similar activities, let me point out one precaution to take for sure — make certain that no other organization has Tag Day in mind. By the time we mustered our forces on the chosen Saturday and paraded, behind the Air Cadet band, to the scene of the proposed operation, barricades much like our own were already in place and being manned by the Moosetails, a local fraternal organization. Their men had already taken up all the spots we planned to fill.

There was nothing left for us to do but take to the side streets and attempt to "tag" the odd unwary citizen. All told we picked up $31.17 and three buttons. The total bill for incidental expenses was $27.73. One of our members did collect $3.50 from a chap who was slightly in his cups and thought he was buying an Irish Sweepstake ticket.

We will probably call another meeting in the near future to investigate other ways and means.

Yours, with Air Power,



Corresponding Secretary,
No. 900 (Ardua) Wing.

GOING OVERSEAS?

Travel, in the younger sort, is a part of education; in the elder, a part of experience. He that travelleth into a country before he hath some entrance into the language, goeth to school, and not to travel.
(*Francis Bacon.*)

Letters to the Editor ★ ★ ★

THE R.C.A.F. TARTAN

Dear Sir:

There seems to be some question concerning the history of the Air Force tartan. There are actually two Air Force tartans, the imported cloth and the Canadian-made cloth. The old country tartan is of different (finer) weave with a darker shade to one section in particular. This same section, in the Canadian-made tartan, is of a light blue shade.

There is still controversy over which tartan has been recognized by the R.C.A.F., and I have noticed a pipe band wearing both of them.

As to which tartan was registered in the old country, I cannot say, but I believe that Capt. I. A. MacLeod is correct in saying the Canadian-made was registered.

L.A.C. R. J. Tracy,
No. 10 Examination Unit.

THE 36 GRENADE

Dear Sir:

The note at the top of February's "What's the Score?" states that the Editorial Committee scored 15 out of a possible 20.

Now, I don't wish to cast a shadow on the veracity of this august body, but I maintain that it would be mortally impossible to score 15, since four seconds after they had answered question 13 they would have known the entire score — i.e. either harps or shovels.

From the drawing, it is assumed that question 13 refers to the "36 Grenade" and to the training given on a unit ground defence course in live-grenade throwing. If this is the case, the fuse is a four-second one, not a seven-second.

Flying Officer J. D. Eggleston,
No. 1 Tactical Air Command H.Q.

A THOUGHT FOR HOME-LOVERS

Dear Sir:

Not long ago I noticed a letter to the Editor bemoaning the few copies of "The Roundel" received by the lads.

But heaven help us, the boys in the field! It is not the senior N.C.O.s and officers who receive all copies of our publication.

The cover photo of the February issue of "The Roundel" shows one happy Canadian family in the hinterlands of our fair country. Undoubtedly, interior decoration in this day and age has taken a turn for the better. Hence, our beloved superiors cannot be criticized for having secreted all copies of "The Roundel."

It is perfectly acceptable to the writer that our Eskimo friends are supplied with copies of "The Roundel". However, if the mode of interior decoration is changing, would you see to it that sufficient copies of "The Roundel" are printed in order that we chaps in the field can get in step with this change. Spring cleaning is just around the corner out here in Western Canada and our living room is in dire need of repapering. Would you be so kind as to forward, when they become available, sufficient copies of "The Roundel" to repaper a room approximately 18′ x 18′?

Cpl. R. T. F. Bremner,
No. 1 Tactical Air Command.

(Cpl. Bremner has probably reconsidered his request now that colour has been discontinued on the inside pages of "The Roundel".—EDITOR).

— AND A NOTE FOR BIRD-WATCHERS

Dear Sir:

I recently received a report from one of our radar stations to the following effect:

"One night in November a large number of Arctic Geese settled on the lake, and by their constant gaggling added to the mystery of their visit. Some suggested that the radar had influenced the geese, but the sceptics ridiculed such a supposition. It was decided that, when the radar was shut down at midnight, proof could be obtained of the accuracy or fallacy of the suggestion, and, sure enough, by ten minutes after midnight the geese had departed. It was recalled that early in the evening the geese had circled the camp continuously for some time, and apparently had landed on the lake from exhaustion. The fact that they departed as soon as the radar was turned off is an indication that radar interferes with their migratory senses."

Wing Commander F. H. Hitchins,
Air Historian.

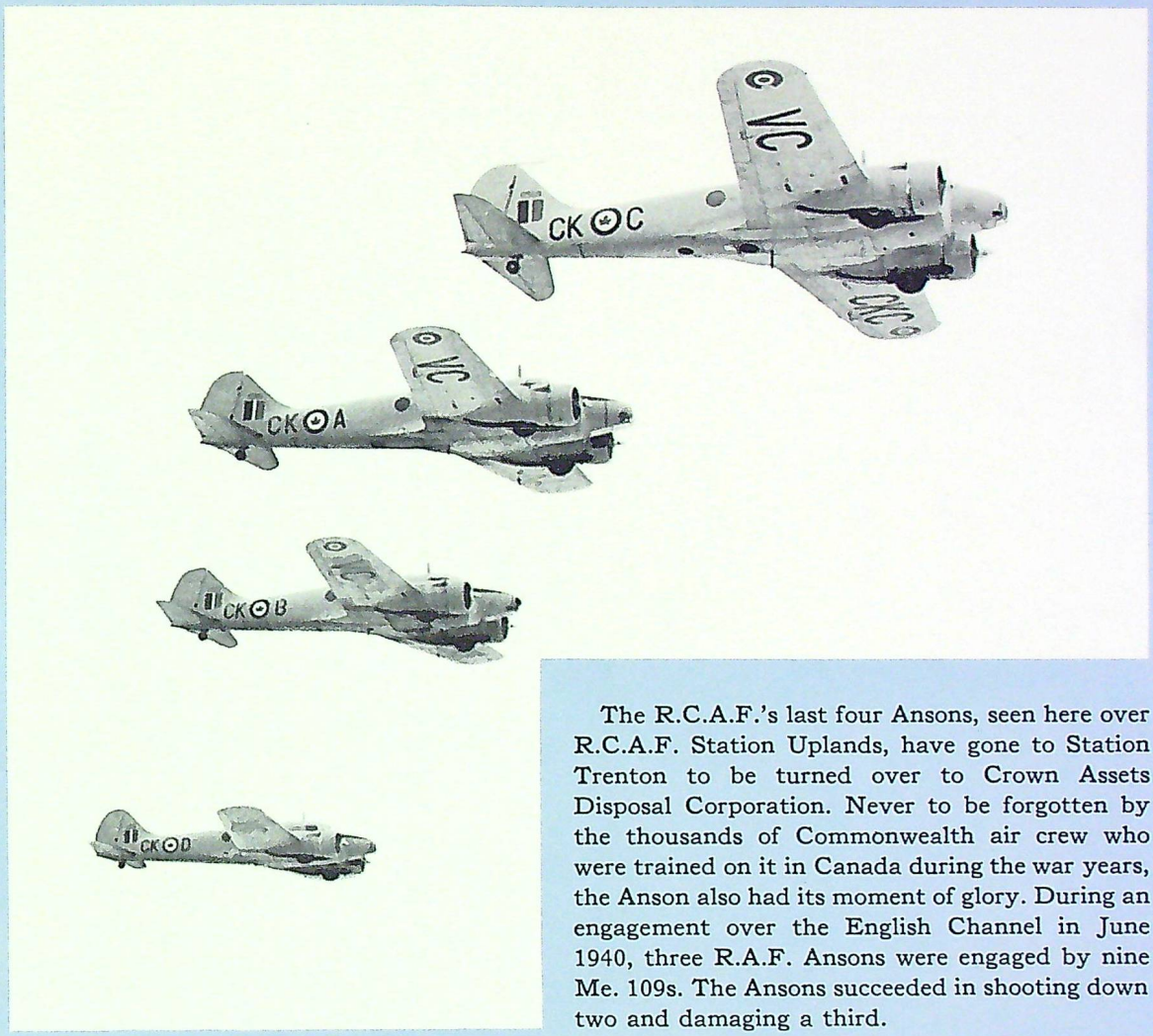
(Captain T. F. T. Morland, of the R.C.N., who is an ornithologist of some repute, reserves his opinion. The phenomenon may, he suggests, have had something to do with the station lights. Migratory birds, he tells us, have often been known to become temporarily disorientated by such things as lighthouses. Was there any noticeable decrease in the station's lights around midnight?—EDITOR.)

Answers to "What's the Score?"

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

The sage speaks of what he sees, the fool of what he hears. (Turkish proverb).

Good-bye, Old Faithful!



The R.C.A.F.'s last four Ansons, seen here over R.C.A.F. Station Uplands, have gone to Station Trenton to be turned over to Crown Assets Disposal Corporation. Never to be forgotten by the thousands of Commonwealth air crew who were trained on it in Canada during the war years, the Anson also had its moment of glory. During an engagement over the English Channel in June 1940, three R.A.F. Ansons were engaged by nine Me. 109s. The Ansons succeeded in shooting down two and damaging a third.


The
ROUNDEL