

## SOME PROBLEMS OF MILITARY AVIATION\*

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When I was approached for a talk to the members of the Aero Medical Society I thought that the best subject would be to deal with some of the problems of military aviation. I would like you to underline the word 'military', as military aviation is entirely different from aviation in general, except perhaps for landings, take-offs and flying from A to B, in peace time. The main differences arise out of the very distinctly different environment to which both military and civil aviation are devoted. In the case of military aviation you have got to be fully prepared to fight your enemy and you have got to have the better of him both mentally and physically. To that end, one has to prepare for all the situations which one may be placed during an operational sortie.

I would like to point out that most of these problems have existed since the advent of military aviation but have been accentuated due to the introduction of jet-propelled aircraft. Landing speeds have changed, thereby involving better judgment on the part of the pilots; the rate of descent has changed, thereby imposing certain strains on the crew; the operating height has been pushed up to such an extent that flying at that height has become quite a problem. It will be clear that due to the introduction of jet-propelled aircraft in civil aviation, they are also going to face some of the problems — but perhaps to a lesser extent.

In fact one of the problems which military aviation has been facing for a long time resulted in many disasters to the Comet aircraft and the stoppage, for some time, of the use of jet aircraft for civil aviation. Various explosions in military aircraft have gone unheeded and the hazard, perhaps, was fully driven home when civil aircraft were involved resulting in a large number of casualties.

Incidentally, here as well, while the civil jet aircraft can be satisfied by flying at 40,000 ft., in military aviation it is always an advantage to fly higher than your enemy. This is a simple and an old principle — that height over the enemy is always an advantage. Take the battles of the old days; one side always tried to be higher than the other so that it could observe and fight better. They also erected high forts for a similar purpose. Even in modern times, you will remember the case of "The Monastery" at Mount Casino, south of Rome, which was to some extent occupied by the Germans and which resulted in the Allied Forces being held up in their march to Rome for a long time.

The same principle can be applied to military aviation. You can well imagine that if an aircraft can fly at 80,000 ft., cannot be intercepted and has the means to carry out its operational tasks, it can fly about freely without danger. But military aviation must face the problems imposed by flying at such heights.

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I have dwelt a lot on the differences between military aviation and civil aviation but the problems facing military aviation do not get the attention they deserve particularly when advances in the performance of aircraft are taking place at such a rapid pace. The urgency of these problems can only be driven home with personal experience.

We have to realise the importance of aviation medicine and the importance of complete co-ordination between the advances in military flying and aviation medicine. We started on the right lines sometime ago when we trained a few medical officers to fly. That was indeed a step in the right direction.

#### Fear of Flying

Before I come to the many problems facing military aviation, I would like to deal with this question of 'FEAR OF FLYING' in peace time and in operations. The main thing to recognise is that fear of dying is present in nearly all human beings. It emerges out of the fact that there are now-a-days more situations in flying which can result in serious consequences. There are very few people in the Air Force with such complete disregard of fear as our Prime Minister. That has been shown under many difficult situations which he has faced with complete control and utter disregard of fear. You must have noticed also that whenever the safety margin in military flying is greater, there is less fear. The rejection of pilots on twin engine aircraft due to this cause is less than those on single engine aircraft because in twin engine aircraft, even if failure of one engine occurs, there are very good chances of making a safe landing on the other.

I have seen many different reactions in operations in Burma during the last war. In fact, in my case, I remember that during my first operational sortie, I was quite upset and frightened but I had to show a brave face to set an example to the squadron pilots. I knew that any sign of fear evident from my appearance and behaviour would have had a very serious effect on the morale of the squadron. I am sure that most of the pilots must have experienced similar feelings on their first operational sorties. As the experience in this line increases, confidence is built up and in the later stages, one develops some sort of disregard for danger.

What gave me confidence was that during my first sortie which I did with the late Eg. Off. Rao, both of us got a few bullets in our aircraft, which, incidentally, we only discovered on landing back at Imphal.

I remember that in my squadron there were certain pilots whom I considered very good pilots but who developed certain symptoms when they knew that the squadron was going for operations. As the day for departure drew near, their symptoms were magnified. They developed headache and tummy ache. They were, however, fully operational in the mess and on other ground duties given to them. These two diseases - headache and the tummy ache - are, I suppose, quite difficult to diagnose.

Naturally, in peacetime, such cases would be rare but I feel that one can spot aircrew who would not be able to face the increased dangers of operational flying. The

SUBORBITAL



symptoms of fear used to be termed 'lack of moral fibre' but lately the name has been somewhat changed and is now called 'lack of flying aptitude'. I, however, maintain that they are quite different though both categories deserve not to be kept on flying.

This is where our experts - the medical officers - should come in and when such symptoms of lack of interest in flying are noticed, they should take early remedial steps. I think by careful handling by the unit commander and by the medical officer such symptoms in the early stages can be remedied. On the other hand unless there is complete recovery, we would only be loading the Air Force with people who would let it down during operational flying.

#### High Speed, High Altitude Problems

As I said earlier, with the increase in performance of aircraft, flying and air fighting have also become somewhat more difficult. I have heard some people say that the Vampire is easier to fly than any piston-engined aircraft. That is quite natural as it is a very slow aircraft which does not fly very much faster than a piston-engined aircraft and has not got vices such as torque resulting in swing and a tail wheel requiring more care in landing. But fighting at a height in a Vampire aircraft is certainly more difficult.

But the Vampire aircraft is now obsolete and one has to think of aircraft flying at speeds greater than the speed of sound. These aircraft are going to impose problems such as explosive decompression, supply of oxygen, bailing out at high altitude, ejection at high speeds resulting in shearing and breaking of limbs and cold, Fascination Isolation

#### VISUAL PROBLEMS. Flying clothing.

While a jet aircraft can be unbearably hot on the ground, it can also be unbearably cold at very high altitude. This puts before us the problem of flying clothing. This would, however, be, to some extent, solved by the introduction of refrigeration in future jet aircraft. Even then the problem of simplified and effective flying clothing will continue to harass the Medical and the Air Staff for all time to come and one must take proper steps to provide this clothing in keeping with operational requirements.

The jet aircraft must climb and descend at a rapid rate in order to conserve fuel for operational efficiency and to attain an advantage in height. This rate of ascent and descent imposes certain problems which are already evident in all Air Forces, including our own, by the number of ear and sinus troubles that occur. Unless some prompt steps are taken these two symptoms would be on the increase, thereby, resulting in larger number of pilots becoming unfit for operational flying.

The problem of oxygen is of paramount importance as without it a pilot flying at 50,000 ft. or so will remain conscious only for a few seconds. One has to invent a fool-proof system to ensure that the supply of oxygen does not fail under any circumstances.

Though luckily the Indian Air Force has not experienced 'explosive decompression' very much, this would be a serious problem during operations when a bullet or two through the cockpit might result in such explosions. Incidentally that is why the difference



between the outside and the inside pressures in military aircraft is kept to the minimum even though there is slight discomfort to the pilot on this account.

There must be many more problems which have to be faced so that medicine does not lag behind the advancement in military flying.

#### Aircrew Care

There is no doubt in my mind that a complete reorientation in thinking is required to face the problems which will be imposed on military flying but ultimately the man behind the machine must count and it is up to all of us to see that he is in the fittest condition possible to face all the difficulties and hazards. I can assure you that financial difficulties can contribute to a large extent to the mental make up of an aircrew. Freedom from such difficulties can result in more operational efficiency on his part. When I refer to these financial difficulties I mean that he should have enough money to insure himself against the hazards of military aviation - and nobody can deny their existence - and for his children's education. If a flyer knows that his family will be looked after, he will certainly be prepared to take more risks in day-to-day and in operational flying. There is, again, the material comfort of homes and messes. We are all clear that in summer without sound sleep, it is not safe to fly and it is essential, therefore, to provide amenities necessary so that the aircrew can have complete rest in the hot weather. I seem to be harping on the comforts of aircrew without reference to any of the ground crew but any errors committed in the air can be more dangerous than any such errors on the ground.

#### Selection

The standards of aircrew for flying and fighting in modern aircraft are on the increase and we have to ensure that all aircrew are suitably selected for that purpose. The need for alertness, quick decisions and a cool head to face emergencies has more meaning now than a few years ago. We should, therefore, see that aircrew being taken into the Air Force have the essential qualities to fit themselves for military aviation of the future. I would say that even at the risk of not getting sufficient numbers, we must revise the standards of selection upwards and rigidly enforce them. We cannot afford to have people of lower intelligence when the tools they have to handle and the lives for which they are responsible are worth lakhs and crores and when the very security of the Country is dependent on them. You all know that unless a country has a strong Air Force, the other two forces are unable to operate effectively in present-day warfare.

On the other hand, it is easier to teach younger pilots flying techniques for modern aerial warfare. The degree of efficiency in air fighting does, in my opinion, proportionately decrease with age. You cannot expect the same air fighting efficiency, particularly in fighters, from a pilot of 40 as you would from a pilot of 22 or thereabouts. You must not, however, overlook the qualities required to make good officers; luckily, there is a very close relationship between a good pilot and a good officer. In my experience, I have seen that invariably a good pilot will be a good officer and vice-versa.

#### Conclusion

I would like to end up this talk by saying that we cannot afford to lose any time

in taking effective steps to carry out proper and thorough research into the problems of aviation medicine and we must establish without delay an effective Organisation and an Institute for that purpose. I would also like to say that the co-operation and co-ordination between pilots and the medical officers would be of great value to the service and lastly you Doctors must fly jet aircraft, do operational flying in all types of aircraft and see and realise the difficulties of military aviation yourselves. That is the only way to take really effective measures to meet the problems of survival in this Atomic Air Age.