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COMMUNICATIONS

THE COMPARATIVE FREQUENCY OF DEFECTS
OF VISUAL ACUITY AMONG ACCEPTED
AVIATION CANDIDATES, PUPILS, AND
EXPERIENCED PILOTS

BY

A. P. BOWDLER,

WING-COMMANDER ; PRESIDENT AVIATION CANDIDATES MEDICAL BOARD, R.A.F.

THE considerable number of cases of defective visual acuity, many of high degree, met with among the experienced pilots who have presented themselves for Civilian Flying Licence (B) has suggested that a comparison of their frequency with that existing among (1) candidates accepted for training as pilots; (2) pupils who have failed during actual flying instruction; (3) pilots recently qualified; and (4) pilots who have gained distinctions, might afford some information as to the bearing of visual acuity upon flying capacity.

With this object in view the total number, 4,319, whose records have been examined, has been divided into five groups according to the stages reached by the individuals in their flying careers, and the frequency of occurrence and degree of defects in the various

groups ascertained for comparison. No individual with worse vision than 6/12, 6/18, has been included.

The groups, which might in some cases with advantage have been larger, are described below :

GROUP I. 3,000 candidates examined and accepted for training as pilots. The records of this group have been analysed with a view to determining the frequency with which defects of visual acuity within the limit laid down in A.C.1, 1061, 1917 (6/12, 6/18), occurred among the average accepted candidates.

GROUP II. 123 pupils training as pilots who failed to qualify—failure occurring during actual instruction in flying.

GROUP III. 633 pupils who were successful in gaining their wings.

GROUP IV. 200 pilots who have been awarded the Distinguished Flying Cross, and in some cases the Bar.

The average number of hours flown by this group is not known, but it is probably considerable though less than that of Group V.

GROUP V. 363 pilots who have been medically examined by the Board when applying for a Civilian Flying Licence (B).

This group consists almost entirely of experienced pilots with an average of 800 hours flying per man. It includes no fewer than 110 pilots, each with 1,000 or more hours to his credit, many of whom were flying before the outbreak of war.

Not included in this group were 20 pilots examined for Licence (average hours flying 1000) who were found to possess worse defects than 6/12 6/18, and are referred to later.

NOTE.—Groups II. and III. were taken from a series of candidates accepted for training as pilots, whose subsequent histories have been traced. They include all the failures during flying instruction, and all the successful pupils from the series.

The percentage of individuals in the various groups who present defects of vision up to and including 6/12, 6/18, and also the percentages of the various degrees of defects based on the totals examined, are shown in Table I.

In examining the results, Group IV. and V. should be compared with Group I. as representative of the average accepted candidates, while Groups II. and III., forming as they do the successes and failures during flying instruction of a series of pupils, should be compared with one another.

From an examination of the figures in Table I, it is seen that the percentage of visual defectives is highest among the accepted candidates, and that there is a diminution of 4 per cent. in both the pilots with distinctions and those applying for Civilian Licence.

The percentages among the successful and unsuccessful pupils are distinctly lower than that of Group I, but are practically identical with one another and with that of the series from which the two groups were taken (18·9).

In considering the percentage under the various grades of defect

TABLE I.

	Number and % of cases of defective vision 6/12, 6/18 or less.		6/6 6/9		6/6 6/12		6/6 6/18		6/9 6/9		6/9 6/12		6/9 6/18		6/12 6/12		6/12 6/18	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<i>Group I.</i> 3,000 Accepted Candidates ...	736	24.5	283	9.4	99	3.3	21	.7	175	5.8	71	2.4	19	.6	52	1.7	16	.5
<i>Group II.</i> 123 Pilot Pupils Failing during Flying Instruction	23	18.7	6	4.9	4	3.3	2	1.6	5	4.1	3	2.4	1	.8	2	1.6	0	0.0
<i>Group III.</i> 633 Successful Pilot Pupils ...	118	18.6	35	5.5	20	3.2	5	.8	22	3.4	16	2.5	4	.6	13	2.1	3	.5
<i>Group IV.</i> 200 Pilots with Distinctions—D.F.C. ...	41	20.5	25	12.5	3	1.5	0	0.0	9	4.5	3	1.5	1	.5	0	0.0	0	0.0
<i>Group V.</i> 363 Pilots applying for Civilian Licence. Average hours flying, 800.	73	20.1	30	8.3	8	2.2	6	1.6	21	5.8	4	1.1	1	.3	2	.5	1	.3

within the standard allowed, it is thought advisable, in view of the small numbers with the higher defects, to group the defectives in two classes for purposes of comparison.

1. Those with small defects, *i.e.* ... $\frac{6}{6}$ $\frac{6}{6}$ $\frac{6}{6}$ $\frac{6}{9}$
 $\frac{6}{9}$ $\frac{6}{12}$ $\frac{6}{18}$ $\frac{6}{9}$
2. Those with large defects, *i.e.* ... $\frac{6}{9}$ $\frac{6}{9}$ $\frac{6}{12}$ $\frac{6}{12}$
 $\frac{6}{12}$ $\frac{6}{18}$ $\frac{6}{12}$ $\frac{6}{18}$

It is to be noted that those with normal vision in the better eye are placed among the class of small defects, as vision with both eyes together would be equivalent to $\frac{6}{6}$.

The number of defectives in the various groups classed in this way are shown as percentages of the totals examined in Table II.

TABLE II.

	Per cent. Small Defects.	Per cent. Large Defects.	Per cent. with either Defects.
<i>Group I.</i> 3,000 Accepted Candidates	19.2	5.2	24.5
<i>Group II.</i> 123 Pilot Pupils Failing	13.9	4.8	18.7
<i>Group III.</i> 633 Pilot Pupils Qualifying	12.9	5.7	18.6
Series from which Groups II. and III. were taken	13.9	5.0	18.9
<i>Group IV.</i> 200 Pilots with Distinctions	18.5	2.0	20.5
<i>Group V.</i> 363 Civilian Pilots	17.9	2.2	20.1

A comparison of the figures in the Pilot Pupil Groups I. and III. reveals little difference in the percentages of either small or large defects, and it appears that in the series from which these groups were taken defects of visual acuity of whatever degree within the limit of $\frac{6}{12}$, $\frac{6}{18}$ did not affect adversely the pupil's chances of success in gaining his wings.

Comparing Group I. with Groups IV. and V. there is a diminution in the number of small defects in the two latter groups amounting to no more than 0.7 and 1.3 per cent., respectively, while the percentages of those with the higher defects among distinguished

pilots and applicants for Civilian Licence are less than half that found in the group of accepted candidates and are certainly suggestive of some falling out of men with these defects.

If it be proved that the larger defects have diminished the pilot's prospects of flying on active service with distinction or of flying successfully over long periods, it will still remain to be shown whether the defect has affected his "flying" as distinct from his "fighting" capacity. Bad landings, defeat in aerial combat, or nervous breakdown, with which the defective vision may be correlated, are all possible causes of this elimination of the larger defects.

There are still to be considered the 20 pilots (average hours flying 1,000) presenting defects higher than 6/12, 6/18 who have not been included in Group V.

The degrees of defect in these pilots are shown in Table III.

TABLE III.

6/6 6/24	6/6 6/36	6/6 6/60	6/9 5/24	6/9 6/36	6/12 6/24	6/18 6/18	6/18 6/24	6/18 6/36	6/60 6/60
3	1	5	1	2	1	3	2	1	1

It is impossible to say how the frequency of these defects (5.3 per cent. of 383) among pilots examined for Civilian Flying Licence would compare with that found in a series of accepted candidates which included individuals suffering from such defects, but otherwise fit for aviation, as no records are available for comparison. The percentage is certainly higher than that found among the candidates who presented themselves for examination at the Medical Board, but this comparison is without value owing to the preliminary weeding out of many such defectives, which had already taken place.

It does, however, appear possible that so far as actual flying is concerned these defects of worse degree than 6/12, 6/18 may prove to be a less serious handicap than those of moderate grade, inasmuch as those suffering from the former generally recognize their disability and wear correcting glasses, whereas the possessors of moderate defects, confident in their own unaided vision, frequently discard the corrections which are ordered.

Summary

(1) Among the successes and failures of the pilot pupil groups there is little or no variation in the frequency of defects of visual acuity within the limit previously laid down.

(2) Comparing the groups of pilots of long experience and distinction with the accepted candidates, a diminution in the frequency of visual defects amounting to 4 per cent. of the total numbers examined is apparent in the former.

(3) Three quarters of this diminution has occurred in the larger, and one quarter among the smaller defects.

(4) Of 383 experienced pilots, 93, who in the aggregate had flown for 75,000 hours, failed to reach the standard of normal vision in each eye. Of these, 65 had small and 8 large defects within the standard fixed, while 20 had defects ranging from 6/12, 6/18 as high as 6/60 in each eye.

THE RADICAL CURE OF GONORRHOEAL IRITIS.*

BY

S. H. BROWNING, M.R.C.S., L.R.C.P.,

BACTERIOLOGIST TO THE ROYAL LONDON OPHTHALMIC HOSPITAL AND
ALL SAINTS' HOSPITAL FOR GENITO-URINARY DISEASES.

GONORRHOEAL iritis being a late sequel of gonorrhoea, is not as a rule seen first hand by a specialist in venereal diseases, with the result that it is more often than not treated as a local affection. In this way it has come to be talked of as "recurrent iritis," whereas few if any cases of gonorrhoeal iritis ought to occur in the first place, and certainly ought not to recur if properly treated.

The object of this paper is to try to show that by proper treatment of the genito-urinary tract and the cure of the disease existing there, a permanent cure of the gonorrhoeal iritis will follow; also to bring to the notice of ophthalmic surgeons their responsibility in seeing that their cases of gonorrhoeal iritis are adequately treated in the way I shall indicate. Gonorrhoeal iritis is, I think, a toxic condition and is not due to the presence of the gonococcus in the eye, for this organism has only been isolated from the eye in one case (Sidler-Huguenin), and then only from the blood stained exudate from the anterior chamber of a patient suffering from acute gonorrhoeal septicaemia. I have examined the gelatinous exudate from cases of gonorrhoeal iritis under the care of Mr. Lang, but have not been able to cultivate the gonococcus or find the organism in direct smears. These experiments were carried out under the most favourable conditions as the exudate was in all cases planted out on to suitable media within a few seconds of being drawn off.

Then, again, the rapid cures I have sometimes had after vaccine

*Read in the Section of Ophthalmology of the Royal Society of Medicine on Feb. 4, 1920.