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AUSTRALIENS IN THEIR OWN COUNTRY WHY THEY JOINED THE ROYAL AIR FORCE

The Royal Air Force was composed largely of officers from the Oversea Dominions. Australia's quota was some hundreds, most of whom are now back in their native land.

Service with this arm of the Imperial Forces has won them many decorations; yet, for some vague reason, the reception accorded to them in their own country has not been in keeping with our best traditions of fair play. We have heard it contended that, being Australians, these men should have served exclusively with the A.I.F., and that to "go over to the Tommies" was a breach of patriotism, to be treated as such when they came back.

It is noteworthy that the majority of officers now engaged in pioneering civil aviation in Australia are returned members of the Royal Air Force. In Western Australia we have Major Norman Brearley, D.S.O., M.C., A.F.C. (Air Force Cross); in South Australia, Captain Harry G. Butler, A.F.C., of whom a prominent South Australian recently wrote us: "It is the consensus of opinion that he is one of the finest flyers in the Commonwealth, and

several aviators who have passed through Adelaide have paid tribute to his skill and finish as a flyer."

Among Victorians, Major Lee Murray (Chief Engineer to Aerial Transport Limited), is one who gained his commission as a test pilot in the Royal Air Force; Captain Herbert J. Larkin, D.F.C., *C. de G.* (General Manager of the Larkin-Sopwith Aviation Company of Australasia, Ltd.), transferred into it from the Australian Engineers, while Colonel Stanley J. Goble, D.S.O., O.B.E., D.S.C., R.N.A.S., Air Adviser to the Royal Australian Navy, is yet another Victorian who happened to be spending his furlough in Melbourne when the Navy Department requisitioned him for duty. Flight-Lieutenant Sydney Pickles, a pioneer of commercial aviation in New South Wales, held a commission in the Royal Naval Air Service, as did Flight-Commander Dudley T. Angas, President of the South Australian Section of The Australian Aero Club, and Captain P. Roach-Pierson, the newly elected honorary secretary of the Victorian Section.

Independent inquiry as to why these officers joined the Royal Air Force reveals, in each case, one of three reasons:—

(1) He was in England at the time.

(2) He transferred from an Australian unit when the Royal Flying Corps urgently appealed for reinforcements—before Australia had an Air Force of its own.

(3) He possessed a knowledge of aeronautics and, being refused admission to the Military Flying School in Victoria, paid his own passage from Australia and enlisted in England.

A striking example of this last circumstance is discovered in the case of Captain Geoffrey Forrest Hughes, M.C., A.F.C., recently returned to Sydney after 3 years' valuable service with the Royal Air Force. This officer—a son of Sir Thomas Hughes, M.L.C., formerly Lord Mayor of Sydney—has devoted nine years to the science of aeronautics, his first practical model being built as early as 1911. In pre-war days he ran his own car, personally attending to repairs and familiarising himself with all the technicalities of motor engineering.

On making application in Melbourne, early in 1915, for admission to the Central Flying School, he was instructed to pack his kit and hold himself in readiness to proceed to Laverton at a moment's notice. After standing-by for eight months Captain Hughes was finally notified that, because his term of commissioned service in the Commonwealth Military Forces extended over only one year instead of two, he was ineligible for service with the Australian Flying Corps.

In March, 1916, he took passage to England, joined the Royal Flying Corps on June 3, and made his first instructional flight after three weeks' training, at Christchurch College, Oxford. On August 3 he sailed for France, the interval between his first flight and departure as war pilot being five weeks.

From August, 1916, until February, 1917, Captain Hughes remained in France with No. 10 Squadron, engaged mainly on artillery observation work, *i.e.*, day and night bombing, photography and contact. The machines flown by this squadron were *B.E. 2 C's*.

He then returned to England, and from March, 1917, until January, 1918, carried out instructional work on *R.E. 8's*, being

promoted to Flight-Commander in July, 1917.

January, 1918, found him back in France, with No. 62 Squadron, in which unit he flew *Bristol Fighters* until the end of May, when he returned to England and was appointed Wing Examining Officer to No. 21 Training Wing, stationed at Oxford, an appointment which he retained until demobilised on May 1 of the present year.

During his service with the Royal Air Force, this officer trained many Australian pilots, among whom may be mentioned Captain Howell, D.S.O., M.C., D.F.C., a competitor in the Anglo-Australian flight.

Captain Hughes was twice mentioned in despatches, was awarded the Military Cross in May, 1918, and the Air Force Cross on the King's Birthday, June 4, 1919.

With the object of clearing up a misunderstanding as to why some of our best flying men enlisted in the Royal Air Force, we print, hereunder, particulars of interviews and copies of correspondence between Sir Thomas Hughes and the Department of Defence at a time when there appeared every reason for belief that his son's services would be accepted in the Australian Flying Corps.

It should be added that Sir Thomas Hughes has personally described to the present writer his various interviews with the Defence Authorities in Melbourne, and has entrusted to us the original letters and telegrams referred to below.

Captain Hughes' first application having failed, Sir Thomas Hughes called upon the Minister for Defence (Senator G. F. Pearce), and the (then) Chief of General Staff (Colonel G. G. H. Irving), both of whom were sympathetic, and assured him that his son's qualifications would obtain his admission to the August School.

These interviews had the following sequel:—

(1) *July 30, 1915*: Urgent telegram from the Minister for Defence to Sir Thomas Hughes:—

Regret son does not comply with conditions for entry this school. Hope to be able take him for December school.

PEARCE.

(2) *July 30, 1915*: Urgent telegram from Colonel G. G. H. Irving (Chief of General Staff), to Sir Thomas Hughes:—

Son not selected. Hope take him for December course.

IRVING.

(3) *July 31, 1915*: Letter from Acting-Secretary, Department of Defence, to Sir Thomas Hughes:—

Dear Sir,—

OFFICERS' COURSE OF AVIATION,
AUGUST, 1915.

With reference to your son's application to attend the above course, I am to inform you that the same was fully considered. Unfortunately there were sufficient duly qualified candidates to fill all vacancies.

It is suggested that your son should apply to attend the next course, which it is proposed to hold on or about next December.

Yours faithfully,

T. TRUMBLE, Acting-Secretary.

(4) *August 3, 1915*: Letter from Sir Thomas Hughes to the Minister for Defence:—

Dear Senator Pearce,—

I thank you for your telegram informing me that my son does not comply with the conditions for entry into the Military Aviation School this month, but that you hope to be able to take him in the December School.

I shall be much obliged if you will let me know in what respect he failed to comply with the conditions laid down, in order that I may make sure of avoiding a similar difficulty next time. I am very anxious to get this information, as, in the event of there being any grave uncertainty as to his prospects of admission to the December School, I would endeavour to arrange for his training in England.

This both he and I would regret, as he is naturally anxious to be trained in his own country.

Yours faithfully,

THOMAS HUGHES.

(5) *August 5, 1915*: Letter from Acting-Secretary, Department of Defence, to Sir Thomas Hughes:—

Dear Sir,—

I am directed by the Minister to acknowledge receipt of your letter of the 3rd instant, relative to your desire to know in what respect your son failed to comply with the conditions laid down for entry into Military Aviation School this month.

I am to say that the matter is being attended to.

Yours faithfully,

T. TRUMBLE.

(6) *August 7, 1915*: Letter from Acting-Secretary, Department of Defence, to Sir Thomas Hughes:—

Sir,—

In reply to your letter of 3rd August regarding the admission of your son to the course at the Central Flying School, I beg to inform you that, under the conditions for admission to the qualifying course, your son did not possess the two years' commissioned service laid down.

It is proposed, however, to make certain amendments to these regulations, by which

cases similar to that of your son will be eligible for the course beginning in December next.

As soon as these amendments are promulgated a copy will be sent to you.

I have the honour to be, Sir,

Your obedient servant,

T. TRUMBLE, Acting-Secretary.

(7) *August 17, 1915*: Letter from Sir Thomas Hughes to Acting-Secretary, Department of Defence:—

Dear Sir,—

I thank you for your letter in reply to mine, in which you inform me of the reason why my son, Geoffrey Forrest Hughes, was not accepted for the last Aviation School, and add that the regulations as to two years' service as a commissioned officer will be modified before the next School in December. He will accept your suggestion to apply again for the December School.

Yours truly,

THOMAS HUGHES.

(8) *August 17, 1915*: Letter from Sir Thomas Hughes to Dr. A. L. Kenny, K.S.G., of Melbourne, who had been interesting himself in the case:—

My Dear Kenny,—

The Defence Department has written to me suggesting that Geoffrey should apply again for admission to the Aviation School at the beginning of next December, and I have replied accepting the suggestion. Meanwhile he has volunteered to go to Liverpool Camp to train recruits. This will prevent any appearance of skulking, which he dreads. If he does not get into the Australian School in December, I shall send him straight to England.

Yours very sincerely,

THOMAS HUGHES.

Meanwhile Captain Hughes was appointed Aide-de-Camp to His Excellency Sir Gerald Strickland, at that time Governor of New South Wales. It was while acting in this capacity at Government House, Sydney, that he met Colonel Irving and was assured by the latter that he would be admitted to the December School. "You have all the qualifications," said Colonel Irving, "it will be quite all right—you'll get in next time."

However, before the final selection of candidates, Colonel Irving was transferred to Cairo as Chief of the A.I.F. General Staff in Egypt, with the result that Captain Hughes was again overlooked. As soon as the December list was published he went to Melbourne and interviewed Colonel Irving's successor, the late Colonel Hubert Foster, who stated that he had no knowledge of the matter and referred him to Major (now Lieutenant-Colonel) E. H. Reynolds, O.B.E. The latter then definitely informed Captain Hughes that he would

have "no possible hope" of getting into the Aviation School, as plenty of qualified candidates were available.

Through his own Commanding Officer Captain Hughes now applied for leave to proceed to England, and received the following reply:—

(9) *January 5, 1916*: Letter from Major B. F. Parker, Commanding 26th Infantry, C.M.F., to Lieutenant G. F. Hughes:—

My Dear Hughes,

Your letter of yesterday reached me to-day and I have now forwarded to District Headquarters your application for leave to proceed to England in order to join the Royal Flying Corps.

I am sorry that you are driven to this, but there seems to be no alternative.

I would much like to have had you with me, but there again there would be nothing definite known for at least three or four months.

Regards and best wishes,

Yours truly,

B. F. PARKER.

(10) *January 7, 1916*: Letter from His Excellency the Governor General to the Military Secretary, War Office, London:—

Dear Sir,—

The bearer of this letter, Mr. Geoffrey Forrest Hughes, intends proceeding to England at an early date for the purpose of offering his services to the War Office.

Mr. Hughes—who is the son of Sir Thomas Hughes (a former Lord Mayor of Sydney), and has been acting as Aide-de-Camp to His Excellency the Governor of New South Wales for some time past—is anxious to obtain, if possible, a commission in the Royal Flying Corps; and from what I know of him, I feel sure that he should be well qualified for service with the Corps in question.

I am, yours faithfully,

R. M. FERGUSON,

Governor-General,

Commonwealth of Australia.

* * * *

It is interesting to record that, when taking a 14-day course at No. 1 Gosport School of Special Flying, Captain Hughes was passed out in Category 1A.—after five days. "One-A at Gosport," it need scarcely be explained, represents the hallmark of aeronautical efficiency.

As a final tribute to the disappointed young Australian airman whom the Defence Department had considered ineligible for admission to the Australian Flying Corps, we reproduce the following extract

from the *London Gazette Supplement* of May 13, 1918:—

War Office, May 13.

The King has been pleased to approve of the following Awards to the following Officers, in recognition of their gallantry and devotion to duty in the field:—

The Military Cross.

Sec.-Lt. (T./Capt.) G. F. HUGHES, R.F.C., Spec. Res.—While leading his formation over the enemy's lines he was attacked by 12 enemy machines, two of whom he shot down. On the following day, when in charge of a patrol, he attacked seven enemy triplanes, drove down one out of control, and forced three others to land. On another occasion, while in charge of a patrol, he was attacked by a large number of enemy scouts; owing to his skilful flying his observer succeeded in shooting down one of the enemy machines, which broke up in the air. He always showed the greatest coolness and courage in action, and, as a flight commander led his formation with splendid courage and determination.



Captain Geoffrey Forrest Hughes, M.C., A.F.C., R.A.F.

Declared ineligible for service with the Australian Flying Corps, this officer joined the Royal Air Force and passed "1-A" at Gosport, England.

THE LEAGUE OF NATIONS

No. 3.—BELGIUM.

Especially Written for "Sea, Land and Air"

By HAROLD H. JOHNSON

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[This article is the third of a series dealing, in alphabetical order, with the countries which have signed the covenant of the League of Nations. The next countries on the list, Bolivia and Brazil, will be similarly dealt with in our December issue.—Ed.]

Belgium, before the war, was a small but industrially important European country of approximately 11,373 square miles, and having a population of about 6,900,000 people; slightly less than that of Greater London.

Belgium is enclosed by France, Holland, Germany and the North Sea. The capital is Brussels, and the chief port, Antwerp. Belgium possessed some very fine universities at Ghent, Liège, Louvain and also at Brussels, all of which had fully earned world-wide admiration. Data for our knowledge of Belgian history before the tenth century is both scanty and confusing. Roman writers such as Cæsar and Tacitus were greatly interested in the tribes inhabiting regions which were subdued by Roman arms and Roman political genius and transformed "Gallia Belgica" into one of the most important Roman provinces in Europe, but after the Roman Empire broke up in the West the immediate fate of the Belgic provinces becomes a matter of little more than conjecture.

The Romans, according to Cæsar, drilled the tribes with true Roman efficiency as a bulwark against the German hordes ever ready to break over the Rhine. As the Roman troops were withdrawn to defend the heart of the Roman Empire, the Franks established their dominion over Northern Gaul and Belgium. The Frankish domination reached its zenith in the reign of Charlemagne, and with his death in 814, the history of Belgium entered on a glorious phase which closed with the absorption of the whole country into the dominions of the House of Burgundy in the fifteenth century. The practical results which were achieved under Frankish domination appeared in many ways, and although pro-

gress was delayed and thwarted by foes, the elaborate political system and the ecclesiastical system, which Frankish genius created under Charlemagne, left a very definite mark on the country; yet soon after his death in 814, it was seen that his genius alone had held the Empire together. The dominions of Charlemagne were divided about 30 years after his death, and out of the complexity of petty principalities striving for supremacy, the feudal states of Belgium at length stood clear, *i.e.*, Flanders, Hainault and Namur and the duchies of Brabant, Liège and Luxemburg, which, as already mentioned, were absorbed into the dominions of Burgundy in the fifteenth century.

The Crusades gave an enormous impulse to commerce; Bruges and Ghent became the largest and wealthiest towns in Europe and by the thirteenth century the former was the commercial clearing house of the western world.

Flanders was the most important of the States, and after its absorption into the Burgundian duchy, the next in importance, Brabant, after a long and vigorous independence, lost its integrity and passed through the same phases as Flanders. So, one by one, the States of Belgium, always apparently during the past few hundred years a tempting prize, lost their identity. The people of Flanders were known as Flemings; their ancestors in mediæval times greatly excelled in the textile arts and it was to the migration of large numbers of Flemings to England in the sixteenth and seventeenth centuries that the latter country owes its early eminence as a manufacturing nation. The Walloons were French protestants who inhabited certain parts of France and Belgium and many came to England in 1556 as refugees. They established them-

selves at Sandwich and some parts of the Eastern Counties and aided the development of local industries.

The Burgundian State, built up by a century of political genius, seemed threatened with disruption after the crushing defeat in 1477 at Nancy, where Charles the Bold was killed. The Belgian cities, as well as Louis XI. of France, at this time saw occasion to profit by her embarrassments and the feudal States compelled the new Burgundian ruler, Mary, to grant them their ancient liberties. Old feuds were resumed and consequently the cities were unable to offer any serious resistance to the marriage of Mary to Maximilian of Austria in 1477, when the country passed under the domination of the Hapsburgs. The son of this marriage, Phillip, who married Joanna of Aragon ten years later (1506), succeeded, in right of his wife, to the crown of Castile, and the outlying Belgian provinces became portion of the Spanish kingdom. Phillip's son and successor, Charles, later and better known as Emperor Charles V., found himself at the age of fifteen ruler of the Netherland, at sixteen, a Lord of Spain, with its immense colonial possessions, and, at twenty, Emperor. To his task of governing so many peoples and harmonising so many conflicting aims and interests, he brought extraordinary gifts of mind and body which were remarkable in an age of great personalities.

Charles abdicated in 1555, and his son and successor, Phillip, a Spaniard who had no ties of blood or interest to commend him to the Netherland subjects, found himself at war with France and in desperate need of men and money. His armies were led by a Flemish Nobleman, the Count of Egmont, and achieved notable successes over the French, but as soon as the campaign ended Phillip showed his hand. He insulted the nobility by refusing to allow them a part in the government of the country, and maintained a Spanish army to enforce obedience to his wishes. Religious persecution proceeded and the country soon seethed with indignation. Phillip was exasperated, and despatched, in 1567, his infamous Duke of Alva to crush all opposition. Alva resigned in 1573 and returned to Spain. He boasted that he had sent more than

18,000 people to their death. The most revolting forms of torture were in common practice, and it is small wonder that after his departure his statue was torn down and dragged through the streets of Antwerp.

A revolution of the Spanish soldiery in 1576 resulted in the conclusion of an alliance between the Dutch and Belgians. Dissensions soon appeared in the ranks of the patriots, largely the result of religious intolerance—protestant and catholic states being naturally unsympathetic—and heavy taxation and insecurity thwarted all commercial activities. Councils were divided, some calling in the help of the French, and others turning for aid to a German State. Fate, however, decreed that Spanish domination had not ended and the Duke of Parma was sent by Spain as Viceroy. His skill enabled him to crush opposition and, after successfully besieging Antwerp in 1585, Spanish authority was firmly re-established in the Belgian Netherlands.

It was in Flanders that the Duke of Parma equipped the great host which the Invincible Armada was to convoy to England. He, however, appears to have been a great administrator, for his death in 1592 was the occasion for a remarkably widespread genuine expression of regret, and his remains were accorded a public funeral in Brussels.

Spanish domination in Belgium continued until 1713. Its geographical position contributed as ever to its misfortunes. The land was coveted by France and Holland, who frequently took concerted action to drive out the Spaniards. By the Peace of Münster in 1648, Phillip IV. of Spain recognised Dutch independence and admitted the Dutch claim that the river Scheldt should be closed to all ships but their own. This proved a great handicap to Antwerp—once the greatest seaport in the world, but in 1863 a conference met at Brussels and arranged the purchase of the right to levy a toll which the Dutch had fixed at one and a half florins per ton on Antwerp's shipping. The festival of the Freedom of the Scheldt at Antwerp in 1863 was a national event of the very greatest importance. The Scheldt rises in the Department of the Aisne in France and flows 248 miles to the North Sea, pas-

sing Tournai, Oudenarde, Ghent, Dendermonde and Antwerp.

Another effect of the *rapprochement* between the Spaniards and the Dutch was to intensify the ancient feud between the former and the French. The acquisition of Belgium was henceforth a cardinal precept of French foreign policy and, by a succession of wars, large tracts of Belgium were added to the dominions of Louis XIV. of France. The conflicting claims which arose from time to time on the death of kings could only be settled, as they always have been, by force of arms. The memorable war of the Spanish Succession broke out in 1701 and lasted 12 years, during the greater portion of which military operations were taking place on Belgian soil—to the obvious detriment of the country. England, Holland and Austria were determined that Belgium should not pass under French influence, and history was repeated when in 1714 the Nations again arose to prevent Belgium passing under a foreign yoke. The Peace of Utrecht in 1713 ended the war of the Spanish Succession, but brought another change of domination to Belgium. The French had been driven out of the country, but Phillip V. had made good his title to be King of Spain, and the crowns of both France and Spain were in the Bourbon family. As an offset to this Bourbon preponderance, the Spanish Empire was partitioned and the Netherlands assigned to the Austrians in the person of the Emperor Charles VI.

Austrian rule was unpopular, although the day of delivery, in spite of insurrections, was postponed for 60 years. In that period, however, Belgium found a true friend in the Austrian Governor, Charles of Lorraine (a brother-in-law of the Empress, Maria Theresa), and during his long rule of 60 years the agitation died down.

Charles' successor failed. His great crime, in the eyes of the Belgians, was his attempt at ecclesiastical reform which brought about a revolution. About this time the French Revolution occurred in 1789 and one of the first acts of the new republic was to attack the Austrian Netherlands. The Austrians were defeated and, by the Treaty of Campo Formio in 1797, Belgium was officially in-

corporated with France, and Belgian history for the ensuing seventeen years is identical with that of France. Napoleon quickly seized the military advantages involved in the possession of the country and his remark on Antwerp as "a pistol pointed at the heart of England" has passed into history.

In 1815 the second fall of Napoleon brought the Powers of Europe face to face with the problem of Belgium's future. By the Treaty of Paris the Austrian Netherlands were united with Holland to form the kingdom of the Netherlands under King William I. The ultimate expansion of the two States was foreshadowed from the outset. Although the political patchwork seemed so pretty, the religious beliefs of the Belgians and Dutch were too deeply rooted to allow the union of the two nations to have any permanence. Just as in 1789 the outbreak of the French Revolution precipitated a revolt in Belgium, so in 1830 events in Belgium sympathetically followed events in France. The revolt against Dutch rule became a national movement. Large bands of insurgents cleared Belgium of Dutch troops until the Citadel of Antwerp was all that remained to them, and a provisional Government, which had been formed, declared Belgium an independent State.

King William I. submitted all outstanding questions to the arbitrament of Europe, and at a congress of the five great Powers which met in London, the new State was officially recognised. As regards the choice of a sovereign, this finally fell on Prince Leopold of Saxe-Coburg, who ascended the throne as Leopold I. The Dutch, however, invaded the country, but the Congress was resolved that its work should not be undone. King William I. refused to recognise the Treaty until his last garrison in Antwerp capitulated to a French army, and the matters in dispute between Holland and Belgium were finally settled in 1839.

The foregoing is a brief summary of the vicissitudes of the Belgian people as recorded in history up to that year 1839, since which time Belgium has prospered, being fortunate in her rulers. When King Leopold died in 1865, he had firmly established the monarchy in the hearts of

his subjects, and even the French example had quite failed to turn the Belgians to any other form of Government.

The year 1870 was a critical one for Belgium, owing to the outbreak of the Franco-Prussian war, but she was not required to do more than demonstrate, as England secured from both belligerents a promise to observe the neutrality they had guaranteed, and the promise was loyally kept.

The long reign of Leopold II. was one of great material prosperity and one in which the new nation has given great names in art and letters to the world.

and interests. The "Ten Days' Campaign" as it is called, found Belgium quite defenceless, but the intervention of a French army—to Great Britain's momentary alarm—saved the situation and the Dutch withdrew. Holland had, however, demonstrated her claim to consideration and the Powers agreed to modify in her favour the Articles which the Congress had drawn up. In November, 1831, a number of Articles were accepted by the Powers as the basis of agreement between Belgium and Holland. They allocated the Joint Debt in a manner less favourable to Belgium. Her freedom to navigate the Scheldt (the maritime door



BRUSSELS—The Palace of Justice.

King Leopold II. died in December, 1909, and was succeeded by his nephew, Albert I., whose ability and courage in many difficult circumstances have won for him the admiration and affection of all his subjects.

It may interest the reader to learn the reason for European Powers guaranteeing to respect the neutrality of Belgium, a pledge which Germany so flagrantly violated in 1914.

Within a few days of Leopold I. ascending the throne the Dutch army crossed the frontier in protest against the concerted Powers' disregard of Dutch rights

of Belgium as of Holland) was burdened with the payment of dues to Holland. The Dutch king could not resign himself to the loss of the Western portion of Luxemburg (a part of the territorial adjustment) and a joint demonstration by France and Great Britain alone induced him to evacuate Antwerp, which he still held. He, however, made peace with the Western Powers, undertook not to resume hostilities against Belgium and recognised Belgium's independence which, on April 19, 1839, received the guarantee of Europe as did her neutrality. In 1870 again France, Prussia and Great Britain entered into binding obligations to respect

the neutrality of the Kingdom and the extent to which this obligation was respected is fresh in the minds of us all.

Luxemburg, as known to this generation, is the eastern portion of the Grand Duchy which was neutralised as a separate State in 1867. The western portion has remained as a definite part of the Kingdom of Belgium.

In Belgium there are to be found some very wonderful architectural conceptions. The Palace of Justice at Brussels (completed in 1883), with its high dome and beautifully constructed interior, is one of the finest buildings in the world. Another famous building was the Cloth Hall at Ypres, built between 1201 and 1304. It is now, unhappily, little more than a heap of ruins. The historic belfry at Tournai, the Hotel de Ville at Bruges, the Hotel de Ville at Louvain, the Liège Law Courts, Antwerp Cathedral and other famous buildings testify to the national aspirations of the people.

Belgian artists have also left their mark. Frans Floris was a native of Antwerp and founded an important school of painting. Gerard David (1450-1523), a later master of the early Flemish school whose name has only comparatively recently received recognition; Quentin Matsys, the world-famous Peter Paul Rubens (1577-1640), Van Dyck (1599-1641) who painted unrivalled portraits, the brothers (Hubert and Jan) Van Eyck, Hans Memling and David Teniers, are names of men in the highest realms of art. The most famous of them, Rubens, was born in Westphalia on June 29, 1577. On the death of his father, Rubens, when barely ten years old, accompanied his widowed mother to Antwerp and was apprenticed first to Verhaecht and next to Van Noort—another famous teacher. Although not a native of Belgium, it was in that country that Rubens fulfilled his life's mission.

The most famous writer of modern times is a Belgian, Maurice Maeterlinck, who, a few years ago, was awarded the Nobel prize for literature. His writings during the war were an inspiration not only to the Belgians but to all who read his wonderful literature.

The Belgians are a very industrious

people. The educational curriculum lays the foundation for a life of activity.

The country is intersected in all directions by canals, and intensive culture of the land is a pronounced feature of the national life. The Botanical Gardens at Brussels are singularly beautiful. Lace making is a feature of Belgian industrial life, of which Malines, I think, was the centre. The Belgians are noted also for their very excellent pottery and glassware.

Their national heroes have been kept in perpetual remembrance by statues. The statue of Ambiorix at Tongres, the Ecclesiastical capital of Belgium, recalls a Belgian prince who was a contemporary of Cæsar and was freed by the latter from paying tribute. At Liège is an equestrian statue of Charlemagne. The Cathedral at Liège contains a bust of Saint Lambert which is so beautifully wrought that it deserves to be better known. Such works as these and the entrancing beauty of the internal decorations of public buildings have placed Belgian sculpture on a very high plane.

Now, the industrial activity to which I have referred was reflected in the high standard of comfort in Belgium. Dr. Bertillon, the French Statistician, made an elaborate calculation of the relative wealth of the individuals of various European countries and found that among the smaller nations the average was much greater than that of the larger nations, the Hollander's average being 16,000 francs and the average German's 9,000 francs. The difference in the population is not sufficient to explain so wide a margin, and if a nation's material wealth is to be the criterion of her worldly success, the teaching of our statesmen that increased production is to be our salvation needs little emphasis. Bolshevism ceases to be a danger when people enjoy a reasonable standard of living, because it must be remembered that poverty is productive of every form of crime.

Belgium has been pitifully devastated by the horrors of war, but with her geographical position and under wise governance, it is hoped that the Kingdom will soon enter upon an era of prosperity which she richly deserves.

FRUIT GROWING FOR EXPORT

A VISIT TO THE MURRUMBIDGEE DISTRICT

Especially Written for "Sea, Land and Air"

By MISS KAE McDOWELL

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The world's warfare is divided into two great branches—Military and Commercial. The first seeks to achieve its object by killing the men of other Nations; the second by capturing their wealth. Lately the pendulum's swing produced such an orgy of slaughter as was never known before. Commerce, in the ordinary sense, stood dumbfounded before it. Now, however, it has ceased and commerce, frantic at the waste incurred, is flogging its hounds down every avenue of profit.

Every nation is starting out hot-foot after the trade of the rest. Here in Australia we have caught a glimpse of the all-absorbing motive, and are rubbing our eyes with dismay at the world's intentions. The methods adopted often recall vividly tales of high-sea piracy.

A few weeks ago the following letter from a German business house was received by an Australian firm:—

"We take the liberty of sending you herewith enclosed, a copy of our wholesale price list and call your attention to the fact that the products therein listed, and which were formerly manufactured by C. Schering, Berlin; Fabrik von Heysler, Redebul; and Goldecke & Co., Leipzig, are now manufactured in the U.S.A., either by ourselves or under our direct supervision. Judging from inquiries received from time to time, these preparations have been difficult to obtain in your markets for a considerable period, and then only at a premium. The purpose of this communication is therefore to acquaint you with the fact that we are in a position to take care of all requirements for these products, and, with a few exceptions, at the normal pre-war prices.

"We solicit your inquiries and will be pleased to quote special export prices for larger quantities than specified in our list,"

Japan considers us a suitable dumping-ground for her goods; articles that are often so shabby that Japanese travellers have to use Australian samples to obtain their orders. This deception, by the way, has worked perfectly for some time. Commercial Australia, with bandaged eyes, bought ship-loads of practically worthless

goods. But, to quote Abraham Lincoln: "you cannot fool all the people all the time." The ruse is now worked out and our ingenious Asiatic neighbour is said to be contemplating others.

America also has turned an appreciative eye in our direction. As a market we carry the seal of her approval. A large advertisement which appeared in our dailies a short time ago caused much indignation among vigilant Australians. It was inserted by a large American firm which desired local agents for their goods. This concern, which has many "lines," appears to deal chiefly with food products, such as preserves, pickles, jams and canned goods generally; products which Australia grows herself and could, with a little encouragement, supply to her own customers, keeping the perfectly good dollars here. This firm intimates frankly that it is about to start a vigorous campaign to capture our market.

Revelations such as this lead us to ask in what state is our own fruit preserving? Is it inferior? On the contrary it is excellent and all that is needed to make the industry a brimming success, is the friendly support of the great Australian family.

It is time we awakened to the fact that we are being exploited by foreigners. Until quite lately "Made in Australia" was an inscription that acted like a blight. Japan, after all, has perhaps done us more good than harm with her shoddy products. She has forced us to recognise the superiority of our own goods. Rip Van Winkle is at last awake. "If I am to save my soul," he says, "I must produce."

It is in increasing production that we are going to lighten our greatest burden. It is no use sitting down and saying smugly that the problem of the returned soldier is settled, because it is not. The Repatriation Department is certainly struggling with it, but its efforts are like

those of an ant beneath the heel of an elephant. Only under the single-minded determination of the Nation in fostering industry will the difficulties melt.

Let us return to the question of fruit-growing and canning. In it there are immense possibilities. Last year's achievements in the irrigation areas opened the eyes of many people on this subject. It is estimated that by 1922, one thousand five hundred soldiers will have been successfully settled in the Yanco district alone.

Yanco settlers are doing well. The area was opened eight years ago, and many mistakes were, of course, made in those early days. To avoid a repetition of them an experimental farm was established. Here tests are made of the best varieties of fruit and the conditions needed for growing them. Also an intending farmer may spend three months there to familiarise himself with his business. During that time he receives full board and lodging and, if marred, is given a sustenance allowance for his wife and family.

Four hundred pounds is the sum settlers are advised to put into the proposition. Many a man has gone in with less, however, and made a success of it. One happy looking fruit farmer started in with £90

seven years ago. He is working 50 acres and last year he got £11 10s. per ton for his peaches. From 40 trees he averaged £2 10s. per tree. In the busy season the work is hard, of course.

One reaches the area through an avenue of beautiful Tasmanian blue gums. In the Murrumbidgee district there are now 5,000 settlers, and the scheme provides for a decent living for no less than 100,000. At Yanco, 576 farms are occupied and at Mirrool (the soldiers' settlement) 209. Thirty-four thousand four hundred and sixty-one is the total acreage under occupation and the settlers compute the aggregate capital as £532,560.

Many tales are told of the carving of the waterways and the coming of Burren-juck "the Lifegiver," who made the desert to blossom.

Very soon after the area was opened, which is exactly seven years ago, the need for a canning factory showed itself. It was clearly impossible that local and metropolitan markets could for long absorb the whole of the luscious products; and drying, though it disposed of much, could not compare with some other methods of preserving.

The erection of the Leeton Canning Factory (costing £90,000) was completed



Orchards at Murrumbidgee, New South Wales.

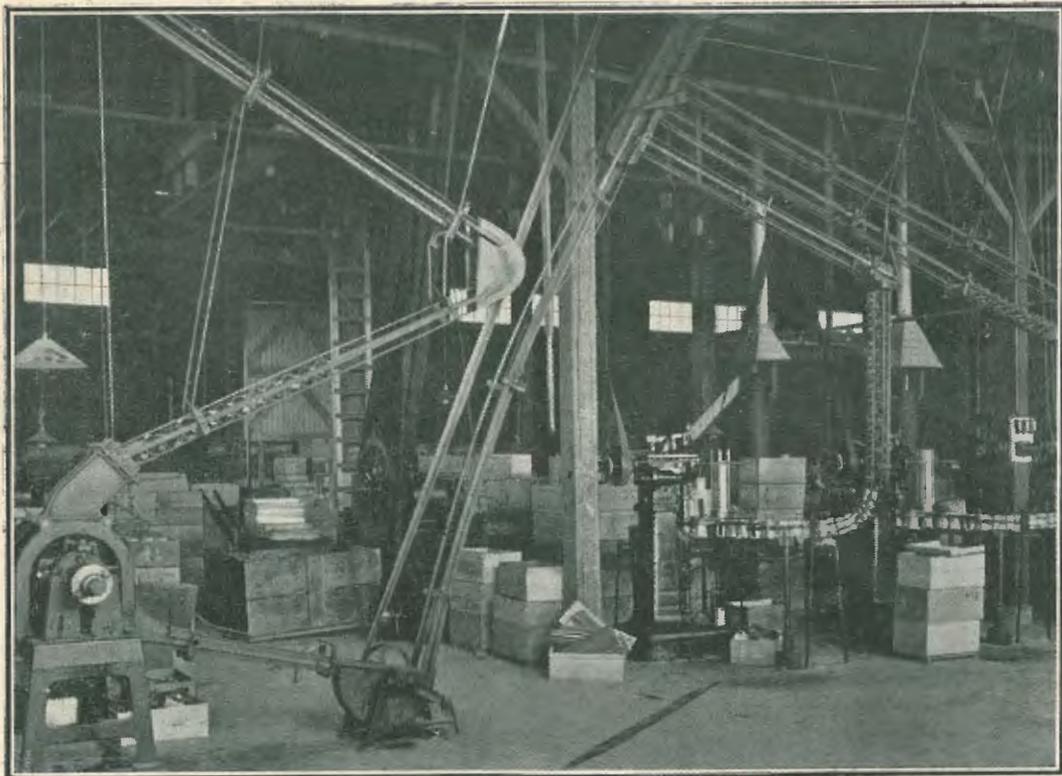
by the Lands Department, last year. It is perhaps the most up-to-date in Australia and its appearance was to the Murrumbidgee fruit growers what the sight of Mecca is to the Eastern pilgrim. To have a certain market for their goods was a big thing, but to have a local market where their produce could arrive in as perfect condition as it left the orchards was more. Its success was a foregone conclusion. Another on the same lines will shortly be established at Mirrool. It is also anticipated that a railway covering the distance of 40 miles between Yanco and Mirrool will be in operation within the next twelve months.

Delivery of fruit and vegetables is taken at the factory on a raised concrete platform, where there are four main doorways with a weighbridge to each. In the receiving room the bulk of the workers are employed, as the fruit has to be halved and the stones, or kernels, extracted. This work is also the most important, the ultimate appearance of the preserves depending on neatness and careful hand-

ling. Some factories employ splitting machines, but the manager here states that results prove that hand labour is best.

As soon as the fruit for canning has been pitted and sorted into three grades it goes to the "peeler"—a vessel in shape something like a boiler—into which the fruit is fed. The boiler contains caustic soda dissolved in water and kept at boiling point; this mixture loosens the fruit skin and a revolving drum takes it right off. The fruit is then washed and blanched and conveyed in automatic carriers to the "grader"—a machine consisting of a number of perforated copper trays, each perforation corresponding with a different "standard" size of fruit. Automatically the peaches are separated according to their dimensions.

The graded fruit is now conveyed automatically to the lower floor, on to tables where it is weighed into jars and examined for the second time. Then come the syrulers and, next, the exhausters.



A Section of the Can Manufacturing Plant.

The latter, by heating the tins, create a vacuum. Then the tins are sealed and fed, first to the cooker, then to the cooler. The final stage is testing the tins for leakages.

At Leeton the cans are manufactured on the premises, the plant being capable of turning out 100 a minute. The tin plate, cut to the required size, is fed to the first machine which, after doing its part, carries it on to the second, and so on to the third from which it emerges ready to receive the fruit.

In the busy season this factory employs about 350 hands—mostly girls. Situated as it is away in the country, the difficulty of procuring labour was one of the big problems that faced the Commission. An attractive accommodation scheme had to be arranged. Large dormitories were built, also recreation rooms and dining and bathrooms. During the

busy season a "providore" is engaged to look after the commissariat department.

Last year about 200 girls were employed, their quarters being under the control of a reliable matron. They state that they had a very good time, organising for themselves many little dances and other social affairs. A good worker earns from 15s. to £1 a day. It is expected that many more hands will be required during the coming season. The crop anticipated is a "bumper" one, and the manager is making preparations for the reception of 2,000 tons of the raw product.

Housewives will be interested in the expert opinion that Australia can make preserves equal to the best American. Also that the latter sell for 2s. a tin wholesale, while the Australian bring 1s. 4d. and 1s. 5d.

Preserves are already being exported to



Another View of the Can Manufacturing Plant.



Packing Australian Peaches for Export.

London, Norway, Sweden, New Zealand and the East. Trade with India is particularly brisk, and flattering reports of the quality of the goods have been received from each of these countries. It requires no occult gift to foresee Austral-

ian primary industries jostling the world's most exalted brands in the world's greatest markets. It is also safe to predict that canned fruits, vegetables and meats, will not be amongst the least of her exports.



The Fruit Canning Factory at Leeton, New South Wales.

“Sea, Land and Air”

will be sent, Post Free,
for 9/- per Annum.

VOLUME I.—BOUND FULL CLOTH, WITH INDEX.
(March, 1918—March, 1919) 12/6, Post Free.

Subscriptions should be sent to

THE WIRELESS PRESS, 97-99 CLARENCE ST., SYDNEY

COMMONWEALTH SHIPBUILDING

THE "DINOGA" LAUNCHED

THE "DELUNGRA" COMPLETES HER TRIALS

TWO MORE KEELS LAID AT WALSH ISLAND

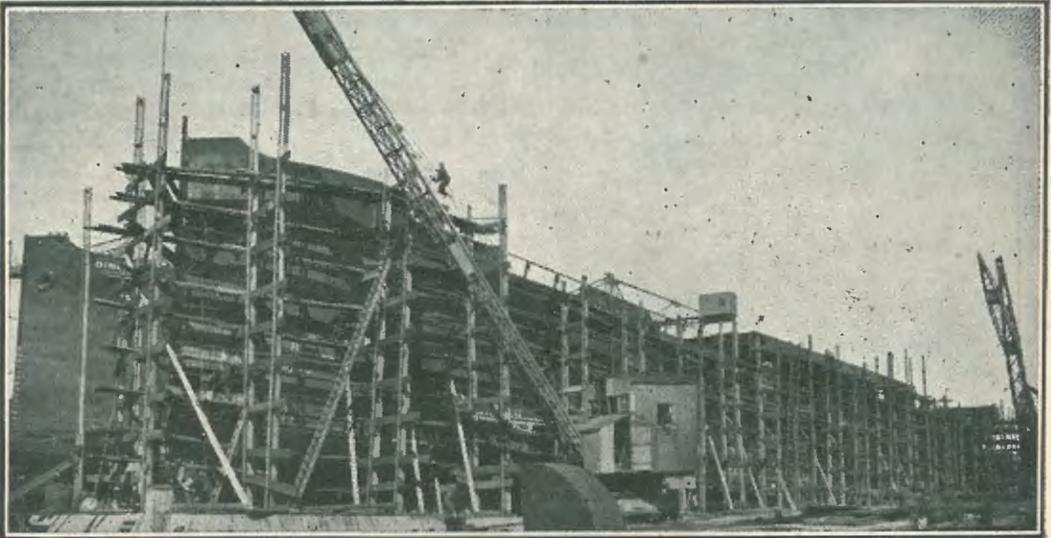
In our issue of September, 1918, was described the ceremony of laying the keels of "Commonwealth Ships Nos. 3, 4 and 5," the first Commonwealth cargo vessels to be constructed at Walsh Island, New South Wales.

"Ship Number Three," now s.s. *Delungra*, was laid at 2.45 p.m. on September 6, 1918, by His Excellency Sir Walter Davidson, K.C.M.B., and launched by Lady Davidson on March 25 of the

J. Poynton, M.H.R., and is expected to take the water early in 1920.

The *Delungra* has already completed her trials under steam, a successful run being made from Newcastle to Sydney on October 9, when a speed of slightly more than 12 knots was attained.

Mr. H. W. Curchin, chief executive officer for Commonwealth Ship Construction, who was a passenger during the trial trip, expressed entire satisfaction in the result, and added some interesting inform-



Commonwealth Shipbuilding at Walsh Island.

In the foreground is the *Dilga*, to be launched early in 1920, behind her is seen the *Dinoga*, launched on October 17, 1919.

present year, the time occupied in construction being 6 months and 19 days.

"Ship Number Four," s.s. *Dinoga*, was laid immediately after the *Delungra*, by the New South Wales Premier, Hon. W. A. Holman, and launched by Mrs. R. T. Ball (wife of the Minister for Public Works and Railways), on October 17, 1919, after 13 months and 11 days on the slip.

"Ship Number Five," s.s. *Dilga*, was laid some ten minutes after the *Dinoga*, by the Acting Minister for the Navy, Hon. A.

ation concerning further shipbuilding projects.

The Commonwealth Government, said Mr. Curchin, had on order 20 ships, six to carry 5,500 tons d.w. and others 6,000 tons d.w. Of the remainder at least four (probably six) would be of 12,800 tons deadweight capacity. The *Dromana*, launched at Williamstown on April 11, 1919—was now at sea; the *Delungra* would sail early in November for Ocean Island; the *Dundula*—launched at Cockatoo Island

one day ahead of the *Dromana*—will leave for Melbourne in a few days for installation of engines. The three vessels mentioned are each of 5,500 tons, and sister ships to the *Dinoga*. Still another, the *Dumosa*, is to be launched at Cockatoo Island during the next few days.

These five vessels, together with the *Dilga*—still on the slip at Walsh Island—complete the first part of the Commonwealth shipbuilding programme.

Orders for 14 additional ships have been placed as under:—

- Cockatoo Island—1.
- Williamstown—2.
- Walsh Island—3.
- Walker's Ltd., Maryborough (Q.)—4.
- Poole & Steele, Adelaide—4.

Work on twelve of these vessels has already been commenced and the engines in each instance will be capable of developing 2,200 horse-power.

The machinery for the ships now under construction at Walsh Island is being manufactured on the island; the machinery for those under construction at Williams-

town and Cockatoo Island is being supplied by Thompson's foundry, Castlemaine, while in the case of the other vessels the plants are being turned out at the works of the respective shipping contractors. The machinery is of standard design; the plans, together with all other necessary information, have been supplied by the Commonwealth Ship Construction Department, while the officers of that department are supervising the building of each vessel.

Work is to be commenced on the 12,000-ton vessels shortly at Walsh Island and Cockatoo Island. These ships, Mr. Curchin said, are to be of the shelter-deck type, having fo'c's'le and bridge; and they will steam 13 knots. Each will have 250,000 cubic feet of refrigerating space.

The launching of the *Dinoga* was attended by numerous visitors from Sydney and Melbourne, who were conveyed to Newcastle by special train leaving Sydney at 8.20 a.m.

The Ministerial party included the Hon. R. T. Ball and Mrs. Ball, Hon. R. B. Orchard (representing Sir Joseph Cook, Minister for Navy) and Mr. H. W. Curchin.

The *Dinoga* having been successfully launched, the keels of "Ship No. 41" and "Ship No. 42" were laid respectively by the Hon. R. T. Ball and the Hon. R. B. Orchard. The visitors then adjourned to afternoon tea in one of the large workshops, where speeches were delivered.

The speakers' voices, however, seldom rose above the clatter of crockery and the rattle of a thousand teaspoons.

Mr. Ball urged the island workers to cooperate with the Board of Control in establishing the industry on such a basis that future critics would no longer be able to say that Government institutions had "no soul, no spirit and no enthusiasm," and concluded his remarks with the hope that they would soon live down the criticism which of late had been so freely levelled at the Works.

Mr. Orchard reminded the workers that they were "up against" the Victorian yards at Williamstown, which, he claimed, compared more than favourably with Walsh Island.

Mr. A. E. Cutler, M.I.C.E., M.I.M.E. (Director of Engineering), expressed his belief that Walsh Island would soon prove such a success that the present and future Governments of Australia would be justly proud of it.



Ready for Launching.

The Commonwealth Cargo Steamer *Dinoga* (5,500 tons), on the slip at Walsh Island, New South Wales.

THE CRUISE OF THE "STORMY PETREL"

AN INTERVIEW WITH CAPTAIN STANLEY SPAIN

Especially Written for "Sea, Land and Air"

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Mr. S. M. Dempster's 25-ton auxiliary yawl establishes a world's record for yacht cruising among the islands off the Gulf of Carpentaria. Captain S. Spain (the mate), a member of The Royal Sydney Yacht Squadron, and The Royal Prince Alfred Yacht Club, narrates some interesting incidents which occurred during the five months' voyage.

For a 25-ton yawl-rigged yacht to make a cruise of between 5,000 and 6,000 miles under her own sail and auxiliary power, constitutes a yachting record for the world. This, however, is what the *Stormy*

Street, Sydney—has been full of interest and exciting adventures.

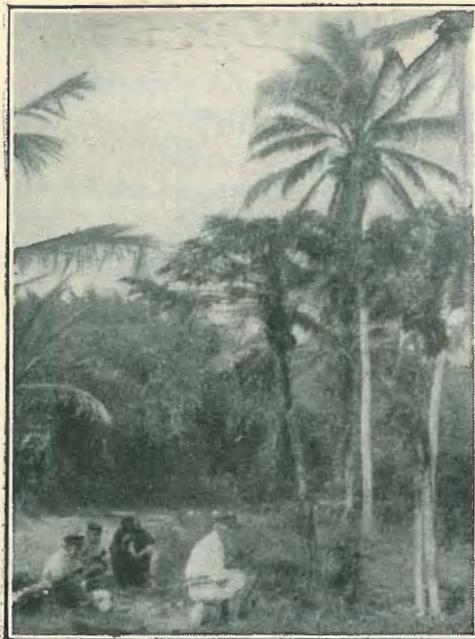
Mr. Dempster shipped as his crew Captain S. Spain, mate, Captain S. C. Hutchins, navigating officer, Mr. E. P. An-



Crew of the "Stormy Petrel."

Front Row: Captain S. M. Dempster (owner), Mr. T. W. Hodgson, Mr. E. P. Andreas, Captain S. C. Hutchins. Back Row: Mr. R. Old, Mairu, Captain S. Spain.

Petrel has accomplished between May 10 and October 11, and the trip—purely a pleasure one, made on behalf of her owner, Mr. Sidney M. Dempster, of the firm of Marshall and Dempster, of Pitt dreas, engineer, Mr. T. W. Hodgson and Mr. R. Old, and victualled his yacht in such a manner that she could do the trip out and back without—should the need arise—taking in fresh stores.



A Fruitarian Repast.
Pawpaw and Coconut at Darnley Island,
Torres Straits.

She left Sydney with two harness casks of pork and beef, tinned butter, biscuits, peas and beans, all the four latter in hermetically sealed tins; cocoa, tea and coffee, and two medicine chests (luckily neither of which had to be drawn on either out or home), 40 gallons of water and 94 gallons of benzine and kerosene. The *Stormy Petrol* was fitted out with electric light, including a searchlight (of which more anon) and, in case this means of lighting failed, an acetylene gas plant.

The cruise, though started as a pleasure one, proved hard work throughout, for she was up against it from the day she passed the Heads. It was heavy weather all the way. Working up the coast she was forced to shelter eight days in Salamander Bay, and off Smoky Cape she was hove-to under storm canvas for 15 hours with the engine going full speed and only just holding her own. From Cape Moreton she had to run to open sea for 50 miles—again under storm canvas—and it was then decided to take the deep-sea route instead of the Sandy Straits one as had been originally arranged. So for

four days and five nights she drove before the gale prior to gaining the entrance of the Great Barrier Reef, where things eased up. From that time she ran nearly 800 miles under a square sail, thanks to a favouring wind, and half the distance was covered without her having to drop a single sail.

It took the little craft 36 days to reach Thursday Island, which had been selected as the base for operations in the surrounding islands.

Interviewed by *Sea, Land and Air*, Captain Stanley Spain, late Chief Recruiting Officer in New South Wales, gave some interesting experiences of the doings of the yacht among the islands and their amphibious inhabitants.

"We were anchored one day," he said, "some ten miles off Red Point, in the Gulf of Carpentaria, when one of our native crew said he saw turtle. Overboard he went like a shot and a second native followed him with a line, but swimming under water. When they reached their victim they fought him for 40 minutes before they could get him on his back and make the line fast to one of his flippers. So big was the turtle that, when at last it was landed alongside, it took four of the crew to hoist it on deck.

"I should mention," continued the captain, "that at Thursday Island we shipped a Badu Islander named Mairu who could, as did all the other islanders we encountered, speak English fluently. He was our pilot throughout and came back with us to Sydney. The ordinary island natives



At Flinders Group, Torres Straits.
Native catamarans welcome the *Stormy Petrol*.

only know the waters in their own particular vicinity, and though we often shipped them to see us a part of the way, Mairu became a permanent institution.

"By the same token," said Captain Spain, "in all the principal islands round the Gulf, the Queensland Government has appointed English women as native teachers, with the result that the natives speak and write English beautifully. I saw copybooks up there among little-known islands that would put to shame the best produced by scholars in the public schools of our State capitals.

"Having got into the Gulf we realised that for the first time in our yachting experience we were sailing along on a southerly course with our port side to the land. It gave one quite a curious sensation, but nothing to the sensations we were to subsequently experience.

"For instance, one day we were out in the dinghy, having put off with the intention of going ashore for oysters. The tide was too high so we thought we would do some fishing. Then we remembered we had no bait. Mairu overheard our remarks and taking up a spear with two fine prongs soon had some garfish aboard, thanks to his keenness of eye and dexterity of hand. When I tell you that none of the garfish was more than four inches in length you can understand his skill.

"At Badu, in the Moa group, we went out turtle hunting one day in a cutter, but the water proved too muddy, so we started fishing. We anchored close to a reef and though we paid out plenty of chain we found the cutter was bumping in an ominous manner on the reef. Accordingly more chain was paid out and eventually we got on the far side of the reef in safety. But when we Sydney yachtsmen tried to heave the anchor we were stuck. We were on one side of the reef and it was in the coral trash somewhere on the other. This didn't worry our native crew to any extent. Two of them dived overboard, strolled along the bottom of the sea, pulled the anchor up and, with it in their arms, walked for three or four minutes (though to us it seemed half-an-hour) on the sea bed till they found we could heave it up clear.

"Whilst at the same place we badly wanted some turtle, but again found our-

selves without bait. The matter being explained to one of our dusky deck-hands he grinned, dropped over the side and a few moments later appeared with a live crayfish in his hands, which he had wrenched out of some crevice in the coral beneath us.

"We saw plenty of birds and plenty of fish and, speaking of the latter, there appeared to be only one of which the natives are really afraid, and that is the stone fish. This fish resembles a stone or the back of a freshly plucked goose, and to touch it means almost, if not instantaneous, death, as from the pores in the goose flesh it exudes a most malignant poison.

"Off Murray Island we found what one might call a huge belt of sardines; these kept close inshore out of the way of the big fish, which pen them in and feed on them at their leisure. It was here one of our native crew speared a ten-foot shark from the dinghy. He took the boys in the dinghy a royal race until finally exhausted and hauled on deck, and his tail at present is nailed on to the end of the *Stormy Petrel's* bowsprit.

"Another exciting form of fishing we found in trying to capture a sea cow. These huge brutes range up to a ton in weight and have hides two inches thick. When over one of them one day off Mobaia a native spearsman stood in the bow ready with his spear, which is backed with about ten feet of a very heavy native wood. This in itself is not sufficient to drive the weapon home, so the native jumps with his spear, throwing all his weight on it. To the spear is attached several yards of rope and an oil drum, and once the sea-cow, or *dugong*, has started off, half-a-dozen natives go over the side and, hanging on to the rope, put their weight on to it to exhaust the sea-cow. Being a mammal it must come to the surface to breathe, and if it is not dead when hauled alongside by the natives, who in the meantime have fixed a rope round its tail, it is held downwards in the water until life is extinct.

"You don't really know what a steak means until you have had a big, juicy one, two inches thick, cut from a sea-cow," reflected the captain, with an epicurean glint in his eyes. "Absolutely the most

delicious and succulent piece of red meat I have ever eaten."

While in the Gulf of Carpentaria the *Stormy Petrel* took a tour up the Batavia River, which was simply swarming with alligators. More than one was shot and two monsters were hauled on board with block and tackle and exhibited, whilst a baby one was stuffed and came back to Sydney hung in the yacht's cabin.

"Not only was there excitement on the trip," said Captain Spain, "but a sheen of romance was spread over it as well. It was this way. While in the Moa Group we found Warrant-Officer Jardine, son of Mr. Jardine, of Somerset, Alban Pass, recently returned from the front, who was about to marry Miss Duffy, of Brisbane. The wedding was celebrated in the cabin of the *Stormy Petrel*, Father Black performing the ceremony, and a settler of the far North, Mr. Virgin, gave the bride away. Mr. Dempster acted as best man, and the Wedding March was played on our gramophone. The bride and bridegroom were our guests on board to their new home, some 30 miles distant from where they were made man and wife.



Married in the "Stormy Petrel."
Bridal couple coming aboard at Thursday Island.

"Talking about shooting," continued Captain Spain, "you know, if a man goes out shooting within, say a hundred miles of Sydney and bags a Jack snipe, his feat is mentioned in the Press as something remarkable. Up where we have been Jack snipe were plentiful and it was no uncommon thing for the entire crew to sit down to eight apiece.

"At Jardine Swamps we shot a huge bird of the flamingo species. We have brought his legs back with us and they measure 3ft. 6in. in length, and are of a bright red colour. With his beak in the air he stood just on 12 ft.

"Earlier I mentioned that we carried a searchlight on our foremast, and though we thought it might be useful for navigating at night, we found, once we were in the coral islands, that the only safe course was to navigate by day and let the night—when no man can work—take care of itself, as we did by anchoring. On our arrival at Murray Island, the inhabitants prepared a real native dance for us, and while it was in progress someone on the yawl turned on this searchlight of ours. It was an instantaneous success. The natives went wild with delight and sent along a deputation to ask us to bring the 'one big sun' ashore that they might bask in its beams at closer range.

"Coming down the coast on our way home we met the *Australia* and the rest of the Australian fleet on its way to show the flag up North and we were having a pretty rocky time of it, our little craft being swept by mountainous seas. The flagship swung across our bows, thinking, perhaps, that we were in distress, but we showed them what Australians are made of by dipping our ensign to their lordly freeboard and asking to be reported 'all well!'

"And all-well we arrived in Sydney, not a single member of the crew having met with any accident after a most enjoyable five-months' trip in our *multum in parvo*.

THE HISTORY OF THE ABERDEEN LINE

UNDER SAIL AND STEAM

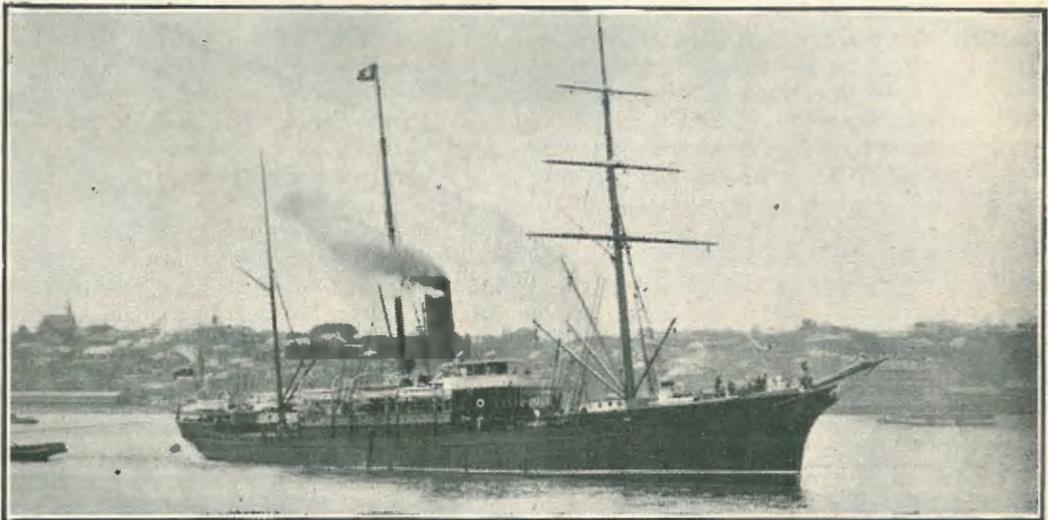
Especially Written for "Sea, Land and Air"

By CAPTAIN J. H. WATSON, J.P., F.R.A.H.S.

PART V.

The s.s. *Sophocles* which for some years maintained the prestige of the Aberdeen White Star was not built for that flag, but commenced her career as a Liverpool White Star liner, being built by Harland and Wolff, of Belfast, and launched in 1883 as the *Ionic*. When brought into her new service in 1894 she was an innovation, as with her straight stem and four masts she had quite a different appearance to the traditional clipper-build of the Aberdonians.

Napier & Sons, and is generally said to be a sister ship of the *Moravian*. In 1900 she took the New South Wales Naval Brigade to China, Captain A. H. H. Douglas having command of her at the time. The Brigade left Sydney in charge of its veteran commander, the late Captain Francis Hixson, but on arrival at Hong Kóng he handed it over to a younger officer, Lieutenant Gillespie, R.N., and returned to Sydney. This was not Captain Douglas' first experience in carrying troops, if the de-



The first Aberdeen Line Steamer, s.s. "Aberdeen."

But for some time she was not to become a model for future vessels, the old type being adhered to until the entry of the unfortunate *Pericles* as the forerunner of the new and modern Aberdeen liner.

The *Sophocles* was a great cargo carrier and did good work for some years; she was passed out in 1917. Captains Schlemann and McKillam had the handling of her, among others.

In 1899 the *Salamis* made her appearance, coming from the yard of Robert

description may be said to apply to blue-jackets, as he was in the *Australasian* when she took the Soudan Contingent to Egypt in 1885.

On her voyage home from Sydney in 1908, the *Salamis* experienced an unforeseen delay off Port Phillip Heads; she had arrived off the Schanck on Sunday evening March 29, and the engines were stopped preparatory to picking up the pilot. This done, the high-pressure cylinder came crashing down, causing a general collapse

of the whole machinery. Tugs were signalled for, and the vessel anchored for the night. Early the following morning two powerful tugs took her in tow to Hobson's Bay. This proved a costly accident as in addition to having to replace a 13-ton casting and effect repairs to the machinery at a cost of £3,000, the passengers and cargo had to be transhipped, involving a considerable loss, which was increased by the delay whilst the vessel was under repair. Twelve months later she was in the hands of the ship carpenters getting her accommodation altered to adapt her to the new conditions which had already been carried out with marked success in the *Moravian*. The conversion to a one-class had met with great approval, and the *Moravian* and *Salamis* were to put the Aberdeen Line on an equal footing with other lines—their competitors.

On a voyage to Melbourne and Sydney in 1910, under command of Captain Schlemann, with more than 200 passengers aboard, she reached the former port on July 2, four days overdue, a very unusual thing for a steamer, these running as a rule with such punctuality that on receipt of a cable from last port of departure her time can be calculated to a few hours; but even this is now improved, for since the introduction of wireless, which has to be installed on all passenger vessels, the message comes on to the agents, days before, "Shall arrive (such and such) an hour on (a named) day." So having been advised as leaving Cape Town and not turning up at the usual time great anxiety for her safety was felt. This was caused, as explained by Captain Schlemann, by encountering a hurricane when in 44 degrees south and 73 degrees east; the seas were terrific and tumbled aboard unceasingly, many passengers sustaining serious injuries, including, in some cases, fractured limbs. The vessel could make no headway and was tossed about like a cork. Bad weather with heavy thunderstorms was carried right up to near Capé Otway, and all on board were pleased to be inside Port Phillip Heads. It is not altogether fair to criticise the skipper, but 44 degrees south seems rather far down for a steamer in June. But all's well that ends well, and eleven head of pedigree cattle on board were landed in good condition.

During the following year the *Salamis*

was withdrawn from the Australian trade. She made her last trip under the White Star of Aberdeen at the end of 1910, being under the command of Captain Robb, who had in his charge 400 passengers for various Australian ports. The officers on this last trip were Mr. W. Jermyn, chief officer; second, Mr. James Poate; third, Mr. McLean; chief engineer, Mr. Watson; second, Mr. McPherson; and chief steward, Mr. McLeod.

On this last voyage out she was again four days late when she arrived at Melbourne on November 18, 1910—this time caused by delays at various ports of call and a breakdown in her machinery after leaving the Cape.

In 1912 she passed into the ownership of Messrs. Andrew Weir & Co., of Glasgow, a firm which since that date has had a large number of steamers under its flag. In the closing years of the last century they had several sailing vessels with the terminal syllable "bank" in their names, such as *Springbank*, *Thistlebank*, and *Olivebank*, and traded as the Bank Line. In 1903 the *Miltiades* was built at Glasgow by Alexander Stephens & Sons and launched on August 11, Lady Carrington, the wife of a former Governor of New South Wales, performing the christening ceremony. The *Miltiades* was of 6,800 tons and her length 475 feet, with a 55 foot beam. In appearance she was similar to other vessels of the line but ten years later, an expanding trade requiring larger vessels, her builders took her in hand and performed a surgical operation; she was cut in two, the parts drawn asunder and 50 feet additional built into her, thus making her length 525 feet, and increasing her tonnage to 8,000 tons. One mast was taken out and a second funnel put in, thus preserving her symmetrical appearance, and bringing her into line with ships of modern type. In 1910 the management decided to instal wireless telegraphy on all their vessels, and the *Miltiades* was the first to be fitted with the apparatus.

Another innovation was made at the same time; it was that each ship should be fitted with a submarine-signalling plant, which was stated to be a great convenience in waters where there are submarine signal stations for finding the position in foggy weather. Regarding wireless, there can be no doubt as to its value to the ship and the shipping community, but of the other the

public hear little, and even do not know if it is used.

Returning to the *Miltiades*; in 1903, Captain Spalding was in command on her first voyage, which was the quickest passage that had ever been made from Plymouth to Melbourne.

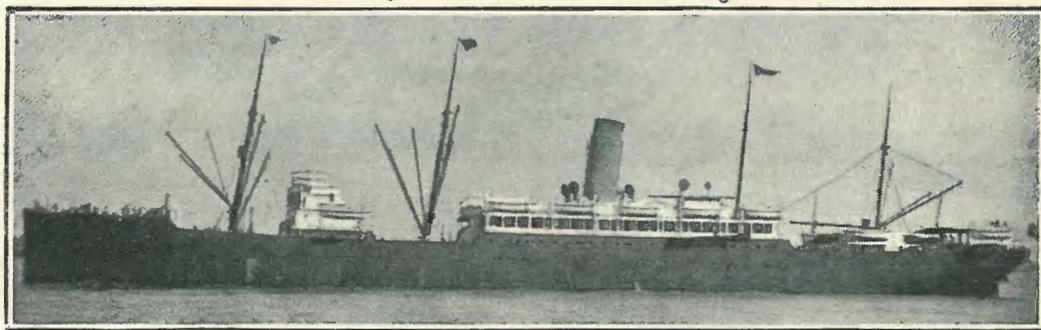
In August, 1907, on the homeward voyage, *viâ* Suez Canal and mailboat ports she landed the mails twenty-four hours ahead of schedule.

The *Marathon*, one of the exceptions of these steamers, in that her name was not a revival of that of a sailing ship, was built in the same yard in the same year (1903) as the *Miltiades* and, but for a few minor details, is a sister ship. She also, in 1912, underwent surgical treatment and had 50 feet let into her waist. On her first voyage she was commanded by Captain N. Allan, who had already passed 40

up-to-date modern liner to the fleet that sailed under the White Star of Aberdeen.

To get this ship the Irish Sea had to be crossed and the order placed with Messrs. Harland and Wolff, builders of the world's greatest ships. Mr. G. W. Wolff, M.P., relates that in their early days he and Mr. Harland proposed to open a ship-building yard in Liverpool, and were told by the harbour authorities that they were too young to start such an undertaking. Consequently Belfast got the works that now employs about 15,000 men.

The ship they built for the Aberdeen line in 1907 was the unfortunate *Pericles*, of 11,000 tons, and the first straight stem ship to be built for the line, the *Sophocles* being purchased from "outside." Like most of these steamships, the *Pericles* was named after an old sailing ship which had a great reputation as a sailer and was a



s.s. "Pericles," 11,000 tons, lost off Cape Leeuwin, March 31, 1910.

years in the Company's service. He had commenced as an apprentice in the sailing ship *Ethiopian*, and serving later in the *Thermopylae*, *Patriarch*, and *Aristides*, retained the command until 1908, when Captain Schlemann took it over, the latter being followed by Captain W. J. Burge and Captain Collins in 1910. After being lengthened she made her first voyage, with Captain Collins still in command, leaving Plymouth October 20, 1912.

Both the *Miltiades* and *Marathon* are still performing their share in the over-sea shipping of the Commonwealth and have been carrying troops during the war and since.

The infusion of new blood (drawn from other great shipping companies) into the directorate of the Aberdeen Line was responsible in 1907 for the addition of an

frequent visitor to Australian ports down to recent times, under Norwegian colours.

This splendid vessel was commanded by the commodore of the line, Captain Alexander Simpson, who had previously commanded the second steamer, the *Australasian*, which carried troops from Sydney to Egypt in 1885. When the *Pericles* entered Port Jackson in the early morning of August 24, 1908, the admiring gaze of all about the waterfront was directed towards her. Her description had preceded her, and, although critics are always to be found in abundance, everything said of the *Pericles* was in her favour. Her great beam and lofty position of the bridge and charthouse took the fancy of connoisseurs. She had a single funnel and four light spar masts, high and rakish enough to be reminiscent of E. J. Brady's lines:—

*There's a jaunty White Star Liner, and
her decks are scrubbed clean,
And her tall white spars are spotless, and
her hull is painted green.*

The advent of a steamer which marked a new era in the history of the Aberdeen Line was celebrated by a luncheon to which were invited Sydney's leading commercial and shipping men. On this occasion many nice things were said of the owners, the agents, and the Captain and officers—as was quite right and proper. Few captains had such a record as Alexander Simpson, commander of the *Pericles* and commodore of George Thompson & Co.'s fleet. Commencing his sea career in the *Queen of Nations* (the sailing ship which was lost off Wollongong in 1881, and of which he was afterwards second officer), he then went in the same capacity to the *Centurion* (No. 2), next to the *Samuel Plimsoll*, later becoming chief officer with a master's certificate, and in 1880 getting the command of her. When steam was recognised by the Aberdeen Line, Captain Simpson went to their first steamer, the *Aberdeen*, as chief officer, and when the second (the building of which he superintended) was launched he got the command. In her he made fourteen voyages, and carried the first troops which left Australia to assist the Mother Country.

His next command was the s.s. *Thermopylae*, which remained under his charge for fifteen voyages, he then transferred to the *Moravian* and made twenty-two voyages in her. It was on the completion of his last voyage that he was given charge of the *Pericles*, and at the luncheon referred to, after eulogising his officers, he added: "I have a very good ship, a very good billet, and I am going to keep them."

But after all, Captain Simpson was only human, and he could not see what futurity held in store for him, for within nine months, on March 31, 1910, the *Pericles*, his "very good ship," was at the bottom of the ocean, three miles direct south of Cape Leeuwin lighthouse. The loss of his "very good billet" evoked the sympathy of all sections of the community. He had made 80 voyages to and fro, and his objective was the century.

The worthy skipper has been described as fond of the bottle; this, it must be explained, was not in the bacchanalian

sense. He was no toper, but having a penchant for testing the currents of the ocean, was in the habit of daily throwing overboard a bottle containing a paper on which was given the date and position of the ship at the time, and asking that whoever might find one of these bottles would return the paper to him stating where and when located. Ocean meteorology, it will be seen, was Captain Simpson's hobby.

At the time the *Pericles* was lost, the rock (four fathoms deep) on which she struck was uncharted, although it was known there was one somewhere about the locality; thus her loss has been the means of practically protecting other large steamers from a similar fate. The details of this catastrophe need scarcely be recalled as it is of such recent date as to be within the memory of all. It may, however, be mentioned that there was no loss of life, although, including the crew, some 400 persons were on board. The estimated financial loss was £500,000, half of which amount represented the value of the cargo.

At that period the steamships of the Aberdeen Line were the *Moravian*, *Miltiades*, *Salamis*, *Marathon*, the fifth being the ill-fated *Pericles*. Although a new vessel was building, it was necessary, in order to keep to the time table, to replace the lost vessel at once. The vessel selected and chartered for the purpose was the *Norseman*, of 9,545 tons, built in 1897 by Harland and Wolff for the British and North Atlantic Steam Navigation Company, and very similar in appearance to the *Pericles*, being 500 feet long, with a beam of 62 feet. It was considered at the time a smart piece of work to select and fit out a vessel of her size for a trade and service very different from what she had been used to, and to get her away on June 7, barely two months after the loss of the *Pericles*.

The *Norseman* brought 460 passengers of the one class type, and so as to be ready to take her place in the time-table she came direct from Plymouth to Melbourne. She was commanded by Captain G. Berry, a stranger to Australian waters, but some of his officers were from ships of the Aberdeen Line, Mr. Ackerman, the purser, having filled the same position on the *Pericles*.

(To be Continued.)

THE USE OF THE KITE BALLOON IN THE NAVY

Especially Written for "Sea, Land and Air"

By CAPTAIN P. ROACH-PIERSON (Ex R.N.A.S.)

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Nowadays it is quite a common sight to see a battleship, cruiser or destroyer steaming into harbour with a kite balloon in tow, but it was not so in the early days of the war. Although on the Western front they had been in use for some considerable time, it was nearly two years after the commencement of hostilities that they were used to any extent by the Royal Navy.

The officer chiefly responsible for their adoption by the "Senior Service" was Lieutenant-Colonel (now Brigadier-General) E. M. Maitland, D.S.O., who was the first Commanding Officer of the Kite Balloon Experimental and Instructional Station at Roehampton, where he was ably assisted by Squadron Commander (now Lieutenant-Colonel) Harry Delacombe as his "Number One."

At Roehampton young officers were trained in the art of free ballooning, map reading, signalling, observation work, and kindred subjects, afterwards forming part of the personnel of kite-ballooning sections which were sent to France to co-operate with the Army.

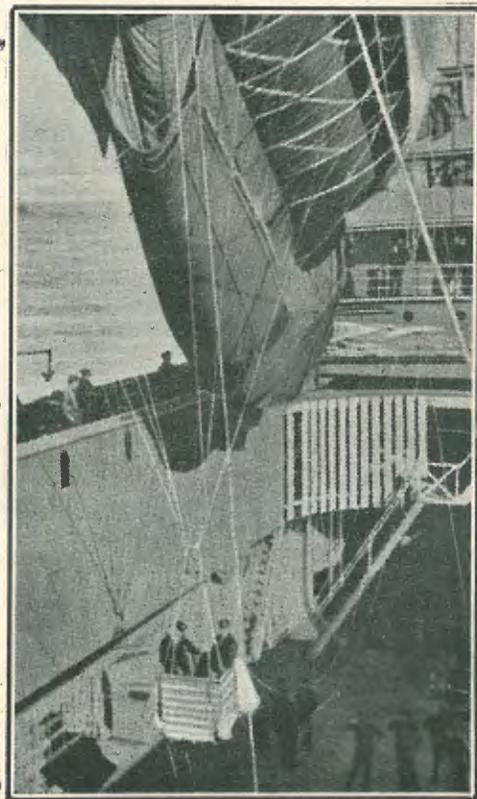
The possibilities of the kite-balloon as a purely naval weapon were appreciated, and two or three merchant ships were chartered by the Admiralty and specially converted as balloon carriers. The accompanying illustration shows the large hold of one of these vessels into which the balloon may be lowered without deflation. A silicon plant in the fore-end of the hold generates the hydrogen, afterwards compressed into tubes which are stowed on both sides of the ship.

Early in 1916 there were only two ships actually employed with the Grand Fleet carrying kite balloons. They were the *Menelaus* (late of the Alfred Holt Line) and the *Campania* (Cunard), the latter ship also carrying aeroplanes.

The *Menelaus* for a year past had been operating with the monitors which periodically bombarded the Belgian coast. Two balloon ships had also been used with excellent results off Gallipoli, but this was practically all stationary observation work.

The question now arose as to whether balloons could be actually flown from a battleship or destroyer whilst steaming at full speed. Hitherto they had been flown only from their parent ships, and never above a speed of about eight to ten knots.

It was decided to make the experiment, and on June 8, 1916, at Scapa Flow, the *Menelaus* made fast alongside H.M.S. *Benbow* (at that time the flagship of Admiral Sir F. Sturdee), to transfer her balloon to the battleship's quarter-deck. Captain Oliver Swan, R.N. (Wing Captain R.N.A.S.), took charge of operations, assisted by Flight Lieutenant T. Morris, R.N. (commanding the Balloon Section of H.M.S. *Menelaus*), the two pilots to make the ascent being the present writer and



Kite Balloon Ascending from Ship's Hold.

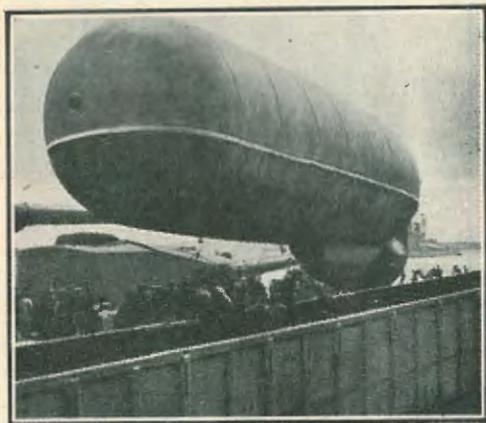
Flight Sub-Lieutenant C. A. Beck, R.N.

The first thing to be done in this evolution was to transfer the "Lanchester" winch from the balloon hold to the fore-end of the quarter-deck of the battleship. This was accomplished by swinging it out by one of the battleship's after derricks, and it was then securely clamped down. A snatch block was fixed to the *Benbow's* stern, through which the balloon cable was rove, in order to keep it well clear of the turrets.

A canvas screen had previously been erected across the deck, to prevent too strong a wind catching underneath the nose of the balloon and swinging it about, while the ship was under way.

The balloon was then carefully let up from the *Menelaus* hold by the handling guys until it was about 10 feet clear of the ship's bulwarks. Sandbags were attached all round to release the strain on the men holding her down.

At this position it was inclined to blow about a good deal and great care had to be taken that it did not catch in any deck gear or hit against the side of the ship, also to keep the rudder from fouling or getting torn.



Transshipping Balloon from H.M.S. "Menelaus" to H.M.S. "Benbow."

The starboard handling guys were then taken by ratings on deck, who passed them over the side to the men waiting on the battleship, while those below in the hold with the port guys walked the balloon bodily over until they could be taken by the men on deck. These in turn were passed over to the *Benbow* and the balloon

was then hauled down and securely "bagged down" on the quarter-deck.

The *Benbow* then got under way, and it was found necessary to have men at each bridle all the way round to keep the balloon in position. At one moment it seemed that nothing would prevent it from careering over the side, so great was the force of the wind.

After cruising round for a while with the balloon on deck, the ship was brought head to wind and stopped in order to let up the balloon.

The latter operation was performed in the usual way on the handling guys and the car attached. The two balloon officers, having taken their places in the car, the balloon was then let up on the winch to an altitude of 800 ft., and the ship again got under way.

The wind on deck was registered at 19-21 m.p.h., which the ship steamed against at a speed of 15 knots. The wind speed estimated in the balloon was 55 m.p.h.

After having been towed for about ten minutes, the parachute tails, with which the "Drachen" type of balloon was fitted for steadying purposes, carried away and one of the forward toggles in the rigging band broke in halves.

This was very disconcerting for the officers in the car, as the balloon now began to behave badly, and imposed a considerably greater strain on the cable.

A tension meter was applied to the cable on deck, and the strain was registered at $1\frac{1}{2}$ tons.

Owing to the manner in which the balloon was now swinging about accurate observations and spotting would have been impossible, but the telephone worked faultlessly, and communication between the balloon and the ship's bridge was maintained throughout the whole evolution.

The balloon now having been in the air for about 45 minutes, hauling down was commenced, but when at a height of some 300 feet the winch jambed, and for about half an hour the balloon remained at that altitude, during which time it swung and dived in an alarming manner.

As the winch stubbornly refused to haul down any further it was at length decided to complete the job by hand. This was accomplished with the assistance of about 100 of the *Benbow's* bluejackets, and after

a great deal of swinging and diving the balloon was safely bagged down on deck, much to the relief of the occupants of the car, who had received a thorough shaking up. While the balloon was on deck, the strain on the hauling guys was so great that three of them carried away.

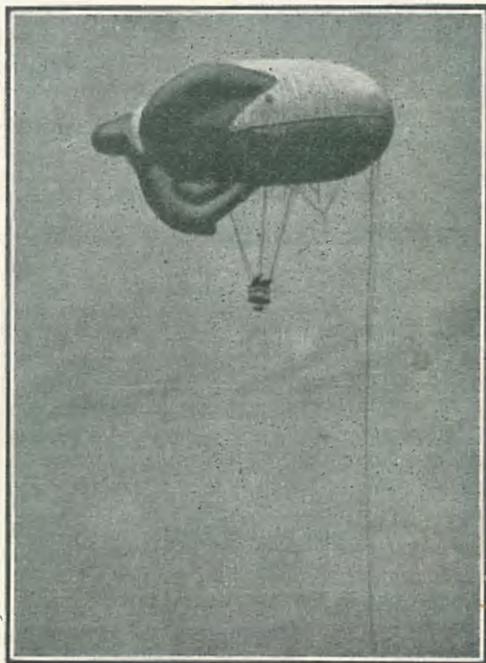
When the balloon was back in the hold of the *Menelaus* it was deflated and examined, and it was found that nearly all the panels had stretched considerably, proving that the balloon had been strained to its utmost—at the same time it must be borne in mind that it had already seen a year's hard service.

Although the experiment was not absolutely the success that might have been desired, it taught the kite balloon authorities many things. More experiments were carried out later with the new type of balloon, the "Caquot" (invented by Captain Caquot, of the French Army), and it was not long before at least one vessel in every flotilla carried a kite balloon.

In 1917 Lieutenant Butcher, D.S.O., whilst making observations from a balloon in tow of a destroyer, sighted a German submarine, and was able to direct the vessel so accurately by means of the telephone that a depth charge was successfully dropped, destroying the Hun.

Balloons have been particularly useful in convoy work. The German submarine

commander who dared to attack a convoy whilst one of the escorting destroyers was flying a balloon, was simply asking for trouble, for once the locality of a submarine is known to the navigator of a fast destroyer he is able to drop his depth charges with almost never-failing results.



"Caquot" Balloon (Type "M.")

THE TRANS-PACIFIC FLIGHT

CALIFORNIA TO AUSTRALIA

Rules and Regulations

The Contest Committee of the Aero Club of America have announced the following rules and regulations governing the Trans-Pacific Flight, for which Mr. Thomas H. Ince, of Venice, California, has offered a prize of £10,000 (\$50,000).

"Thomas H. Ince offers the sum of fifty thousand dollars to the aviator who shall first complete an aerial voyage across the Pacific Ocean in a heavier-than-air machine, mechanically propelled, of any size and type, said flight may be attempted from either side of the ocean. But if west-

ward the starting place must be from the Thomas H. Ince aviation field at Venice, California, or the Thomas H. Ince hydro-aeroplane station at Venice, California, and the finish must be on the mainland of Australia or the mainland of the Japanese group of islands or the mainland of the Philippine group of islands, or the Continent of Asia. If eastward, the starting place must be on the mainland of Australia or the mainland of the Japanese group of islands, or the mainland or the Philippine group of islands or the Continent of Asia,

and the finish must be on the mainland of H. Ince aviation field at Venice, California of said flight must be confined to latitudes 49 degrees north and 32 degrees 33 minutes south of the United States of America and latitudes 41 degrees 35 minutes 20 seconds north and 38 degrees 45 minutes south of the Eastern Pacific.

"The contest shall be conducted by the Aero Club of America, through its official affiliation and representative, the Pacific Aero Club, and shall comply with the rules and regulations of the Fédération Aéronautique Internationale.

"The contest shall be confined between the months of September, 1919, and February, 1920, inclusive, and contestants must complete the transpacific flight within 288 hours from the time of starting.

"In the event that no contestant shall successfully complete a transpacific flight, for which the sum of \$50,000 is offered, the contestant starting from the Thomas H. Ince aviation field at Venice, California, or the Thomas H. Ince hydroaeroplane station at Venice, California, who shall have reached the Hawaiian Islands in the shortest length of time, shall be awarded the sum of \$10,000, and in the event that no contestant shall complete a flight to the Hawaiian Islands, the contestant starting from either of the two above mentioned places who shall fly furthest in the direction of the Hawaiian Islands shall be awarded the sum of \$5,000.

"The contest is open to persons of any nationality holding an aviator's pilot license issued by any accredited aero club affiliated with the Fédération Aéronautique Internationale or to persons who have been so rated by any military or naval establishment.

"The entry form, which must be accompanied by the entrance fee of \$500, must be sent to the Secretary of the Pacific Aero

Club, Monadnock Building, San Francisco, California, at least fourteen days before the entrant makes his first attempt. No entrance fee will be required of any military or naval contestant. Foreign entries will make application to the clubs in their respective countries which are affiliated with the Fédération Aéronautique Internationale.

"No part of the entrance fees are to be received by Thomas H. Ince, all such entrance fees will be applied toward payment of the expenses of the Pacific Aero Club in conducting the contest. Any balance not so expended will be refunded to the contestants *pro rata*.

"The start of contestants may be made from land or water, but in the latter case, the contestant must cross the coast line at the beginning and end of flight. The time will be taken from the moment of leaving the land or crossing the coast line. Each contestant shall advise the Pacific Aero Club of the proposed date and time of his start, as all starts must be made under the supervision of an official of the above club.

Ninety-five per cent. of the mileage travelled from starting point to finish must be accomplished in the air. Barographs officially sealed shall be attached to each aircraft before starting, and opened in the presence of an accredited representative of the Pacific Aero Club."

* * * * *

Other rulings which were decided cover many points. Towing is not prohibited, and stops and landings may be made *en route*. Only one aircraft may be used for each attempt, although repairs during the journey are allowed. The finish may be made on land or water, the time taken at the moment of crossing the coast line or touching land. Each contestant shall make known his proposed destination and alighting place.

THE FLIGHT FROM ENGLAND TO AUSTRALIA

Will be fully dealt with in the
December issue of "Sea, Land and Air."

WHAT THE AIR SERVICE CAN DO FOR AUSTRALIA*

By MAJOR-GENERAL J. GORDON LEGGE, C.M.G., C.B.
(Chief of Commonwealth General Staff)

The Air Service has profoundly affected the conduct of war by land and sea, but it has been too short a time in existence for us to think that its use has reached full development, more especially as no nation in the Great War had on its battle fronts all the aircraft it desired or could use, and it is therefore a matter to some extent of speculation, what would be the effect produced by a great expansion of the service. The commercial use of aircraft is not so well developed, and in fact is now only receiving recognition and support in Europe and the United States of America. I will, therefore, put forward in this paper some suggestions, without attempting too great detail or too rigid demands, as food for thought and discussion, believing that the immense importance of air defence and air travel to Australia merits general consideration, as much as any of the most important questions of the day.

Why Air Service is Necessary.

The first objection we hear to the question of an Air Force, as to other forms of Defence, is the argument that the League of Nations will prevent war, and that national defence is no longer necessary. We all hope it will produce this effect, but it cannot be for many years. The best we can hope is a gradual reduction of armaments, and a growing habit of national self-restraint and willingness to submit to arbitration. War itself is "Direct Action," and until the world can practise in its internal affairs the decision of disputes by sane methods there is no hope for the rule of Peace Among Nations.

Nor will a state of "Unpreparedness," as advocated by International Brotherhoods, achieve the reign of peace. As well might we put a notice on our front gate, that we keep neither dog nor gun,

* A lecture delivered before The United Service Institution of Victoria, at the Town Hall, Melbourne, on October 22, 1919.

and hope that the casual burglar would read and pass elsewhere. Unpreparedness may certainly cause us to have no war by accepting unresistingly the insults, the aggression, or the conquest, of an alien race. The unpreparedness of Great Britain and the United States of America did not prevent their taking part in the Great War. It did prevent their being able to produce any decisive effort for over twelve months after they began.

Peace, so devoutly hoped for, is not yet. What the nations think may be gauged, in part, by their preparation for war in the air.

Great Britain has fixed an establishment of 6,000 officers and 79,000 other ranks for her Permanent Air Force, and talks of a Reserve as well. In proportion we should have 600 officers and 8,000 other ranks.

America proposes to maintain 45 field squadrons, 42 coast defence squadrons, and 42 balloon companies. Five thousand planes are to be maintained. Their permanent personnel, excluding large reserve units, is to be 2,000 officers and 22,000 other ranks.

Japan has already spent large sums and is now spending lavishly. She is using planes against the head-hunters of Formosa; possesses over 400 planes, imported from France, England, and America, and will have 600 by the end of the year. Pilots are being trained at the rate of 100 a course, and £1,000,000 is being expended on the aircraft sections of the arsenals, which are turning out 200 planes this year.

I do not propose to touch on the question of oversea operations, nor upon the special requirements of the Navy. The settled policy of Australia up to now has been the maintenance of a force for Home Defence only, leaving the question of oversea operations to be settled on a voluntary basis when the occasion arises. I believe, however, that the 300,000 Aus-

tralians who have so lately seen real war are firmly of opinion that, if Australia is ever compelled to fight again, it is better for us to see it through *outside* of Australia.

Leaving, however, that question, we find that in comparison with other nations our unpreparedness is appalling. The Australian air would be a gift to any invader, and a safe place from which to wipe out our defenders and destroy our cities.

Is it realised that, if command of the sea were lost, the available troops of Australia could barely in a year be moved from East to West, and that some parts of Australia could not be reached at all?

Is it realised that during the past war the capital cities of Australia were at the mercy of German bombs, if the raider had seen fit? At that time we had not an anti-aircraft gun or fighting plane.

Is it realised that our young soldiers will be a bloody sacrifice to our neglect, when the enemy holds the air, and that our cities will burn and our women and children be mangled—the victims of our unpreparedness?

I propose to divide my subject into the separate examination of (1) the general capacity and proved usefulness of aircraft, (2) the special application of such powers to Australian conditions, (3) what is the minimum requirement in aircraft for our defence, and (4) the cost.

What Aircraft Can Do.

During the war there has been a marvellous development of aircraft, but all for fighting duty. Much of this development is of service towards the attainment of aircraft suitable for commercial purposes, but there is much still to be done. It is important therefore, before we apply investigation to Australian conditions, to visualise briefly what aircraft can do now, omitting exceptional performances of a freak character. What military planes have done is pretty generally known and need not be retold here. I will therefore briefly set out what commercial machines can do, deferring, for the present, the close relationship between military and civil aircraft.

Passenger planes, no longer experimental, can fly at a normal economical speed of 80 to 100 miles per hour, they can carry over 30 passengers, or 25 fully

equipped soldiers, and many have a radius of well over 1,000 miles without landing. The *Fiat* biplane, whose useful load is $1\frac{1}{2}$ tons, has covered 362 miles at 161 miles per hour.

A *Vimy* biplane has crossed the Atlantic, 1960 miles, in 16 hours, under very adverse conditions. Such great non-stop flights are impossible as a regular thing, in view of the great part of the carrying capacity which has to be allotted to fuel and oil.

A rigid airship, the *R. 34*, has travelled 3,500 miles on a non-stop flight with a personnel of over 20. Larger airships with a carrying capacity of 60 passengers are possible and contemplated.

With standardised machines and suitable aerodromes or flying fields the risk is so small that insurance companies in Great Britain issue a policy of £500 at 2s. 6d. for short trips, which shows that the odds are calculated at about 10,000 to 1 against serious accident.

In regular air-mail services the U.S.A. are easily first. Since May 15 the Post Office has been running a large number of planes, *De Havilland* with Liberty engines, on air routes between Washington, New York, Cleveland, and Chicago—and with complete success. The average loads were only about 300 pounds of mail matter, the average speed 100 miles per hour, and the regularity of the service excellent. Careful statistical records were kept, which show that, after adding to running expenses and wages, all overhead charges, interest and depreciation, the cost was barely 3s. per mile. If such be the cost of working a service of comparatively low carrying capacity, how much less should be mileage rate of a service of large planes.

Mr. Handley Page, in 1918, had worked out the costs of running his large two-engined planes, and announced that a 600 h.p. machine could carry six passengers and 3,500 lbs. of mail matter at 1s. per lb. per 800 miles. This works out at $2\frac{1}{4}$ d. per mile per passenger, little over what is charged in Australia for first-class passengers. Letters would be under 1d. per oz. for the 800 miles.

The great Handley Page machine V/1,500 has since been produced, which has four engines, carries 1,000 gallons of fuel, and can remain in the air for 14

hours at a speed of 95 to 103 miles per hour. Its useful load is then 7,000 lbs., more if less fuel be carried.

Use for Aircraft in Australia.

Australia is 2,000 miles from East to West and 1,500 miles from North to South. A distance of 500 miles or more separates the capital cities. Large areas are still many hundreds of miles from any railway. In the effort to facilitate the transit of outback traffic to the coast there have been constructed many spur railways, which do not pay either their running expenses or interest on cost. Parts of Central Australia, fit for occupation and possessing mineral resources, can only obtain goods by camel team, at a transit cost of £50 a ton and over, the rate being from 2s. to 3s. per ton a mile. What a country for the aeroplane to conquer, for it can traverse these distances at less cost!

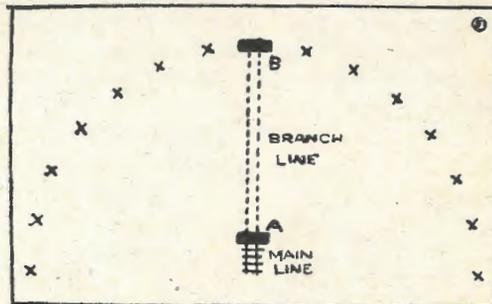
Lord Weir in his lecture at Newcastle on July 10, 1919, stated that: "In all considerations for the future of civil aviation, the two qualities of outstanding merit appertaining to the new form of transport are *speed* and *independence of action*, as against land transport requiring roads or rails. Early action should be taken—especially in new countries backward in rail development."

Sydney is five days from Perth by rail, and the cost of transit and expenses to a first-class passenger amounts to about £20. Yet the distance in a direct line can be performed by large planes in two daylight flights, and later on will be achieved within 24 hours by night flying. Many passengers would be willing to pay £25, (or 3d. per mile), for the saving of time, and this will be sufficient to provide large profits to well organised companies. I do not pretend that small planes or even large planes, if few in number, can run at a profit with such rates, for the overhead charges of management, landing places, hangars and workshops would be great. It is by the organisation of large companies, flying many planes, and with a capital of about half a million pounds, that low rates can be made payable.

Mails can similarly be carried by air at a cost little or not at all exceeding that now in force, and save two days between Perth and Melbourne, three to Sydney, four to Brisbane, and, later, one day more.

This means that for letter and reply Sydney is brought one week nearer to London.

From many sources I am convinced too, that not only passengers and mail matter, but much ordinary freight can be carried by air at a cost no greater than that of the many non-paying country railways. These often barely pay running expenses and nothing towards interest on the construction loans, amounting to an even larger annual cost. Passengers and goods conveyed by these lines cost, therefore, to the country *double* the nominal railway charges. A great deal of such traffic could be carried by plane at no higher cost, and it would be cheaper in the long run, because a non-paying air route can be moved elsewhere with little loss as compared with a railway. An air route can also take up and deliver at the farmer's door instead of at fixed points miles away.



General Legge's Diagram.

Thus (referring to above diagram) freight from A, the commencement of a branch line, can be delivered to not only B at the end of the line, but to any place right or left of the line within an angle of 90 degrees to each side. The air route from A to B, therefore, replaces, not only the railway, but also an indefinite number of other routes.

It is probably not generally known that large sums have been spent in Australia on railways partially or wholly constructed and afterwards abandoned. In Victoria £750,000 has thus been lost, and, in addition there are 54 lines running less than a train a day.

In another State, New South Wales, 2,800 miles of railway are being run at a loss, the earnings being £1,000,000, and the costs, plus interest on capital, £600,000 higher.

I have taken an instance, not by any means the worst, on which to base a calculation. A country line, 80 miles long, earns £13,000 annually, resulting in a loss of £14,000. The passengers numbered 6,700, the goods 8,000 tons, and wool 26,000 bales.

If the air charges could be set at 2½d. per passenger-mile, and 1s. per ton-mile for freight, the total charge would be less than the £27,000 per annum which they cost the public and the Government together. And further, passengers and freight could have been delivered, not on the railway, but at their own doors. The rate of 1s. per ton-mile is, I fully believe, quite possible on regular runs with full loads.

Smaller planes are relatively more expensive, except those piloted by their owners, but will nevertheless be capable of much useful work for the squatter, doctor and commercial traveller in the back country, also for rough survey work and even for exact work in combination with some trigonometrical survey. With the aid of planes, prospecting and the opening up of new country in Central Australia cease to be impracticable.

Aircraft Needed.

What Air Forces we shall need time alone will make evident. Apart, however, from the special requirements of our Navy, it is clear that there is a minimum below which we cannot place our needs, for the existing conditions of war amply show the urgent necessity of at least 16 squadrons of 25 planes each, and two flying boat squadrons, these machines being of the scouting and fighting type, quite distinct from commercial planes and constructed purely for military use.

Of these, five squadrons of air planes, bombs we need at least 200 of 4-ton useful ready for use, and mostly manned by permanent personnel. The remainder could be manned by Militia personnel, but with sufficient training to enable them to be called out at short notice. Full fighting equipment with motor transport and workshops must always be ready, for the Air Service represents our most advanced troops, and will be the first to meet the enemy.

Nothing less than these will serve, and possibly more may be required.

So far I have mentioned only machines

of an exclusively combatant type. In addition there are required a large number of planes for other work, especially the duty of bombing and possibly carriage of troops. If these can be provided from the aircraft in civil use, as we may hope, large additional expense will be avoided. Otherwise they also must be provided, and in any case their special fittings must be stored ready for use.

Of air planes suitable for passengers or bombs we need at least 200 of 4-ton useful load capacity, or their equivalent in smaller craft. Too large a number of such commercial aircraft we cannot have.

To those who would charge me with exaggerated demands, I would point out that Australia's population is one-tenth of that of Great Britain, and that, if we maintained that proportion of what Great Britain had in hand at the end of the war, we should have, not the 600 above proposed, but over 2,000 planes and 4,000 engines.

Behind the fighting units we must have a Training School and an Arsenal.

The Training School, quite distinct from the fighting units, must in peace train pilots and mechanics, and afford refresher courses to the Militia pilots and airmen; in war it must be capable of greatly increased output.

Last, but most important, comes that section of the Australian Arsenal which shall produce planes and engines. If wars lasted only three months we might hope to worry through on the equipment stocked in peace time, but wars last longer, and in war time you can get no military stores from abroad, even if you are fortunate enough to retain command of the sea. This we have learned by experience.

So important is the subject of the Arsenal that I am almost tempted to say that without it we had better make no longer a pretence of self-defence. By arsenal is not meant one magnificent and costly establishment, but a combined institution of Government and private factories and shops whose output shall cover all that we need in munitions.

There are many things not yet made in Australia, either at all or in sufficient quantities, that are essential for war. Such are petrol, aluminium, special steels

and alloys, linen fabric, field guns, shells, and aeroplane engines and fittings.

There is no show of safety in our defence unless we are self-contained and can produce all we need.

As an example I might quote the case of the United States of America which, 18 months after its entry into the war, had its troops equipped almost wholly with French and British equipment, and although it had manufactured fighting planes, of which 600 had reached France, none of them were on November 11, 1918, in the fighting line, and this notwithstanding the long opportunity to make ready.

That, with an Air Force such as I have outlined, added to the Citizen Military Forces of the Commonwealth, Australia will be able to defend its shores continuously and successfully, I do not assert, for our population is at present too small to maintain a force of sufficient strength; but it can be safely asserted that, with such a force, a defence can be put up, which will necessitate some delay in an enemy's attack, and require of him considerable preparation, giving us the six months necessary in which help might be expected from oversea.

The Cost.

The construction of aerodromes near our capital cities and at other strategical points, to equip the squadrons advocated, and to establish the arsenal, exercising the greatest economy, and dispensing with much that is desirable in order to obtain what is essential, will require a capital expenditure of £1,500,000.

The annual cost must include:—

- Pay of personnel.
- Consumable stores—Petrol, oil, timber, fabric, metals, etc.
- Water, light, etc.
- Wireless and meteorological service.
- Maintenance, replacement, and additions to aerodromes and equipment.
- Subsidies for reserve aircraft.
- Control of civil aviation.
- Incidentals.

And will amount to about £1,000,000 per annum.

Such expenditure can give us an Air Force of about 600 aircraft, of which 400 will be purely military, and 200 civil subsidised craft.

The personnel should consist of about 2,000 permanently employed, and 5,000 members of the Citizen Forces.

Behind them will stand the producing capacity and personnel of the School and the Arsenal.

This is little enough with which to defend a continent having a coast line of 8,000 miles, and with vulnerable points, Perth and Sydney, 2,000 miles apart, with two foreign nations holding territory less than 500 miles from our shores, four within 1,000 miles, and five within 2,000 miles, all within the range of a non-stop flight of aircraft.

While defence is looked upon as a spending and not a producing or earning department of government, it is often overlooked that there are direct and indirect returns which reduce the unproductiveness of the expenditure. Consideration will show this to be even more so with the cost of an air service.

In the annual expenditure is included the control of civil aviation, a duty which the Commonwealth has engaged to undertake as a member of the League of Nations, and which would otherwise have to be paid for by another department.

Subsidies to passenger-carrying aircraft enrolled in the Reserve are also not unproductive. They will enable the owners of such craft to undertake transport for the public at lower fares and freights, and thus operate in a similar manner to the State subsidy of non-paying railways and, by the extension of such services, render unnecessary the construction of lines until there is sufficient traffic to justify them.

All air stations will assist meteorology by their observations, at low and high levels, thus improving the means at the disposal of the Meteorological Department.

Nor will even the permanent personnel of the Australian Air Force be a mere spending body. So far as their special training in fighting work goes it is true that they will be unproductive, although, like all defence forces, a necessary insurance.

This branch of the Defence Force can, however, combine much useful duty with the practice of their profession.

The entry of planes from abroad is a possible avenue for smuggling; offenders against the law can more easily escape by air than by slower means of travel; air pirates and other criminals may attempt concealment by a means which leaves no track behind it; all these possible activities may be handled by the fighting planes. Their duty it should also be to chart new air routes, patrol our unfrequented coasts and carry mails to forlorn outposts, to make rough photographic surveys of the large unmapped areas, to fill in similarly with accurate work the country and coasts which have been but dotted in by the trigonometrical survey, to report on unoccupied areas, convey Government officials on geological, survey, and forestry duties, and assist in prospecting the hidden wealth of the so-called deserts.

Last, and not least, the School and the squadrons of the Permanent Air Force will be the school and the university of the expert flyers and mechanics of the civil flying profession in Australia.

In no branch of defence will there be so little unproductive expenditure.

General Considerations.

There are many other considerations and questions which I have not been able to include appropriately under the foregoing headings, but all of which deserve thought.

It has been stated that Australia's requirements in planes fit to carry passengers or bombs, should be 200 of a type having a 4-ton useful load and a radius of 1,000 miles. For these there is ample employment in Australia, in the carriage of passengers, mails and freight. *Every inducement should be offered by the Post Office in view of the importance of this class of aircraft, and it would pay the country to devote £200,000 annually to additional subsidies of such types, rather than be compelled to purchase them for purely defence purposes.*

Let it not be forgotten that such planes in time of war can, if need be, transport troops as well as civilian passengers, and that 200 four-engined Handley Page machines could move across 1,000 miles in one week the personnel and food of a whole division, and in one month a whole

Army Corps. It is true that troops have not been moved by air in war, but the possibility should be borne in mind.

Has it occurred to you that four foreign nations have jumping-off places within 1,000 miles of the Australian mainland, that is, within reach of air travel, and that Australia may be invaded as well as defended by way of the air?

Since the armistice there has been a general slacking off apparent to all. There is a tendency to rely on past victories and experience gained, and to let serious thought for defence go hang. Past victories will not defend us, nor war experience that is even now growing dulled day by day. Any returned officer of experience will tell you that to gather up the old A.I.F., to reorganise units, and do the necessary refresher training, would take at least three months, and then we should have to wait until their equipment arrives from the places oversea where it is in store, because we have not the necessary stores built or hired here. What show would Australia have in a dispute now?

Its Militia is far below establishment, and practically untrained and unfit for war also.

Australia has one equipped flying ground where it should have 10 to 12; it has 30-odd teaching planes where it should have these *and* 400 fighting planes; it has no big bombers where it should have 200; it has 100 permanent pilots and mechanics where it should have 2,000. It is true we have a small portion of our requirements ready for shipment in England, but no hangars to put them in when they arrive.

This morning's daily papers afford some "horrible examples." Dealing with Lord Jellicoe's proposals it is said:—

For the present Lord Jellicoe's report cannot be carried into effect, although it will be a valuable guide for the future.

And—

Therefore no immediate action can follow Lord Jellicoe's report.

Why this remarkable unanimity in opposing journals? I cannot imagine a conference, but I do see that both journals have the common quality of belonging to rich men, and that journals, like business men, who have had the fortune to make money out of the war, foresee that ade-

quate defence means expense, and expense means taxation, and it is wealth that will have to bear it.

The unwealthy voter sees it too.

This has been the result not of apathy and slackness alone, but of the reckless demand for economy. There are two sorts of economy, that which spends wisely and that which refuses to spend at all—most unwisely. If Great Britain had not been afflicted with the latter weakness, and had spent one-tenth of its loss in the Great War in making adequate preparation, there would have either been no Great War, or it would have lasted less than 12 months.

So, too, there are two sorts of business men.

We have had the happy experience of class co-operation with business men, who realised the first sort of economy, who were not afraid to spend, provided the country got what it wanted. But there have been too many of the other class of business men pouring on us the vials of their wrath per medium of Royal Commissions. I have heard of the reports of at least two such bodies, yet I neither saw nor had any communication with either. This seems strange when we remember that the Defence Department is not organised for a monthly turnover of rags, or quicker if possible, and a profit of never less than 25 per cent. The business of the Department is to organise and train soldiers, and organisation and training for war is the work of my own particular branch. Yet these all-knowing people, of their own innate ability, say we do not know our job, and gaily advise no training this year, without making any inquiry of the responsible officers whose work they belittle.

The Business Commission were scandalised at the stupidity of the Defence Department in having during one period of the war a stock of one million military boots. This was due to the holding up of shipping by submarines. War necessitates holding some stocks, and we cannot send customers round to the next retailer when we run out. Yet within a few months of the criticism we were ordering further supplies. This ignorant abuse received much publicity and drew the usual remarks from the Press. No one advertised the real truth.

Again the Economy Commission expects "that the efforts of the League of Nations will operate in the direction of minimising the risk of war," a pretty safe but vague prediction on which to base definite action. We do not expect a fire, therefore why insure? It recommends a mark-time policy, no Training, no Arsenal, no Air Service, throwing out of employment most of our factory hands who produce such shocking examples of low prices in their output. It may be good business—for some of the business people in the trade—not for Australia. These self-sufficient advisers who know so little as to refer to "uncontrolled expenditure," when the Treasury, and the Audit, and the Paymaster, see that no one else draws cheques, how would they shape if the insurance business man took on a soft-goods house, and the manager of the latter were transferred to a harvester works, would they not be as likely to succeed as a business man preparing for our next war? And to afford another example of the horrible incompetency of "munitions" in the U.S.A.?

The wonder is that they have not scented the great saving to be accomplished by paying, say, half the Defence Vote to Chile or Siam to guard us, and so save the rest by doing without a Home Force.

In their search after petty errors that should be discovered by the ordinary process of inspection and audit, and in their blindness to big questions, they bring to my mind the story of the monkey, so busy searching for fleas, that he did not notice the approach of the tiger.

Another most important factor in preparation for Defence is Time, a factor not unknown in the conduct of business. It is a popular fallacy that if you get so many men, put them into uniform, give them guns, and teach them to salute and march past, you have an army. Yet this is the easiest part of the work of preparation, and takes least time. The more important subjects are often left till later, reversing the proper order of creation.

An arsenal cannot be got going for two years after expenditure is authorised. The building and equipment of aerodromes require over a year.

Pilots can be trained in six months.

Infantry soldiers in three months.

Already we are a year or more behind other nations in the preparation of an Air Service. If we begin to-morrow with an arsenal, flying fields, hangars, workshops, and barracks for the men, we shall be two, three, or more years behind them. Yet much may happen in those years that we shall never recover, and the world's peace was never so uncertain as now.

The future Air Service of Australia seems to be nobody's child, and, while the Navy and the Army are striving to obtain the means to attain their aims, the air above Australia is free to the hostile airmen, showering maybe in the future, bullets, bombs, and poison gas upon our helpless people. I do not say that airmen can replace the Armies or the Fleets, but I will strongly assert that it is incumbent on us to take a broad view of their relative values, and see whether much that is now the duty of sea and land cannot better be performed in the air. Has it ever struck you that no gun can throw its explosive as far as a plane can take and drop it? Do you understand that a battleship costs as much as many hundred planes, requires the same personnel to man it, and costs the same annually? Yet for many purposes I believe that the cost of a battleship would achieve greater destruction to an enemy if devoted to bombing and fighting machines.

No one can accuse me of being opposed to expenditure on the Navy. Twelve years ago I believe I was the only officer at Headquarters who supported Captain Creswell (now Admiral Sir William Creswell) in his efforts to get the foundations of the Navy laid. The Navy are right to claim fully what they think necessary, so is the Army, and so is the Air Service. All that is desirable is, however, not possible, and the country must make up its mind as to the relative importance of the claims or nothing will be done. There appears to me, however, one unsound argument used in favour of a large Eastern fleet to defend Australia. For England there is no doubt that a large fleet, for home defence primarily, but also for trade routes, is essential. England cannot feed herself, and great bulks of foodstuffs must be collected from great distances.

Australia, on the other hand, does not

need foodstuffs from abroad, also it already manufactures much that it requires, and could manufacture all if it set out to do it. Australia could be self-contained if it would, and no longer needs the sea.

Let those who want our foodstuffs come and get them. I do not say that this argument cannot be pushed into an absurdity by taking it to extremes, but there is food for thought in it.

Whatever the decision, however, the *air must be held*. You can be attacked and perhaps invaded by air, and neither Navy nor Army can stop it, but only an Air Force.

Lastly, I have something to say of our Australian Flying Corps at the front. Many died there, and the rest of these gallant boys have now returned home, in love with their work, and eager to continue in the Air Service of their own homeland. Regretfully we have to say, "we have no work for you," and Australia seems to have forgotten them. Surely not!

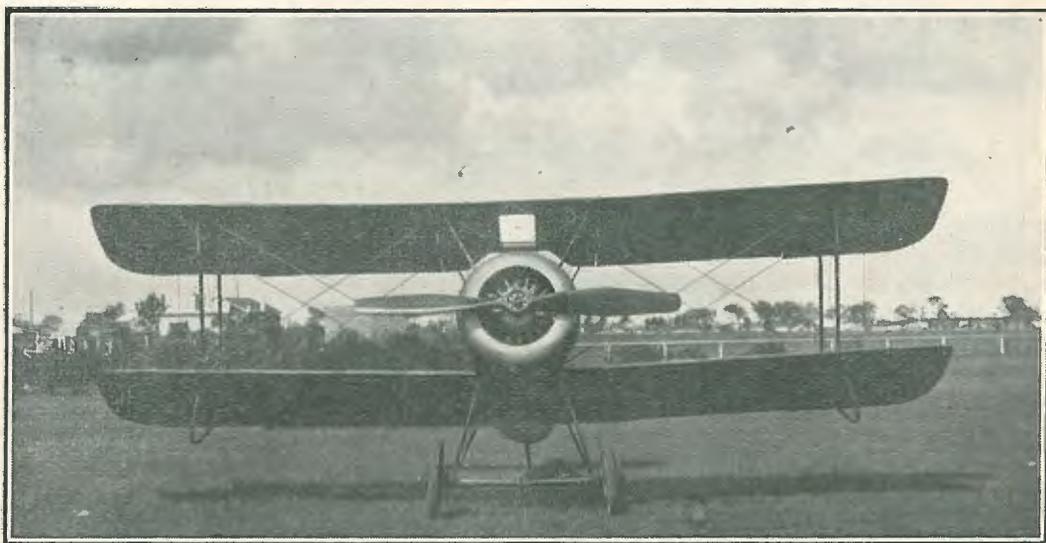
The British Army had 5,000 fighting and bombing planes on the various battlefronts when the war ended, and the official record gave them 8,000 enemy planes brought down. Your own airmen had 100 of those planes, and brought down 460 enemy planes out of the 8,000 as their share. Where the whole British Air Service did so well, can you wonder that our Australian Flying Corps achieved an imperishable fame?

Are you, the people of Australia, going to let them forget their glory, and lose all their invaluable experience, and then, some day, commence a new Air Force with raw beginners?

It is up to us and all the rest of the thinking men of this country to plead that some consideration be shown them, to plead for the means by which we may preserve the deadly skill that terrorised the Hun, to plead for an Air Force, without which there is no safety for our country.

* * * *

General Legge, at the conclusion of his lecture, announced to his audience that arrangements had been made for its publication *verbatim*, in *Sea, Land and Air*, Australia's officially recognised aeronautical journal.



THE SOPWITH "DOVE."

The aeroplane illustrated above arrived in the "Melbourne" Aerodrome, Glenhuntley, Vic., on October 15, and is the first of a shipment consigned from England to the Larkin-Sopwith Aviation Co. of Australasia Ltd. On October 19, before a large number of spectators, the "Dove" was tested by Captain A. W. Vigers, M.C., D.F.C., and Captain H. J. Larkin, D.F.C. The machine was rolled, spun, stalled and looped by both pilots. This is the smallest aeroplane at present in Australia, having a wing-span of only 24ft. 6in. It is fitted with an 80 Le Rhone engine and an adjustable tail-plane. The "Dove" is a two-seater, and its pilots claim that it is remarkably easy to land and could be flown by a lady.

On October 25 Captain Larkin flew his new machine over the crowds at Henley Regatta, Melbourne. The "Dove" was brightly illuminated, and at night presented an attractive appearance. On October 31 Captain Vigers will fly it to Warrnambool.

PEACE-LOAN FLYING IN QUEENSLAND

Especially Written for "Sea, Land and Air" by CAPT. E. R. B. PIKE
(Publicity Officer, Queensland Central Peace Loan Committee)

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Australian aviation is controlled from the South, and the controlling powers have long overlooked not only Queensland's interest in the solution of the flying problem, but also the fact that our * vast spaces of territory up North offer unique opportunities for commercial aviation.

With the launching of the Peace Loan we at last received that which had so often been requested—the visit of a modern aeroplane to our Northern State.

The officer selected by the Defence Department to conduct the flight was Cap-

* An article on "Commercial Aviation—Its Importance to Queensland and the Northern Belt," appeared in the November, 1918, issue of *Sea, Land and Air*.—Ed.

tain Francis R. Smith, of Toowoomba (Q.) who, like most successful flyers, has achieved distinction while yet in his early twenties. He won his M.C. in the infantry and, transferring into the Australian Flying Corps, soon rose to the rank of Flight Commander in No. 2 Squadron, his services being acknowledged by the award of the Distinguished Flying Cross.

The machine is a two-seater *Avro* biplane, fitted with an 80 h.p. 9-cylinder, rotary Le Rhone engine. Captain Smith inspected his aerial steed at the Central Flying School, Laverton (Victoria), but was not permitted to fly it up to Brisbane. If aeroplanes possess souls this one must have suffered the tortures of the eternally damned during its funereal



Peace Loan Flying in Queensland.
Captain Francis R. Smith, M.C., ready for the air.



The Peace Loan "Avro" at Kedron Park Racecourse, Queensland.

journey on the Queensland State Railways.

From Brisbane it was taken on to Lytton and assembled.

The opening exhibition was given on September 6, at Kedron Park Racecourse, and while the "bumpy" nature of the atmosphere somewhat restricted the performance, the stunts were sufficiently daring to impress a large audience.

The *Avro's* first misfortune was due to the action of a horse, an action which may have been inspired either by love or by hate. Despite all efforts of the military guard, this quadruped succeeded in nibbling away a portion of canvas wing-covering. By some the theory has been advanced that the liquid celluloid with which the wings are doped (to render them weatherproof) is irresistible to the equine palate. The alternative theory is that the animal sought to avenge the loss of his unfortunate brother in Victoria, which, as readers of *Sea, Land and Air* will remember—had died of fright a few weeks previously when another Peace Loan flyer, Captain L. H. Holden, landed in the paddock at Wangaratta.

On September 9, repairs being effected, Captain Smith left the capital at 10 a.m., carrying a plentiful supply of Peace Loan literature and accompanied by Air-Mechanic E. C. Campbell, a Brisbane boy.

In a strong westerly wind he landed safely at Toowoomba, the journey of 80 miles occupying about 2½ hours. His townsfolk gave the Loan a big lift. Re-

suming his flight at 3.15 p.m. he covered the 65 miles to Warwick in exactly 65 minutes.

After spending the night at Warwick he departed at 11.15 a.m. on September 10 for Stanhope (40 miles) which he reached in about half-an-hour, and thence to Boonah (80 miles) arriving at 3.45 p.m. Here a slight accident delayed him until the following morning (September 11). Leaving at 10 a.m. he reached Beaudesert (30 miles) in 35 minutes, but at the last-named town the rough ground selected for his descent damaged the undercarriage when the airman made his landing.

It was found possible to repair the aeroplane with parts of a Ford automobile—yet another tribute to that much abused vehicle!

The airman next gave an exhibition over the city of Brisbane, and executed a farewell loop above the *Orsova* as she steamed down the river, carrying, among other passengers, Mr. Denison Miller, governor of the Commonwealth Bank of Australia, to whom a Peace Loan message was dropped. Some excellent aerial photographs were secured and a number of ladies and gentlemen given their first joy-ride.

Meanwhile the new undercarriage had arrived from Melbourne and a start on a northern tour was made on September 17, at 10 a.m. Captain Smith's passenger being the chairman of directors of the *Courier Newspaper Co., Ltd.*, Mr. J. J.

Knight, who is closely associated with the formation of the Queensland Section of The Australian Aero Club. A 70-minute flight brought them to Nambour (60 miles), where a meeting was addressed. In landing at Nambour it was found that the ground was absolutely unsuitable. The same applied in the case of the landing ground at Gympie (which was reached shortly before 1 p.m.), this being surrounded by extremely tall timber.

After lunch at Gympie, Captain Smith—now rejoined by his mechanic—again took off. He slackened the engine on account of the shortness of the "run" available, and in rising from the ground his machine just touch the tall trees. By clearing another big tree directly ahead the pilot was able to avert total disaster, but the left plane became entangled and the *Avro* remained suspended in the tree until its occupants were assisted down.

As the damage to plane and propeller could not be repaired in Queensland, the *Avro* was exhibited outside the General Post Office, Brisbane, the fuselage serving as a rostrum from which Captain Smith and other speakers delivered Peace Loan addresses.

The experience, although unfortunate, is not entirely without value; besides assisting the Loan, it has clearly proved the necessity for careful selection of landing grounds. The trouble, in every case, was due to the desire of local residents to have the aeroplane land as close as possible to their own doorsteps, while ignoring the more important consideration of safety to pilot, mechanic and machine.

With a live Aero Club, represented by a body of practical men keenly alive to the possibilities, it is hoped that civil aviation in Queensland will very shortly become an established institution.



Victorian Peace Loan Flyers.

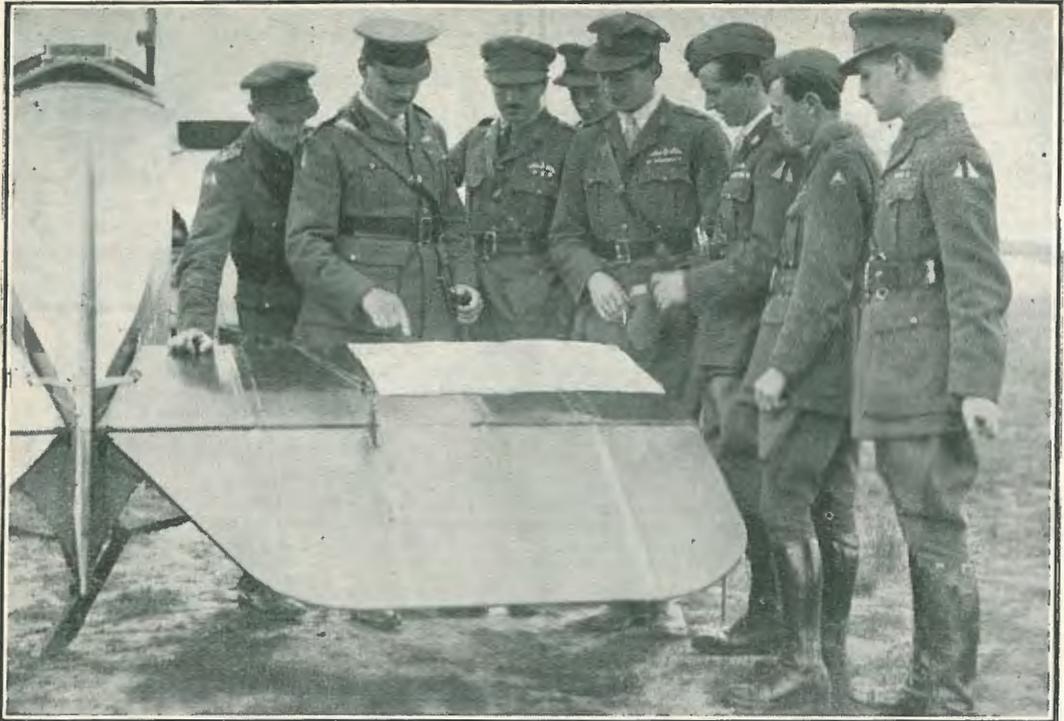
Left to Right: Captain A. H. Cobby, D.S.O., D.F.C.; Captain W. V. Herbert; Captain A. T. Cole, M.C., D.F.C.; Captain F. H. McNamara, V.C.; Lieut. F. G. Huxley, M.C.

PEACE LOAN FLYING IN VICTORIA.

Official Itinerary.

The following is the official itinerary of flights made in Victoria in connection with Peace Loan propaganda, in which six officers of the Australian Flying Corps participated.

Pilot.	Type of Machine.	Type of Engine.	Itinerary.			
Captain W. V. Herbert, A.F.C.	Avro	80 Le Rhone	Sept. 3: Laverton, Winchelsea, Colac.			
			Sept. 4: Camperdown, Warrnambool.			
			Sept. 5: Port Fairy, Casterton.			
			Sept. 6: Coleraine, Hamilton.			
Captain A. T. Cole, M.C., D.F.C.	Avro	80 Le Rhone	Sept. 7: Mortlake.			
			Sept. 8: Lismore, Cressy, Winchelsea, Laverton. (450 miles.)			
			Sept. 3: Laverton, Melton, Bacchus Marsh, Buninyong, Ballarat.			
			Sept. 4: Beaufort, Ararat.			
			Sept. 5: Rupanyip, Murtoa.			
			Sept. 6: Horsham, Dimboola.			
			Sept. 7: Nhill, Warracknabeal.			
			Sept. 8: Minyip, Donald.			
			Sept. 9: St. Arnaud, Avoca.			
			Sept. 10: Ballarat, Laverton. (500 miles.)			
Captain F. H. McNamara, V.C.	Avro	80 Le Rhone	Sept. 5: Laverton, Bendigo.			
			Sept. 6: Elmore, Rochester.			
			Sept. 7: Moama, Echuca.			
			Sept. 8: Kerang, Swan Hill.			
			Sept. 9: Sea Lake.			
			Sept. 10: Ouyen, Mildura:			
			Sept. 11: Ouyen.			
			Sept. 12: Sea Lake, Wycheproof, Charlton,			
			Sept. 13: Wedderburn, Marong, Bendigo.			
			Sept. 14: Bendigo, Laverton. (700 miles.)			
			Sept. 4: Laverton, Kyneton, Daylesford.			
			Sept. 5: Creswick, Clunes, Maryborough.			
			Sept. 6: Kyneton, Kilmore.			
			Sept. 7: Lilydale, Dandenong.			
Sept. 8: Frankston, Mornington.						
Sept. 9: Sorrento, Queenscliff, Portarlington, Laverton. (350 miles.)						
Lieutenant F. G. Huxley, M.C.	Avro	80 Le Rhone	Sept. 6: Laverton, Seymour, Benalla.			
			Sept. 7: Glenrowan, Oxley, Wangaratta.			
			Sept. 8: Bright, Beechworth.			
			Sept. 9: Tallangatta, Wodonga.			
			Sept. 10: Rutherglen, Yarrawonga.			
			Sept. 11: Numurkah, Nathalia.			
			Sept. 12: Shepparton, Murchiston.			
			Sept. 13: Rushworth, Nagambie.			
			Sept. 14: Seymour, Laverton. (560 miles.)			
			Captain Matheson	B.E. 2E.	100 R.A.F.	Sept. 4: Laverton, Berwick, Bunyip.
						Sept. 5: Warragul, Taralgon.
						Sept. 6: Sale.
						Sept. 8: Maffra, Bairnsdale.
						Sept. 9: Orbost, Sale.
Sept. 10: Bunyip, Laverton. (460 miles.)						



Colonel Cass (Director of Military Art), discusses air routes with the Victorian Peace Loan Flyers at the Central Flying School, Laverton.

Peace Loan Literature
for Aerial Distribution.



PEACE LOAN FLYING NEW SOUTH WALES, SOUTH AUSTRALIA AND TASMANIA

Peace Loan flights in New South Wales were made by Captain Leslie H. Holden, M.C., A.F.C., Captain Gordon C. Wilson, M.C., A.F.C., D.C.M., and Captain G. F. Malley, M.C., A.F.C. The last named, flying an Aero (80 Le Rhone), covered the following route: Blacktown, Rooty Hill, Mount Druitt, St. Mary's, Penrith and Wollongong. Captain Wilson, in a Sopwith Pup (80 Le Rhone), flew from Richmond to Bathurst on September 17, returning eight days later on completion of a tour which included Blayney, Carcoar, Orange, Molong, Cumnock, Wellington, Mudgee, Gulgong, Dubbo, Narromine, Peak Hill, Parkes, Grenfell, Cowra and Young. Captain Holden's itinerary is described in his official report which we print on the succeeding page.

In South Australia Captain Harry G. Butler, A.F.C., flew his Bristol monoplane (100 Le Rhone) from Adelaide to Two Wells, calling *en route*, at Kadina, Wallaroo, Moonta, Port Wakefield, Virginia and intermediate districts.

In Tasmania Peace Loan flights were made by Captain E. Cummings, D.F.C., and Lieutenant Long.

PEACE LOAN FLYING IN NEW SOUTH WALES

OFFICIAL REPORT ON LANDING GROUNDS

By Captain LESLIE H. HOLDEN, M.C., A.F.C.

Leaving Sydney (Richmond Aerodrome) we made N.E. to strike the coast about Tuggerah Lakes. When about 6 miles N.E. of Richmond the engine started to miss in one cylinder, and would not clear, so we landed in a field adjoining a road. We fitted a new plug and started again, this time only to get about another 10 miles before another plug went. The country here was impossible to land in, so we steered due east to the coast, passing over Bobbin Head and the upper reaches of Cowan Creek until we came out near Scott's Hotel at Newport. We had the beach at Newport in mind for landing, as there was no other place nearer unless we made back towards Sydney. We landed the machine on a small piece of land not far from Newport Beach, and fitted another plug.

We made another start, having a good deal of trouble to get going, owing to the short run. We had to go between a palm tree and a house, but we managed, and climbed into the wind over the sea. We reached 1000 feet and then went straight along the coast north towards Newcastle, passing over the heads of Broken Bay. No possible landing ground was sighted until we came within sight of Newcastle, unless the racecourse at Wyong were used as an emergency. A landing, could possibly be made at odd clearings near the railway line, or on the beaches along the coast, but unless a higher powered machine than the 80 h.p. Avro were used it would be impossible to get off again. We made a landing on the Broadmeadow show ground south of Newcastle, which is quite unsuitable for a landing ground for any machine. The racecourse would be better, but owing to its oblong shape, and a pool of water in the middle, it would only be useful north and south. There are a few other fields a little out of the town, easily discernible from 500 feet, which could be used in an emergency.

We left Newcastle at 11.50 a.m. We were due at Maitland at midday, and after flying round the town for a few minutes we headed west along the river, following the railway line. The country for about 12 miles is quite suitable and flat for landing, but just before Maitland is reached there is a small belt of wooded country for about three or four miles. Round East and West Maitland there are plenty of suitable fields for landing, but as was pre-arranged, we landed in the show ground at West Maitland. The ground is surrounded by trees and is "L" shaped. It lies slightly to the west of the town and is quite suitable for a slow landing machine, but owing to the bad approach it would be difficult to land a fast machine there.

After the meeting in connection with the Peace Loan we had lunch with the Mayor of Maitland and returned to the ground at 2.30. At 2.40 we set off for Singleton.

During the lunch hour a strong westerly breeze had sprung up and battling against this made us a good deal late getting to Singleton. The country between Maitland and Singleton is good along the railway line, and especially the river flats, which offer every facility for landing.

The country for about five miles before arriving at Singleton is very flat and open and there is a very large field adjoining the railway line as Singleton is approached from Maitland. This field lies to the east of the town and is about a quarter of a mile from the railway station, and as there are no trees surrounding it and only a telegraph line and a railway line on the eastern side it would be an ideal place for a landing ground.

The place selected by the Mayor was Howe Park, but this would not be suitable, as it would be much too small. We were supposed to leave for Muswellbrook at 3 p.m., but owing to a breakage of an exhaust valve spring we were unable to proceed until the following morning. Next morning we left the ground at 9.30 and made our way towards Muswellbrook. After leaving Singleton the country becomes very wooded, and tends to slope upwards. A few good landing places could be found about 10 miles from Singleton along the railway line, adjoining the river, but nothing between Singleton and Muswellbrook would be of any practical use. About six miles from Muswellbrook we had to cross a range of hills before dropping down to Muswellbrook on the other side. The town of Muswellbrook itself is slightly in a hollow, and there are plenty of good fields on the far side of the town approaching it from Singleton. This was pointed out to the Mayor when we landed in the park, and he was asked why one of the fields mentioned had not been selected in preference to the park, which was rather an awkward place to get into owing to being behind the hills and surrounded with trees. The surface is also unsuitable, as it is very uneven. We had a lot of engine trouble at Muswellbrook before we finally got started for Scone, owing to plug trouble. We put it down to the castor oil which we put in being too thin and running through the engine.

From Muswellbrook to Scone there are any amount of splendid landing fields on either side of the railway line, and as we approached the town we landed on the first field adjoining it on the left side of the railway line, which was quite suitable for our machine.

From Scone we proceeded to Murrurundi, following the railway line. From Scone to the

foot of the hills where the town of Wingen is situated there are a number of excellent fields on either side of the railway line, but the ground rapidly rises at Wingen, and we followed up the valley, turning to the left to Murrurundi. There are plenty of open spaces on these hills where landing could be made, and we landed on Mr. Abbott's estate, "Murralla," with engine trouble just before reaching Murrurundi. Found that the engine was getting very hot; we had to turn on a bit more oil, and after allowing the engine to cool, proceeded to Murrurundi.

From Wingen to Murrurundi it was necessary to climb about 1000 feet in order to get over the hills, and there is a bit of rough country from two miles out of Wingen until four miles from Murrurundi. Here, however, there are several good fields, and we made a landing on the first large field on the right of the main road going into Murrurundi. The crowd were waiting for us in the park on the side of a hill, but owing to its being full of stump holes and stumps, we disappointed them by landing in another field. We addressed the meeting at Murrurundi, and at about 5 p.m. flew back to Wingen and landed in Mr. Abbott's grounds behind the house, where we housed the machine for the night.

Next morning we had a working bee and cleaned the machine with hot water and soap, and at 9.50 a.m. we set off again, and arrived at Murrurundi about 10 o'clock. Mrs. Hayden and some friends had morning tea waiting for us here. After filling up with petrol and oil we proceeded on our journey at 11.30 a.m. to Quirindi. We had to climb steadily round and round the valley before being able to get over the Liverpool Range, but we managed to clear it at last and set off along the railway line towards Quirindi. When we reached the town of Willow Tree, about 20 miles from Murrurundi, we had trouble with the engine again, and were obliged to land in a field to the south of the town. The country along the valley from Willow Tree to Quirindi is quite suitable for landing when the hills are cleared beyond the Liverpool Range. We put a new plug in at Willow Tree and started again for Quirindi. We landed in the polo ground to the right of the town. This ground has a very good surface, but is a trifle small for landing, and is not suitable owing to trees in one corner and a shed. The racecourse, however, which is quite close could be used instead, except in wet weather when it would be too soft.

Leaving Quirindi we set out towards Tamworth and followed the railway line from Quirindi to Werris Creek. The country along the railway line from Quirindi to Tamworth is quite suitable anywhere for landing, except at Currabubula, where it is necessary to cross a range, but this is only for two miles, and can easily be got over from 4000 feet. We arrived at Tamworth at 4 o'clock and made a landing in the racecourse, which is an excellent landing ground, and entirely suitable for any type of machine, as it has an excellent approach.

We stayed the night at Tamworth, and at 12 o'clock the next day, after filling up with petrol and oil, and flying over the town dis-

tributing Peace Loan leaflets, made out due east along the railway line to Walcha Road station.

The country for the first 15 miles or so after leaving Tamworth, and following the railway line, is fairly open and clear, and plenty of landing grounds could be selected. Just as the railway line commences to enter the Moonbi Ranges to climb on to the New England Plateau, the country becomes exceedingly rough and rugged, and no suitable landing grounds could be found anywhere until we landed at Walcha on the golf links. We followed the road from Walcha Road station to Walcha, and there were one or two small cleared fields not far from Walcha Road station, on the road to Walcha, which could be used as landing grounds, but only in an emergency. The Walcha golf links, which is a common some two miles to the south-west of the town, is very suitable for landing, except that it has a slight rise to the south-west, but suitable places could quite easily be picked out before landing. There are several other good fields close to the town, but this one would be quite suitable for almost any machine, as it is not surrounded by a fence, and is open to the road. The field in which we had a forced landing later on is just a short distance from this place, and is also quite good, and there would be no difficulty in selecting a field on this side of Walcha. We stopped here for lunch and after more barracking for the Peace Loan, proceeded to Uralla at 2.30 p.m.

The altitude of Walcha is 3200 feet, and with our small powered machine, we experienced some difficulty in getting off, although a strong wind was blowing. We had not gone more than half a mile when one cylinder cut out, and we were lucky in finding a field, about two miles from where we started, in which to land. We landed here, and the crowd, thinking we had had a smash, immediately rushed out in motor cars and on bicycles until they found us. After fitting a new plug we started once more, following the main road from Walcha to Uralla.

For about a distance of 14 miles along the road after leaving Walcha there are no fields at all which could be used as landing grounds until the country has been cleared, but after that, on the left and also on the right of the main road there are plenty of good fields and open country called the Salisbury Plains. The country again becomes unsuitable after about seven or eight miles of this cleared cultivated land, and at Uralla no landing place could be found, so we decided to go on to Armidale.

The country between Uralla and Armidale has not many facilities for landing, but at Armidale there is a splendid site at the racecourse, where any machine could be landed without difficulty. This lies to the east of the town, and is easily discernible from a few hundred feet, and the grandstands do not interfere with the landing.

After leaving Armidale we climbed steadily in the direction of the railway line, which winds round to the south of the town, slowly climbing over the next plateau to the town of Guyra. If a fast climbing machine were used it would be quite possible to get height im-

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mediately after leaving Armidale and to go straight over the mountains behind the town, but as we took some time to get our height we followed the railway line through the hills and our altimeter was registering 5000 feet when we sighted Guyra.

There is no possible landing ground between Armidale and Guyra, except for a few small fields to each side of the line, which could perhaps be used with a slow landing machine, but which are no good for practical use.

The town of Guyra lies on the highest plateau of the New England Range, and is about 4600 feet above sea level. There is a very good landing place on what is called the Lagoon on the left of the town approaching from the Armidale side, easily discernible from any height. The surface is of black soil; it is rather rough at present owing to having been used for grazing cattle, round the edges there are strips of turf 200 to 300 yards wide and a spot could easily be picked out on which to land.

We left Guyra about 12 o'clock and flew towards Ben Lomond, following the railway line. From Guyra to Ben Lomond the country rises gradually to the west and culminates in the mountain of Ben Lomond itself. There are a few cultivated fields on each side of the railway line, but nothing of any practical use until the railway line drops again abruptly on to the plain which sweeps out towards Glen Innes. It would be about 10 miles after leaving Ben Lomond before any good landing fields could be found, and the country from here into Glen Innes is fairly well cultivated and there are plenty of places suitable for landing.

At Glen Innes we landed in a field on the left of the town, about three-quarters of a mile from the railway station, but it was not very suitable owing to its being too small; the racecourse could be used, but there are coursing fences and posts on it which would be dangerous. To the north of the town there are one or two large fields adjoining the railway line, which would be more suitable than the one in which we landed.

After leaving Glen Innes the country is flat for about eight miles when it gets very hilly and timbered. The railway line here winds through the hills and drops again 600 or 700 feet to another plain which sweeps out for a distance of about 28 or 30 miles. The country here is quite flat but there are not a great many clear fields except about 14 miles out of Glen Innes to the west of the railway line and about three miles in, where there is a large piece of open country, which would be suitable for landing purposes, but as it is some distance away from any sort of settlement it is perhaps not practicable.

The first town of any size along this line from Glen Innes is Deepwater, and we landed almost in the town on a very unsuitable piece of ground. We noticed a more suitable piece on the north-western side of the town adjoining the bank of the Deepwater River.

From Deepwater to the range of mountains which separates Deepwater from Bolivia Siding, the country is still flat, but there are no suitable fields for landing. It is necessary to climb about 1000 feet after leaving Deepwater

in order to clear the range which runs east and west across the railway line. The range does not extend into hilly country on either side but drops abruptly into flat country again, and we landed in a large field immediately beyond the mountains, which was quite suitable, except that it had a small outcrop of rock in one corner, which is easily discernible from the air. This field is on the left of the railway line going towards Tenterfield and is very close to a large red roofed house adjoining a creek about a mile from the railway line. On a windy day the air in this field is very rough and the downward currents are very trying, especially with a slow machine. It would only be advisable to use this field in cases of emergency. Immediately after this flat country the ground again rises, and the railway line gradually winds its way through very hilly country until it reaches another tableland where lies the town of Tenterfield. About eight miles from Tenterfield the ground is hilly, but it gradually gets flat round Tenterfield itself, and there are quite a number of good fields which could be selected from the air; we chose one a mile to the east of the town, and had a good landing. We also noticed some fields to the north-west of Tenterfield which would have been quite suitable.

From Tenterfield we turned and came back again to Glen Innes, where we fitted a new engine to our machine and set out due west for Inverell.

Immediately after leaving Glen Innes the ground rises slowly for about five miles to a height of about 500 feet, after which it gradually drops away into a wide plain. If the main road from Inverell to Glen Innes is followed there are quite a few decent fields to be seen.

On King's Plains, which lie well to the north of this road, there is a lot of open country which could be utilised. All the way into Inverell the country is hilly, but it drops gradually the whole time, and around Inverell it is very difficult to find a suitable place to land. We at length alighted on the racecourse, which is quite unsuitable in its present condition, as there are a number of trees around it and stumps in the centre, also other obstacles. If it were cleared a little it could be made into a very decent landing ground as there is plenty of room and it is fairly flat.

After leaving Inverell we climbed steadily again to get over the rise behind the town and crossed a lot of undulating country on the way to Warialda. The country has a tendency to slope to the west, and along the railway line the ground was open and clear and there would be no difficulty experienced in landing until within ten miles of Warialda, where scrubby country is again encountered after leaving the railway line and following the road which goes into Warialda.

Warialda lies in a hollow between two hills; we did not land at the intended spot, as it was quite unsuitable, being the recreation ground. We landed in a field on the right side of the main road from Bingarra to Warialda, about one mile from the town, which was devoid of obstacles and had a good approach from every side except the east, from which side it was

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necessary to land over the brow of the hill. The main road joins this field.

From Warialda we made straight towards Bingarra, which lies due south. Immediately after leaving Warialda the road crosses the railway line and continues on skirting the range of hills all the way to Bingarra, which lies on the bank of the River Gwydyr just before it cuts through the hills. The racecourse would be an excellent spot to land on, except for a windmill and few trees in the centre, but we managed to pick a spot as the surface was very smooth.

The country around Bingarra is very flat, and after leaving this town we climbed steadily north-west towards Moree, skirting a spur of the range of mountains, which ends about 12 miles north-west of Bingarra. The country again drops slightly here and sweeps out into the broad plains of the west. We again struck the railway line, between Gravesend and Baniguy, and followed it right into Moree. The country here is quite flat and a landing could be effected anywhere where the ground has been cultivated.

At Moree we landed on the west of the town on a piece of land adjoining the railway line, which would have been quite suitable except that the drought had cracked the ground until large fissures six inches or seven inches wide ran in all directions. There is a telegraph line running to the east of this piece of land and care must be taken in this direction, there are also one or two trees dotted about, but they could easily be avoided. Around Moree there are any amount of flat pieces of ground on which to make an aerodrome of any size desirable.

Following the railway line from Moree to Narrabri the country still continues flat, and

for the first twenty miles after leaving Moree it is clear on either side. After this for about ten miles there is a patch which has not been cleared until Bellata is reached.

After leaving Bellata the country is again cleared, and on the whole it is quite possible to land anywhere, along this line.

We landed at Narrabri to the north-west of the town on a triangular shaped piece of ground adjoining the railway line just before the station. There are plenty of better fields a little further out of the town, but as the crowd was waiting here we did not like to disappoint them.

From Narrabri to Boggabri the country rises slightly and is not as open as the country from Moree to Narrabri, but there are plenty of fields and the ground is all more or less under cultivation. We landed at the south-eastern side of the town on a strip of ground which was rather small for our purpose.

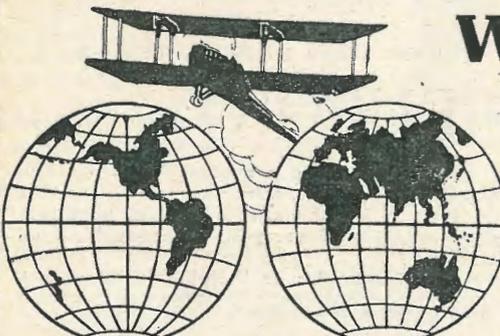
A little out of Boggabri there are plenty of large fields which could be used for landing, and the country between Boggabri and Gunnedah is quite flat again, but rises slightly a few miles out of Gunnedah.

At Gunnedah we could not find a field suitable for our purpose near the town and landed south of same in a large field, which was not as smooth as we could have desired. The showground could be used, except that the approach is very bad.

From Gunnedah we cut across country, passing over Carroll and Somerton *en route* back to Tamworth, where we landed on the racecourse. We crossed a range of mountains half way; except for this the country is quite flat and well cultivated, and could be utilised anywhere for aeroplanes.



Sopwith "Pups" at Laverton, lined up for start of Peace Loan Flight.



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THE AUSTRALIAN AERO CLUB

Victorian Section.

A committee meeting, attended by Major W. J. Sheldon (president), Captain P. Roach-Pierson, Lieutenant R. B. Oakes, Lieutenant Tunbridge and Mr. Hector Sleeman, was held in Melbourne on October 23.

Captain Roach-Pierson was elected to fill the vacancy on the committee, resulting from the recent departure to England of Major Lee Murray.

Mr. Hector Sleeman tendered his resignation of the office of honorary secretary of the Victorian Section, and Captain Roach-Pierson was elected as his successor. Mr. Sleeman will retain the office of honorary general secretary.

The question of club premises was discussed and the new honorary secretary was instructed to report on this matter at the next general meeting.

It was further resolved that His Majesty King George V. be invited to become Patron of the Australian Aero Club, and that active steps be taken to obtain permission to prefix the title "Royal."

South Australian Section.

A general meeting was held in Adelaide on October 9.

The chairman, Mr. Dudley T. Angas, referring to correspondence on the subject of control, stated that the Commonwealth Government clearly recognised its importance and necessity; he further expressed belief that the authority for which the Club had applied would be granted in view of the fact that its members included experienced men of the highest grade in the aeronautical world.

Letters were read from Captain H. J. Larkin, D.F.C. (general manager of The Larkin-Sopwith Aviation Company of Australasia, Limited) accepting on behalf of Captain G. C. Matthews, A.F.C., the Club's invitation to visit South Australia on completing his flight from England. A similar invitation to Flight-Lieutenant Pickles, R.N.A.S., was also accepted.

A vacancy on the committee, caused by the departure from South Australia of

Captain Manuel, was filled by Mr. A. V. Hancock, regret being expressed at the loss of the retiring office-bearer.

Comment was made regarding the return of Captain E. F. Pflaum, A.F.C., who, under instructions from the Department of Defence, had recently proceeded to Melbourne to take over a machine in which he was to fly back to Adelaide and assist the Peace Loan by aerial exhibitions in South Australia. This officer, it was said, had been offered a "decrepit old *D.H.-6*, of obsolete design," and—one speaker contended—"apart from the extreme doubt as to whether it would outlast the trip, the impossibility of safely performing stunts on it should have influenced the Department into offering something better to a pilot of Captain Pflaum's experience." It was understood, the speaker continued, that two *Avros* were allotted to New South Wales, and three *Avros* and three Sopwith *Pups* to Victoria—in the circumstances one of the latter should have been released to South Australia.

Members warmly commended Captain Pflaum's action in refusing to fly the machine offered, and in returning to Adelaide by rail.

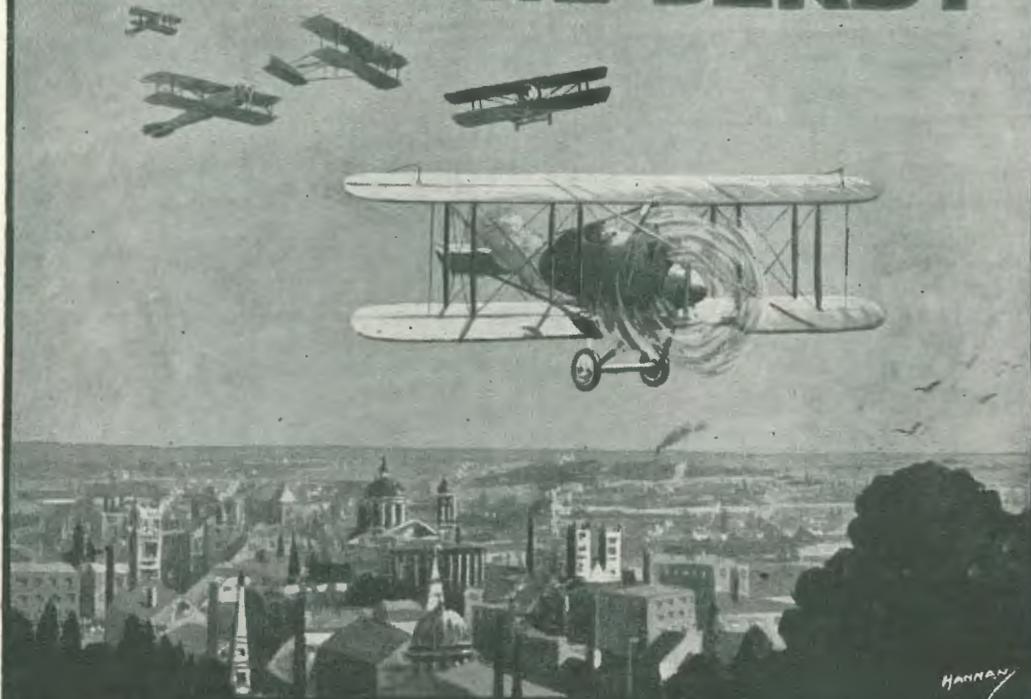
New South Wales Section.

A general meeting will be held in Sydney, in the Lecture Hall of the Royal Society's Rooms, on Tuesday, November 11. The chair will be taken at 8 p.m. by Lieutenant-Colonel W. Oswald Watt, O.B.E.

Among other items on the agenda will be a report from the sub-committee recently appointed to inquire into the conditions surrounding the Anglo-Australian Flight; also the appointment of an independent sub-committee to inspect aircraft and aerodromes controlled by commercial aviation companies in New South Wales.

Mr. H. E. Broadsmith, F.R.Ae.S., A.M.I.A.E., who arrived in Sydney on October 24, will deliver a lecture on Civil Aviation in Great Britain.

The AERIAL DERBY



"SHELL" WINS

The Aerial Derby, June, 1919, involved a Flight round London of about 190 miles.

Two Prizes were offered—one for the **FASTEST TIME** and one for the winner of the **SEALED HANDICAP**.

The former was secured by Capt. G. Gathergood, A.C.S., to whom was handed the £500 "Shell" Trophy. The winner of the Sealed Handicap was Capt. Hammersley, M.C., who received the £100 "Shell" Trophy.

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AVIATION IN WESTERN AUSTRALIA

By H. V. NORTON (late A.F.C.),
Special Correspondent to "Sea, Land and Air."

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The month of September has proved a very successful and profitable one for our local airman, Major Norman Brearley, D.S.O., M.C., A.F.C. (late R.A.F.). He has made two cross-country trips and conducted two exhibitions of fancy and stunt flying, in addition to carrying over 120 passengers. So fully has his time been occupied that he is now anxious to secure the services of another first-class pilot to relieve him. "In York and Northam," said the Major, "I was unable to carry all the passengers who had booked flights."

The first country trip was made on Saturday, September 20, to Northam, an agricultural centre, 70 miles from Perth by road, and about 55 by air. The Northam Show was on, and Major Brearley spent six days in the district, during which time some sixty residents made their first flight, at a cost of £5 each, and in some cases, £10. He left his hangars at Belmont at 1.55 p.m. carrying Mr. Birch, of Northam, and a cargo of butter, millinery and a special edition of the *Daily News*.

Midland Junction (10 miles) was passed seven minutes after starting, and the ranges were crossed at a height of 4,500 feet. Mundering Weir was very plainly seen, and at 2.15 p.m. Woorooloo Sanatorium (26 miles) was passed. Here, by special request, the Major circled round quite low for the benefit of the inmates. Just after leaving the institution, Northam (30 miles distant) came into view, and from a height of 6,500 feet, at Blackline, a seven-mile glide was made right into Northam, where a large crowd assembled to witness the landing. The time occupied on the journey up was exactly 42 minutes. The Major told me that from 6,500 feet over Blackline, he could still see the ocean, although the *Avro* was then some 60 miles inland.

The return was made on Friday, September 26, in stormy weather; indeed, so

boisterous were the conditions aloft that the airman on his first attempt decided to return and make a start when the wind and rain had moderated. Accordingly another attempt was made at about 4.30 p.m., the time taken being 55 minutes, against a strong head wind.

On this occasion an interesting cargo was carried, consisting of an Australian terrier dog, eggs, butter and a crate of day-old chicks. All landed safely at Belmont, being apparently unaffected by the "bumpy" journey.

On the following day, Saturday, September 27, Major Brearley was advertised to show at the North Fremantle Oval. Here he gave two exhibitions and carried a number of passengers.

On Monday, September 29, a second cross-country flight was made, this time to York, 60 miles by road. Leaving with Mr. Cooke, of Grass Valley, at 10.40 a.m., he rose to a height of 6,000 feet and called in at Northam for luncheon. On resuming the journey at 2.25 p.m. he was accompanied by Mr. M. Edwards, the 22 miles to York occupying 18 minutes.

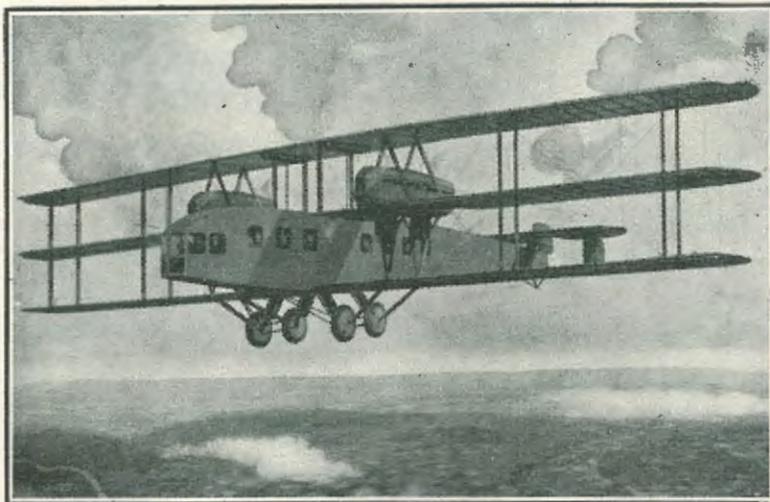
The York Show being in progress, most of the residents were in town. Major Brearley, who stayed five days, and carried 50 passengers, stated that half-a-dozen local farmers were hankering after the height record amongst themselves. One old cocky said he'd be game enough to go up to 6,000 feet. "How much would that cost, Mr. Brearley?" he questioned, to which the airman replied "Oh! about £15." "Right!" said the excited countryman, and up he went. A second decided to go 500 feet higher, and did. Then yet another of the six, determined to cap the lot, planked down £20 for a flip to 8,000 feet.

The return flight was made against a strong head wind in exactly one hour with a 63-year-old gentleman.

The "Bristol" Aeroplanes.

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EACH, or all the seats may be removed, making room for cargo up to 320 cubic feet. The wing span is 81 feet, overall length 52 feet, and height 20 feet. The speed at ground level is 125 m.p.h., and at 10,000 feet 113 m.p.h. The climb is 5 minutes to 5,000 feet, and 12 minutes to 10,000 feet. In addition to the two pilots the machine carries a load of 2,700 lbs. with fuel for 5 hours' flight, or 4,000 lbs. with fuel for 2½ hours' flight.

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AEROPLANE COMPANY LIMITED**

FILTON, BRISTOL, ENGLAND

THE WIRELESS INSTITUTE OF NEW SOUTH WALES.

SENATORE MARCONI TO BE PATRON.

A general meeting of the above Institute was held on October 24, at Wireless House, Sydney, Mr. E. T. Fisk presiding.

Minutes of the previous meeting having been confirmed, the honorary secretary, Mr. Malcolm Perry, read a letter from the Director of Education inviting the council to elect two delegates to represent the Institute at a meeting to be held in the Education Building, Sydney, on November 10, when an executive committee will be appointed in connection with the proposed formation of a Commonwealth Institute of Science and Industry.

As delegates, Mr. E. T. Fisk and Mr. Malcolm Perry were unanimously elected.

Expressions of satisfaction greeted the President's announcement that Senatoré Marconi had accepted the invitation to extend his official patronage to The Wireless Institute of Australia.

Commencing on October 31 a series of examinations will be held for the benefit of members desirous of qualifying for the certificate of proficiency.

Various technical questions having been dealt with, Mr. Fisk delivered an interesting "blackboard" lecture on "The Detecting and Relaying Action of the Thermionic Valve."

AMALGAMATED WIRELESS (AUSTRALASIA) LIMITED.

Following the recent decision of the shareholders to increase the capital of the Company by £60,000 to a total of £200,000, the directors have decided to issue immediately 20,000 new £1 shares at par. These are now offered to shareholders in the proportion of one new share for every seven shares held.

Marconi's Wireless Telegraph Co., Ltd., of London, who are large shareholders, have already notified their intention of taking up their proportion of the new capital offering.

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WIRELESS WORKSHOPS AT RANDWICK

REPORT OF ROYAL COMMISSION

The following is a copy of the First Progress Report presented to His Excellency the Governor-General by the Royal Commission which was appointed "to Consider and Report upon the Public Expenditure of the Commonwealth of Australia, with a view to effecting Economies."

* * * *

1. With regard to the Wireless and Electrical Workshops at Randwick, the following is an extract from the annual report of the manager, Mr. A. E. Cornwell, dated 26th March, 1919:—

"In response to inquiries made with a view to obtaining information to enable estimate proposals for the period 1919-20 to be prepared, the Director of the Radio Service has advised that he does not anticipate that many orders for the supply of new apparatus will be placed with the Workshops during 1919-20, and that the work from the Radio Branch of the Department is most likely to be in the nature of repairs to existing apparatus. It will thus be seen that the main source of demands on the activities of the Workshops, and incidentally the initial reason for the purchase of the Workshops is greatly affected. I am therefore of opinion that in order to keep the Workshops fully staffed (and it is only by maintaining the establishment in a fully staffed condition that the heavy charges for depreciation, interest, etc., can be met) it will be necessary to obtain other outlets for the activities of the establishment."

2. The Commission visited the Workshops in question, and, as will be gathered from the manager's report, found that there was not sufficient work in view to justify its continuance.

3. The work required on behalf of the Wireless Branch will be in the nature of repairs, and in the opinion of this Commission the necessity does not exist for having separate workshops for repairing ordinary Telegraph and Wireless Tele-

graph apparatus. The mere fact that two Departments are interested does not justify this extravagance.

4. It is recommended that repairs to Wireless apparatus be carried out at the same workshops as that at which repairs to Telegraph and Telephone apparatus are carried out.

5. The Workshops are badly laid out, and in order to enable work to be done economically would require considerable further expenditure upon them. The Manager points out that the grouping of the various workshops comprising the establishment is not satisfactory from the view point of efficient working, and approval has been sought by him for further expenditure in alterations to the buildings.

6. With regard to the machines, the Manager states that employment has not been found for certain machine tool units in the Workshops. The Workshops are lacking in respect to other machine tool units with the result that improvisations have had to be made, and he recommends that further expenditure to provide these machine tool units be undertaken.

7. With regard to the power plant, the Manager states that the battery installed in the Workshops is causing anxiety, and he is of opinion that extensive repairs may have to be made during 1919-20.

8. An analysis of the manufacturing account for the years ending 30th June, 1917, and 30th June, 1918, discloses an unsatisfactory position.

9. During the year ending 30th June, 1917, the value of material used on productive jobs was £12,103. The direct labour expended on this material was £10,020. The overhead charges were £14,694, which is equal to 146 per cent. on direct wages.

10. During the year ending 30th June, 1918, the value of material used on productive jobs was £17,288. The direct labour expenditure on this material was £13,363. The overhead charges were.



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£16,390, which is equal to 123 per cent. on direct wages.

11. The overhead charges include interest on capital at 4 per cent., whereas it is extremely improbable that the money was obtained much under 5 per cent. If the latter percentage had been charged, the overhead percentage would have been substantially increased.

12. For the financial year 1917-18, the profit and loss account showed a loss of £3,493 18s. 9d., notwithstanding the fact that "Commander Cresswell, the Director of the Radio Service, is of the opinion that the charges made by the workshops for apparatus and material supplied to the Radio Service are already too high"—(quotation from Workshops Manager's annual report).

13. The Workshops Manager claims that in order to give the workshops a chance of competing with the imported article, the amount by which the workshops are over capitalised will have to be written off.

14. It is worthy of note, however, that if no interest whatever had been charged to profit and loss account during 1917-18 on capital, there would still have been a loss as the interest charged at 4 per cent. amounted to £3,288, whilst the loss was £3,493.

15. The Manager states that another difficulty under which the workshops have laboured is that no settled programme has been laid down for them, and consequently no forecast of the demands likely to be made on them has been possible.

16. It seems to this Commission that such a statement is equivalent to stating that these workshops were acquired without any clear idea as to the work they were required to undertake.

17. In our opinion, the workshops should be disposed of without delay.

18. We would like to add that we formed a most favourable opinion of the capacity of the Manager, Mr. A. E. Cornwell.

19. If, however, it is intended to retain the workshops, and if they hope to compete in quoting against outside workshops

doing similar work, it will be necessary to write the capital down so that it will represent the true value of the assets.

20. Of the amount spent in purchasing the workshops, £2,000 is represented in patterns; £2,000 in castings; £3,200 in tools and dies; and £1,000 in wireless equipment of the workshops. The Manager states that "the patterns, castings, tools, and dies are not going to prove of much value to the workshops."

21. If our recommendation that these workshops be disposed of be adopted, we would emphasise the desirability of acting at the earliest possible moment, as any delay will lessen the chance of obtaining favourable prices for the machinery and plant.

* * * *

22. Since writing the above, it has come to the knowledge of this Commission that the Director of Vocational Training of the Repatriation Department has been inspecting these works for the purpose of seeing whether they may be advantageously utilised for the extended scheme of vocational training authorised by the Federal Government, and now being organised in connection with the repatriation of soldiers. It is understood by the Commission that the facilities already existing in New South Wales are quite inadequate to meet the demands of this scheme. It is therefore necessary to acquire additional buildings and plant for this purpose. The Commission also understands that the Director of Vocational Training is of the opinion that in many respects the buildings, machinery, etc., will be eminently suitable for the purpose in view, and it therefore seems that this offers an opportunity for placing these assets at the disposal of the Repatriation Department. The economic advantages of this are obvious, and it is unnecessary for this Commission to enlarge upon them.

23. It might be suggested in passing that any stock, material, or plant not required by the Repatriation Department for carrying out this scheme of training should be at once disposed of, thus taking advantage of the present opportunity of securing satisfactory prices for this material.

The Shock-Troops of Commerce.

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WIRELESS TELEPHONY

By E. N. Da C. ANDRADE

Once it had been shown that electrical energy could be thrown into space in the form of waves, and to some extent recovered again by suitable apparatus, it became theoretically possible to do without wires any of the things which had previously been done by sending electricity along wires. From the knowledge that it is scientifically possible to carry out some feat to the actual realisation is a step which usually waits for some new technical advance. Just as, after the possibilities of flight had been demonstrated by Langley, a suitable engine was needed to complete the construction of a flying aeroplane, so, after it had been shown that electric waves could be transmitted through space and detected some yards away, Marconi's coherer came to make wireless telegraphy a practical thing. Wireless telephony, as well as telegraphy, is now possible across the Atlantic, and boats can be steered by wireless from the shore (the German crewless boat operated from the Belgian coast and destroyed by our craft will be remembered). Photographs, the possibility of transmitting which by ordinary telegraphy had been demonstrated some years ago, have actually been sent by wireless over a few miles, although this remains a slow and complicated process of not very great utility. As regards wireless telephony, very great advances have been recently made by the use of a device known as the electric valve. Like so many other inventions of great practical use, this is based upon experiments carried out in the laboratory by people interested in their purely scientific aspect, and not looking for any invention. It has long been known that hot metals glowing wires, for instance, give out electricity into the surrounding space in the form of small particles, or electrons, just as hot liquids give off vapour. Edison showed many years ago that if in an ordinary electric incandescent lamp a plate was put alongside the glowing filament, but not touching it, a current would pass between this plate and the filament; this is due to the electrons shot out by the hot wire. Professor Fleming, to whom wireless tele-

graphy owes so much, studied this in great detail, and developed the electric "valve" to which reference has just been made.

The task of wireless telephony is to make the fluctuations of the air caused by our speech govern fluctuations of strength of wireless waves, which can be converted into sound again at the receiving station. In ordinary telephony with wires, the varying pressures of the air set up when we speak act on a very thin metal plate, behind which are loose carbon grains, alternately compressed slightly and then released as the plate moves to and fro. (This plate and the carbon grains constitute the so-called microphone.) This causes the resistance of the carbon to electricity to change in time with the air pulsations, and so the current, which is being passed through it varies also in time. This current is thrown into the wires which connect the two stations, and at the receiving end it passes round a little magnet, making it stronger or weaker as the current varies. This magnet accordingly pulls a little iron plate in front of it to and fro in time with the variations of the voice; and so reproduces the spoken word. Now for wireless telephony, in place of the current which flows through the microphone, a continuous stream of electric waves is being thrown into space from the aerial wire at the sending end, and what we have to do is to make the intensity of this stream fluctuate in time with the vibrations of the voice. A very great amount of energy has to be sent out in order that it may be detected hundreds of miles away, so that to take an ordinary microphone, and then to try to make the small vibrations of resistance which take place when we speak into it control directly this enormous stream of energy would be to attempt a task analogous to what Heath Robinson has done in his drawing of the German Army learning the goose-step, where we see a diminutive goose shackled to a squad of Germans, right leg to right legs and left leg to left legs, and raising the legs of the whole squad at each step. To make the little goose of our voice control the squad which is the stream of wireless

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If you have ever driven through from Sydney to Melbourne you will appreciate to the full the meaning of the above words. They are taken from the letter quoted below; a letter written by a gentleman of much motor experience, and the unsolicited praise of his purchase is a greater testimony to the efficiency of the Scripps-Booth than anything we might say ourselves.

19th August, 1919.

Messrs. John McGrath, Ltd.,
198-200 Pitt Street, Sydney.

Dear Sirs,—

We have much pleasure in reporting that we have safely arrived in Melbourne after a very nice trip. We had absolutely no trouble of any sort along the road, with the exception of a horse shoe through one of our tyres; but so far as the machine itself went, it was absolutely trouble proof, and we did not open the tool kit.

The consumption of benzine on the trip worked out at a fraction under 24 miles to the gallon, or to be more accurate, we did 572 miles on just six tins of benzine. The lubricating oil used amounted to five pints and the gauge in the engine showed up to the full mark on our arrival in Melbourne. This would work out at somewhere about 800 or 900 gallons, which the writer thinks is remarkably good.

The water in the radiator, notwithstanding the hard climbing and bad roads, did not once show any signs of boiling, and, in fact, it seems almost impossible to overheat the engine. On the whole trip through we replenished the radiator with about four or five pints of water.

The Car was greatly admired in every town in which we stayed and whilst we were at Goulburn.

Yours faithfully,

We will be pleased to show the original of this letter to anyone interested. The Scripps-Booth is the neatest and sweetest-running Car on the roads. It is a light car (19½ cwt.), but has all the qualities of the heavier makes. It is lengthy and roomy, and light on consumption, and the price is right too. Let us send you full particulars.

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energy we must magnify up the small variations caused in the current through the microphone when we speak into it, and it is for this purpose that the "valve" is now used.

The modern valve consists of a fine straight wire surrounded by a small cylindrical coil of wire, termed the grid, which nowhere touches it; this coil is in turn surrounded by a small plate bent into a cylinder. The whole is enclosed in a glass bulb, like an ordinary electric lamp bulb, pumped free of air, as is necessary for efficient working. A fine central wire runs from the top of an upright wire. This fine wire is kept glowing by sending a current through it, and is just like the filament of an ordinary lamp, but straight. It is also connected to the outside cylindrical plate by a wire containing a source of current, say an electric battery. In the ordinary way not many of the electrons, or particles of electricity, which come out of it, as already mentioned, reach the outside plate, and consequently very little current passes from the wire to the plate, but if a *small* electric force is created between the wire and the grid it is sufficient to make most of them reach the plate, and then a comparatively *large* current passes. In use, the wire and the grid are connected with an ordinary microphone circuit, and the fluctuations of electric force caused by the voice are sufficient to push intermittently most of the electrons as far as the plate, which causes *large* fluctuations in the current from the wire

to the plate, fluctuations which are in time with the voice.

Of course, if the current is not sufficiently magnified by one valve, the variations which this valve produces can be magnified by a second valve, and those produced by the second valve magnified by a third, and so on. Batteries of valves are in common use. Besides controlling the wireless energy the valve has a variety of other uses. It is used at the receiving end to convert the oscillations back into sound. It can be used to send out itself the continuous electric waves which are controlled by the voice, as well as to modify them. To understand this we may consider the ordinary telephone. If we put the receiver, or ear-piece, to the transmitter, or mouthpiece, at each end, the telephone will give out a shrill note by itself, that is, will manufacture a continuous stream of sound waves. The reason for this is that any slight noise falling on the mouth-piece travels round to the ear-piece, which, being near the mouth-piece, speaks into it a sound, which travels round again, and is repeated into the mouth-piece, and so on. A strong vibration is thus built up, the energy coming from the cells of the telephone. In a similar way the valve can be made to build up a strong electrical vibration, the energy coming from a source of current connected to the valve. Valves are being used in this way for the continuous wave system of wireless telegraphy, as well as telephony.

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What has your present position to offer you?

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Think well over these questions. If you cannot answer them satisfactorily there is something wrong with your present job. That being so, look around and see where the good positions are.

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OUR QUESTION BOX.

W. J. Compton, Corowa:—(1) The air-speed indicator is an instrument which registers the speed of the aeroplane in relation to the air, which is quite distinct from its ground speed. For example, a machine flying at 50 m.p.h. against a 60 m.p.h. gale has a forward air speed of 50 m.p.h., but a backward ground speed of 10 m.p.h. (2) Petrol Tanks: The material frequently used is tinned-steel sheets of best quality, about 22 to 24 gauge, riveted up with $\frac{1}{8}$ in. snap-headed copper rivets, and best tinman's solder. The workmanship must be extra good as it has to stand internal air pressure and all joint riveting and sweating with solder must be perfect, otherwise serious leaks may develop and cause fire to break out in the air—with fatal results.

"L.F.H.," Summer Hill:—(1) The distance between Colombo and Penang is 1278 miles. (2) Colombo to Galle, 70; Galle to Dondra Head, 24; Dondra Head to Pulo Rondo, 871; Pulo Rondo to Muka Head, 298; Muka Head to Penang, 15. (3) We have no direct information, but believe that this route has not been flown.

"Hector," St. Kilda:—No, a Wing Examining Officer does not examine the wings of an aeroplane.

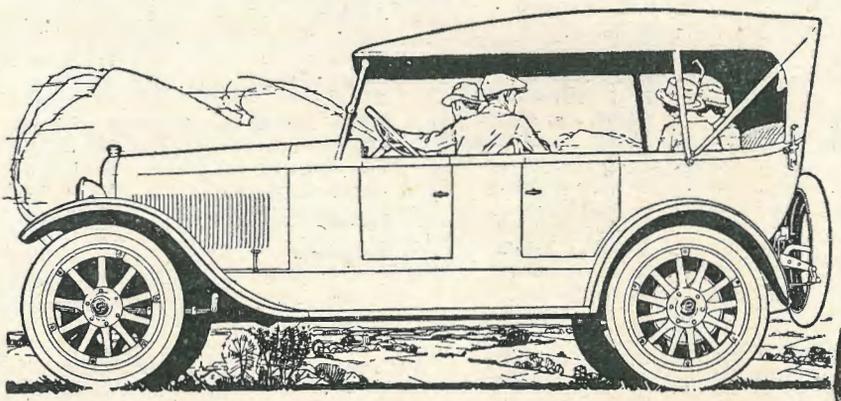
"Alpha," Townsville:—Your inquiry (6/9/19) is in hand; certain new decorations are said to be contemplated, and we will advise you as soon as finality is reached.

W. David, Victoria Park, W.A.:—Santos Dumont's "Demoiselle," otherwise known as Santos XX, made its first cross-country flight on September 16, 1909, from St. Cyr to Buc, a distance of about 17 kilometres—which it covered in 15 minutes and then returned. The "chassis" (as it was then called) was constructed of three main bamboos, 2 inches in diameter; two at bottom and one at top, braced together into a triangular cross sectional frame by steel struts of oval section. Length of frame was 16ft. 5in. to the front, and carried a main plane on the higher level and two small wheels below. The engine was installed above the pilot's head. The surface of the planes was of silk fabric. Span 18ft; chord 6ft. 5in., total area of main plane being 115 sq. ft. The tail moved as a whole and was pivoted on universal joint at rear. The vertical member, fitted 3ft. from rear of "chassis" carried the wires which operated the elevator portion of the tail, the lower end being set round at right angles to form a small rear runner. The engine was of the twin-cylinder opposed type, by the Darracq Company. No fly wheel was fitted to the engine, the propeller being keyed directly to crankshaft. The propeller had two blades, and was 6ft. 6in. in diameter, the centre being 4ft. 2in. from ground level. Total weight of the machine was 242lbs., of which the engine weighed 110lbs. A complete description of this machine will be found in "The Art of Aviation," by Robert W. A. Brewer, published in 1910, by Crosby Lockwood & Son, London.

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The Chandler—The Pride of the Sixes

On Saturday, October 25, a fleet of seven Chandler Sixes left Sydney for Melbourne overland, in order to keep faith with purchasers to whom they had been promised. The abnormally heavy "Cup" traffic, both by train and boat, precluded delivery by either of these methods, and the only alternative was to despatch them under their own engine-power.

Leaving at 6.30 a.m. on Saturday, the fleet—comprising Roadsters, Touring Cars, and Chassis—arrived in Melbourne on schedule. The last sixty-one miles (from Seymour) was hit up in 85 minutes. Remember: **WHAT ONE CHANDLER CAN DO, EACH AND EVERY OTHER CHANDLER WILL DO.**

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Revised to October 27, 1919.

SHIP.	OPERATOR.	SHIP.	OPERATOR.
<i>Apolda</i>	J. W. McKay	<i>Moana</i>	{ J. F. Hutton (s)
<i>Arawatta</i>	V. Blight		{ J. G. Campion (j)
<i>Arahura</i>	G. Donnelly	<i>Moeraki</i>	H. F. Hartley
<i>Aramac</i>	R. D. Thompson	<i>Monowai</i>	L. V. B. Sutton
<i>Australbrook</i>	R. E. Haddock	<i>Mokoia</i>	F. N. Davidson
<i>Australcrag</i>	E. S. Earngey	<i>Montoro</i>	N. W. Marshall
<i>Australford</i>	T. W. Bearup	<i>Morialta</i>	L. N. Callaghan
<i>Australglen</i>	J. R. Gilligan	<i>Morinda</i>	F. C. Davies
<i>Australmead</i>	G. Pow	<i>Navua</i>	S. E. Brown
<i>Australmount</i>	A. R. Catford	<i>Ngakuta</i>	H. Bargrove
<i>Australpeak</i>	C. H. Kidman		{ W. J. Martin (s)
<i>Australplain</i>	S. R. Dixon	<i>Niagara</i>	{ G. Hugman (j)
<i>Australpool</i>	K. J. Dines		{ E. A. Miller (s)
<i>Australport</i>	A. H. Jeremy	<i>Ooma</i>	{ T. Ward (j)
<i>Australrange</i>	C. Black		{ D. N. Quinn
<i>Atua</i>	G. Ross	<i>Oonah</i>	D. N. Quinn
<i>Bellata</i>	T. V. Tressler	<i>Paloona</i>	J. A. Meek
<i>Bingera</i>	J. D. Toohey	<i>Paringa</i>	L. S. Lane
<i>Bombala</i>	T. Bannister	<i>Pateena</i>	F. E. Duggan
<i>Bundarra</i>	H. K. Burbury	<i>Rakanoa</i>	A. T. Blomfield
<i>Canberra</i>	E. F. Hayes	<i>Riverina</i>	H. A. de Dassel
<i>Cethana</i>	K. L. Freeman	<i>Rotomahana</i>	W. E. C. Sawyer
<i>Challamba</i>	H. W. Barnfield	<i>Rupara</i>	G. Cook
<i>Changsha</i>	R. H. Alexander	<i>South Africa</i>	C. Williamson
<i>Charon</i>	J. E. Cleary	<i>St. Albans</i>	W. H. Harris
<i>Coolcha</i>	M. A. Prudence	<i>Taiyuan</i>	E. J. Giles
<i>Coolgardie</i>	R. S. Taylor	<i>Tahiti</i>	E. M. Bain (s)
<i>Cooma</i>	A. H. Hawkins	<i>Talune</i>	{ H. Speed (s)
<i>Culburra</i>	J. R. D. Davis		{ T. H. McWilliams (j)
<i>Dimboola</i>	A. F. Vipan	<i>Tarawera</i>	F. A. Hunter
<i>Eastern</i>	P. C. Gillon	<i>Tofua</i>	{ W. A. Hawkins (s)
<i>Flora</i>	H. F. Harman		{ C. F. G. Taylor (j)
	{ T. A. Jones (s)	<i>Ulmaroa</i>	
<i>Indarra</i>	{ C. F. Green (j)	<i>Victoria</i>	F. J. C. Hall
	A. E. Sheppherd	<i>Wahine</i>	A. J. E. Corbett
<i>Kaipoi</i>	S. A. Ludlow	<i>Waihora</i>	{ V. M. Brooker (s)
<i>Kaitangata</i>	R. R. Robinson		{ F. L. Dawes (j)
<i>Kaituna</i>	C. Smith	<i>Waimarino</i>	{ A. Cuthill (s)
<i>Kaiwarra</i>	W. J. Washbourne		{ L. H. Jones (j)
<i>Kanowna</i>	S. G. Jones	<i>Waipori</i>	H. E. Young
<i>Karori</i>	M. Sedgers	<i>Wairuna</i>	{ A. S. Smith (s)
<i>Karoola</i>	B. Boni		{ H. G. Reilly (j)
<i>Katoa</i>		<i>Waitemata</i>	{ C. F. Griffiths (s)
<i>Katoomba</i>	N. G. W. Scott		{ N. H. Brown (j)
<i>Kauri</i>	V. M. Simpson	<i>Waitomo</i>	A. S. Dening
<i>Koromiko</i>	H. Fullerton	<i>Wanaka</i>	H. M. B. Arthui
<i>Kowarra</i>	{ D. C. Lane (s)	<i>Wandilla</i>	T. Chalmers
	{ C. Hart (j)	<i>Westralia</i>	M. A. Ryan
<i>Kurow</i>	S. J. McVeigh	<i>Whangape</i>	{ C. H. Brown (s)
<i>Levuka</i>	J. H. Williams		{ R. W. Barnes (j)
<i>Loongana</i>	A. L. Dixon	<i>Willochra</i>	{ F. A. Cook (s)
<i>Macedon</i>	J. A. Heavey		{ F. N. Williams (j)
<i>Maheno</i>	H. L. Miller	<i>Wodonga</i>	J. Welch
<i>Maķambo</i>	{ L. G. Devenport (s)	<i>Wyandra</i>	R. M. Firminger
	{ E. A. Hunter (j)	<i>Wyreema</i>	H. Tuson
<i>Makura</i>	L. R. Dickson	<i>Zealandia</i>	—
<i>Manuka</i>	V. C. C. Parke-McIl-	<i>Zealandic</i>	E. A. Burbury
<i>Maori</i>	veen (s)		
	{ J. H. Bennett (s)	Junior Operators on M.I.M.C.C. Ships.	
<i>Marama</i>	{ A. E. Lawrence (j)	SHIP.	OPERATOR.
	H. A. Bloxham	<i>Port Sydney</i>	F. H. D. McIlveen
<i>Mararoa</i>	W. H. Richardson	<i>Mahana</i>	F. L. Scott
<i>Marsina</i>	L. J. Glyde		
<i>Mataram</i>		Standing by—Sydney.	
<i>Maunganui</i>		SHIP.	OPERATOR.
<i>Melusia</i>	R. R. Pilmore	—	J. Elmore
<i>Minderoo</i>	J. G. C. Higgins	—	H. M. Lamb
<i>Mindini</i>	A. Stuart	—	J. F. McGinley