FLYING IN AUSTRALIA.

Paper by Mr. H. L. J. Hinkler read before the Institution at the Engineers' Club, Coventry Street, W.1, on 6th February, 1924. The Chair was occupied by Dr. A. P. Thurston, D.Sc., F.R.Ae.S., etc.

Owing to unavoidable absence of Mr. Hinkler on aeroplane test flights at Manchester, Major F. A. Dev. Robertson, M.A. kindly read the paper, which was as follows:

INTRODUCTION.

MR. H. L. J. HINKLER said:

With the usual apologies, hurried preparations, etc., I offer to you these few notes on things concerning the Australian air.

As far as my memory serves me, the first serious and successful flying was done by one Harry Houdini in 1910 with one of the old Voisins "Bird of Passage" type at Sydney. Many years previous our noted pioneer, Lawrence Hargrave, the originator of the box kite, had made many successful model aeroplanes.

Quite a number of enthusiasts essayed flight in the early days, but a fair proportion of good efforts were handicapped by their inability to procure a suitable motor of any kind; so that the first demonstrations of flying were carried out by a couple of visitors—an early Wright and a Bleriot XI.

Both these machines came to a sad ending, though not (as you might have supposed) the almost obvious one, but from entirely different circumstances. They were both brought out as a "Spec," hoping to make big dividends for their sponsors, but proving a financial failure, and the tariff duties not being paid, the Customs found a certain satisfaction in consigning the "Wright" to be sunk in Hudson's Bay.

The Bleriot remained in bond for years in Brisbane, and owing to bad storage, an examination I made at the time with a view to purchase showed the outfit was slowly rotting itself away.

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Early in 1911 Hammond arrived in Sydney with a " Bristol " box-kite, and after a number of flights sold the machine to W. E. Hart. This pilot, after doing some good flying, decided on building a monoplane of his own design. Most of the parts, including the motor, were taken from the biplane. He flew this bus all right, but later had a serious crash with it.

About the same time an American pilot, A. B. Stone, was touring Australia with a Bleriot-type monoplane. Quite a number of people witnessed successful flight, and many others had the extra thrill of a crash thrown in.

So much for the opening chapter of Aviation " down under."

The elements in Australia are ordinarily peaceful, and while destructive cyclones have visited various parts, more especially coastal areas, such visitations are rare, and may be properly described as erratic. During the winter months the southern shores of the continent are subject to cyclonic storms evolved from the V-shaped depressions of the southern low pressure belt. The north-east coast of Queensland is occasionally visited by hurricanes from the north-east tropics. Very severe cyclones, locally known as " willy nillies," are peculiar to the north-west coast of Western Australia from the months of November to April. After leaving the north-west coast these storms either travel southwards following the coastline, or cross the continent to the Great Australian Bight. When they take the latter course their track is marked by torrential rains, as much as 29.41 inches, for example, being recorded in 24 hours at Whin Creek from one such occurrence. Falls of 10 inches and over have frequently been recorded in the northern interior of West Australia from similar storms.

In Australia there are five chief sorts of wind storms: (a) The gales which frequently occur about deep southern depressions, " lows," or southern cyclones; (b) Squall winds which normally occur in violent thunderstorms; (c) The southerly busters and related line squalls; (d) Tornadoes, " cock eye bobs," cyclones or " twisters "; (e) Hurricanes or " willy nillies," and related tropical cyclonic storms. Taken on the whole, however, Australia has wonderful atmospheric conditions for aviation, and is truly ideal for flying.

Until early in 1921 civil aviation in Australia was entirely in the hands of enthusiastic and able young pilots, who, when the war finished, sank their gratuities, etc., in the purchase of aeroplanes, mainly with a view to joy-riding. They started with high expectations; unfortunately their hopes were dashed; the people did not show the anxiety to fly with them that had been anticipated.

About this period there was an agitation for the Government to take a controlling interest in the administration of the business. It was realised by the Government that civil aviation had come to stay, and that although the early steps must be necessarily more or less halting, when it was developed it would prove an enormous benefit to the Commonwealth, as this is a country of wide spaces, and with more or less inadequate means of communication; and that even if the modified war machines of that period were not

economical propositions in comparison with the cost per ton-mile of other forms of transport, yet it would be only a matter of time before aeroplanes became most formidable competitors with other forms of transport, or most beneficial auxiliaries thereto. It was palpably better for the well-being of the industry that the public companies should own, organise and maintain the aerial service, with at first a subsidy from the Government. It was therefore decided that tenders should be called for four aerial services, operating in all between 3,500 and 4,000 miles.

The first contract was let to a company in Western Australia, and this company has continued to grow and extend its activities and has well maintained its lead in Australian Aviation.

The second contract was let to a company in Central Queensland some twelve months later, with a length of route of approximately 600 miles.

The third contract was let to a Melbourne company to operate between Adelaide and Sydney at about the same time as the Queensland contract was let, but the third service was not started until nearly two years later.

There was also a contract for a service between Sydney and Brisbane which allowed the contractor the alternative use of flying-boats, but this remains the only one still to make its inaugural flight.

The company operating the Sydney-Adelaide route commenced operations on the 2nd of June last, their fleet consisting of (1) a Sopwith Wallaby; (2) a Sopwith Antelope; (3) one Gnu; (4 and 5) a pair of Doves; (6) a D.H.4; (7) a D.H.9 and one Avro 504K. Since, a number of D.H.50's have been added.

This route, with one exception, is over a magnificent stretch of country. From Sydney to Goulburn it is not too good, and apparently there was a certain amount of anxiety in the preparation of that centre. The journey covers a distance of about 800 miles, and the contract calls for the service to be performed weekly in both directions.

The company operating in Central Queensland is usually known as "Quantas," the word being derived from their full title, Queensland and Northern Territory Air Service. The service they operate is a particularly useful one, and consists of linking up a number of railheads. Travelling between these dead-ends previous to the arrival of this company with their machines was a most tiresome business, the old type stage coach being the conveyance. Not only this, but the roads, or rather the tracks, used were somewhat crude and rough, so that a day's journey out in these parts fatigued one pretty badly.

This Company opened its doors with two Armstrong Whitworths (160 Beardmore), one Avro Triplane (160 Beardmore), one Avro 504 (100 Dyak), one B.E.2 (90 R.A.F.), and one D.H.4, during September, 1922. Recently their fleet was improved by the addition of a number of D.H.50's.

The route, Charleville—Cloncurry, inclines one to use superlatives for its description. Ideal flying country with vast stretches of open downs, level as a bowling green, an equable climate, a district blessed with prosperity

considerably in excess of the average, large thriving towns, unlinked by railway communications, immeasurable station properties (three or four thousand square miles being by no means uncommon) stretching away westward from the various railheads of central Queensland; equally large districts split up into relatively small individual stations, some of them hundreds of miles from the nearest railway line, with main roads impassable during the wet season; in short, an air company's paradise.

The only trouble is the provision of wet weather landing grounds, because during the wet season, for sometimes weeks at a time, all land transport is held up owing to the boggy nature of the ground as well as floods.

The opening flight on this service began on 2nd November, 1922, when one of the Armstrong Whitworths took off with the first mail consisting of 108 letters for the town of Tambo, 105 miles distant. The first day's run finished at Longreach, with 265 miles covered. The mail (which was promptly delivered to and by the Postmaster) included an exchange of stock-returns between Charleville and Longreach agents within 16 hours of posting, instead of six days as heretofore.

The following morning the continuation of the run was made to Cloncurry. On this occasion the Company's first passenger was carried. This was one Mr. Kennedy, owner of Buckingham Downs Station, who has been a resident of Central Queensland for 53 years, and has passed his 86th birthday. His first trip to Cloncurry in the 'seventies had occupied eight months; that was by packhorse; he had now done it in four hours.

The Company now advertise passenger rates at 9d. per mile, and are also able to announce 160,000 miles flown with an efficiency of 100%.

Full loads have become the rule rather than the exception, and no sooner had modern commercial aeroplanes appeared on the mail route than there arose a demand for passenger accommodation far in excess of the contractor's present resources.

Quite apart from the mail trips, which have been carried out in a manner satisfactory to all concerned, the Company's Taxiplanes were worked almost to a standstill in handling " Flood traffic " during the February 20th—March 14th, 1924, inundations.

On relief flights covering nearly 2,000 miles, 56 passengers were carried, in addition to heavy consignments of groceries, dairy produce, potatoes and other necessities, including medicine and beer. In connection with this last " item " it is probable that the members of a certain shearing camp at Longreach had never before fully appreciated the amenities of air transport. First the party of shearers were flown over impassable roads to the West Longreach sheds. Next, as a happy afterthought, the enterprising licensee of the West Longreach Hotel imported per taxiplane a special load of beer, whisky and rum, weighing over two cwts. Commenting thereupon, the local newspaper observes: " It is quite probable that this last-mentioned exploit will advertise Quantas more than anything else it has done in its short but successful career." The same paper acclaims Quantas as " The

Pride of the Central West." The returns also refer to 36 passengers " ferried " across the flooded Thompson River which was running five miles wide.

The West Australian Company have now been in operation since the latter part of 1921. The length of route is 1,500 miles between termini, and making a total of 3,000 miles weekly return trip they can claim to have the longest passenger-carrying airway in the world. The service originally operated between Geraldton and Derby, with calls at Carnarvon, Onslow, Roeburne, Port Hedland and Broome. About 12 months ago the route was extended south to Perth. There is also every hope for a further extension in the north, adding another 560 miles from Derby to Wyndham, thus bringing the total length of the Nor'West Airway to something over 2,000 miles. To appreciate what this means to us over this side; an airway of similar length operating from London would reach as far as Alexandria.

Upon a review of the figures and performances for a period of 12 months to June 1924, the Controller of Civil Aviation congratulated the Company upon maintaining 100 per cent. efficiency for the whole period.

In comparing flying conditions in Australia with those in England, it is only necessary to mention that the greatest troubles in England are practically non-existent in Australia.

I refer now to fog and snowstorms, etc., with which we are harassed during a fair proportion of the winter months, whereas in Australia, and particularly Queensland and Western Australia, the whole length of the aerial route flown over is 95 per cent. clear. When clouds are met with they are usually cumulus clouds ranging from 2,000 feet upwards. At certain times of the year, largely in mid-summer, bad storms are liable to be met with and these storms cause considerable damage to property, and are a menace to shipping on the coast, but ample warning is given of their approach.

Aerial mail contractors can then take the necessary precautions to avoid running into these disturbances in which an aeroplane could not possibly live. Winds approaching 200 miles an hour have been recorded, and buildings have been moved bodily with the force of the gale. The storms referred to are something similar to the cyclones met with in the far East, but an average for the last 50 years shows that only one storm per year is experienced.

Regarding the West Australian air route, the country flown over is comparatively flat, with hills of only a few hundred feet altitude to be crossed, and these in very isolated places. The length of route is served by an overland telegraph line and each aeroplane carries as part of its equipment a field telephone, which can be brought into immediate use in case of forced landings. By means of a direct line between the Central Post Office in the city of Perth and the headquarters of the Airways Company, almost direct communication is established between a pilot suffering a forced landing and the head office of his company.

As machines are traversing a route that is very sparsely populated, and very often no habitation or signs of civilization is seen for 50 miles at a stretch, what this telephonic and telegraphic communication means to the aerial service can readily be imagined. The privilege of cutting in on the telegraph line has been extended to the Company by the Postmaster General's Department on condition that it is not abused. When information was asked by the Controller of Civil Aviation regarding the number of times this privilege had been made use of in two years' operations, the fact was elicited that only on seven occasions in this period had the use of this privilege been necessary.

The regularity and efficiency of the West Australian service can be attributed to several causes. Apart from the very fine climatic conditions, visibility often being 100 miles, and the suitability of their route for forced landings, there is the selection and training of the pilots and mechanics who are employed in the service, and the exceptionally fine maintenance works carried out on the machines. It is interesting to know that no pilot is employed in the service until he has undergone a refresher course at the hands of the Company itself, no matter what the pilot's previous experience in flying may have been. The value of this refresher course is considerable, in that it has been the means of eliminating faults, that are possessed by quite a number of very experienced pilots, the methods of teaching being such that a really sound commercial pilot is turned out.

The same applies to the mechanics who, in spite of previous experience, are required to go through a course of training and observation at head-quarters depôt before taking up any work at other depôts or carrying out any work on their own account. The freedom from forced landings has been largely due to these methods.

The inspection of machines and engines and also the inspection of personnel is carried out by the Department of Civil Aviation in Australia, and their reports are such that the West Australian Co., can rightly claim a prominent position in the world of Aerial Transport.

Their fleet consists of 6 Bristol " Tourer " three seaters fitted with Puma engines, 2 D.H. 50's, and one Avro 504K fitted with Mono engine, which is used for refresher courses and testing purposes.

Part of the requirements of the Federal Government of Australia compel the operating companies to have spare machines stationed at various points along the length of their route. This means that these machines are lying idle for a fair amount of their time, but being in tropical regions it also means that they are deteriorating to a certain extent and need reconditioning and overhauling almost as much as they would were they in flying use.

The average daily mileage flown by each machine is just over 500, and passengers can traverse the length of the route either way in two and a quarter days. Most of the trips between stopping places are between 200 and 300 miles in length, so that an aeroplane has quite a useful carrying capactiy, and the necessity for refuelling can be concentrated at main

depôts.

The only competition met with is a slow and erratic service of steamers, which take over seven days to traverse the same length of route, while ports of call and dates of arrival and departure are most uncertain. The number of letters carried by this service has grown from a mere handful to over 18,000 per month. These letters are surcharged at 3d. per half-ounce in addition to the ordinary postage, and the revenue received from the Department from this small surcharge amounts to over £2,500 per annum.

Before the inauguration of the aerial mail service it was quite the usual thing for merchants in Perth to receive replies to letters posted to England before they received replies to letters posted to ports on the north-west coast of their own state. This speeding up of mails has been a very big factor in encouraging the mail traffic, and also the passenger traffic has grown considerably, although it is seasonable. At times very keen competition exists for the securing of seats by air, and tickets sometimes change hands at enhanced prices.

Amongst the freight carried by this service are many items of special interest, and the most varied assortment is carried regularly every week. Medicines form a very important part of the regular freight, and important motor-car parts, from back-axles to magnetos, etc., also shearing machine and stationary engine parts, boring plants for oil and water, and regular consignments of day-old chicks, etc.

The operations of the West Australian Company have been so successful that the twelve-monthly contracts originally entered into for the first two years have now been supplemented by a three-years' contract with the Federal Government.

It will not be long before Australia is completely encircled with regularly operating aerial mail routes, and from these routes will radiate other routes to inaccessible and outback townships which at present suffer considerably from lack of communications. It is only necessary to glance at a map of Australia to appreciate the great opportunities that have been grasped by the Australian Government in using aircraft to such advantage in this great continent.

It was in March, 1921, just about the opening date of the Sydney Royal Show, that I arrived in Sydney with the Avro Baby. The machine was immediately sought after by the Australian Aircraft and Engineering Company, the only exhibitors of aircraft, upon whose stand it was placed on exhibition for the week. Here it claimed the particular attention of thousands of country visitors. The stand, it should be noted, was simply a roped off space with no protection at all from the burning sun by day and the heavy dew by night. The week following the Show, the heavens opened and let down great quantities of rain. Fortunately for the location of the hangar at Mascot, it remained an island, while to reach it across the aerodrome I had to wade in half-way up to my knees. Here the "Baby" was erected, and I made some flights round Sydney to satisfy

myself of the consumption and performance in the atmosphere of Australia, then it was only a matter of waiting for the passing shower before I could proceed on my way home.

Just before dawn on April 11th the Green responded to an initial movement of the prop, and with the only person in the vicinity—the night watchman—still asleep, I made my departure. I cannot imagine a great city picturing peace and rest as Sydney did that morning. The smoke from the buildings of the few early birds rising so lazily that it might not have known whether to go up or slide down again. Not a ripple on the whole of Sydney Harbour, and the sky cloudless, visibility extending right to the horizon in all directions. Taking a direct course my route lay for many miles right up the centre of the great dividing range, the highest point passed over being Ben Lomond, 5,000 feet. On approaching the mountains I managed a snapshot or two, which shows the appearance of this part of the country. Heavily timbered and practically uninhabited for miles, the hills in the picture range between 3,000 and 4,000 feet. For about 100 miles after taking this picture the same kind of country lies ahead. I don't remember seeing even one solitary house, and certainly nothing in the way of a road. After meeting the main Sydney-Brisbane railroad running along the tableland, the country becomes fairly open. Another picture I secured shows one of the small towns in this district, and is typical of the country town in Australia. Soon after ten o'clock cumulus clouds forming hid most of the ground from view, and it was not until I had crossed the border into Queensland for some distance that I once more had the sky to myself. After passing Toowoomba almost until I reached my destination there is a recurrence of the heavily timbered mountainous country, nothing but wild forest as far as the eye can reach. Somewhere on this final 200 odd miles I cross a solitary railway, which is practically the only man-made landmark to pick up. On reaching Bundaberg I found that the small allotment known as the Foundry Green had not been built on in my long absence, and, fortunately, the only intimation of my intended arrival was the regular purr of the Green engine overhead. I had the total space of approximately three acres to myself. On landing, without dismounting, I ruddered round and taxied along the street, finally pulling up at the front door.

During the fortnight I spent at home the town was in the grips of aviation. On more than one occasion places of business were closed to enable employees to see the " Baby " perform. Several of the outlying districts were visited on behalf of one of the local newspapers. On account of the arrangements, practically all these flights had to commence right in the heat of the middle of the day, and I was particularly surprised how little the performance of the machine suffered. Although the shade temperature was in the region of 100° F., the cooling of the engine was still satisfactory.

From when the machine left the shelter of the Mascot hangar until its return about three weeks later, it was exposed to all the elements; the best

protection it had during that period was that offered by a friendly gum-tree. The same conditions beset any aeroplane on tour in Australia, except on the now established air routes. The extreme heat of the day, coupled with the dampness of the night, causes deterioration to be somewhat rapid. While at Mascot the one and only hangar already being taxed to its fullest limit, a sorry looking B.E.2E., being the one too many, had to be parked out on the aerodrome. When I saw it, it had passed through weeks of rain and hot sun, with the wings flapping about like any old derelict round at the back of the A.D.C. You can judge my surprise when I heard later that it had been flown away and had once again began to take life seriously.

The absence of hangar accommodation for aircraft adds considerable difficulty to their operation out in the country. One stout little band, calling themselves The Aero Advertising Syndicate, says that they lost more time safeguarding the machine against weather and roving stock than they spent in the air. Although they carried some 70 yards of barbed wire fencing and erected it about the machine at each stopping place, the Avro was twice damaged during the tour. At Tumut a bullock trampled down the wire entanglements and horned the rudder, ripping the fabric; at Cowra the machine was attacked by horses and partly eaten. So-called night watchmen engaged to watch the machine almost invariably wander off during the night or go to sleep. The syndicate now resorts to the use of cattle dogs, tying one to each wing tip and a third to the tail of the machine.

Quite a number of Australian squatters have welcomed the introduction of aviation, and by acquiring a machine or two they form the principal and most important type of private owner. In practically all cases the machine has been delivered in Sydney, and the owner gets his new possession away to its future address, which is generally well over a thousand miles away, as best he can. One might say the only possible means is by air. Here is one such delivery, which is typical: The machine, an Avro 504 Sunbeam Dyak, piloted by T. H. A. Treacey, with the owner, P. Hogarth, left Mascot aerodrome on May 3rd, 1921. Perfect flying conditions prevailed, and progress was further assisted by a light southerly, and with two stops Moree—400 miles—was reached in 4½ flying hours. After two days, during which the owner attended to some business transactions, the flight was resumed to Balgowrie Station, the property of Mr. Hogarth. At this place the usual method for the mails is to go to Toowoomba by road, about 35 miles, and then get them personally. On this occasion, owing to the recent heavy rains, and the presence of the machine, the mails were flown over, the complete journey being done in less than an hour. Apparently local interest was so strong here that Treacey was kept busy giving all and sundry their first joy-rides. Continuing the journey, the next stage was a non-stop flight of 430 miles to Morven. Next day from Morven they reached Longreach, then, in company with a Quantas machine, 1¾ hours brought up Winton. A final flight of 65 miles, and the Avro Dyak had reached its destination at Clio.

The log showed a total distance of 1,845 miles, and the flying time 20 hours.

Here is just one experience of how the owner appreciates the extraordinary usefulness of the aeroplane in Central Queensland. On one occasion he was concerned by the non-arrival of some truck-loads of timber. Ordinarily a car run over to Clio Railway Station would entail a whole day's journey over indifferent roads. On this particular occasion the Avro was flown over. Flying low, but without alighting, the particular timber trucks were recognised, and, thus reassured, they returned to the homestead, the whole non-stop flight occupying less than two hours.

He proposes to use the machine for such purposes as the location of bush fires, spotting out the general topography of the country, removing patients to medical assistance or vice versa, and the transport of mails when the roads become impassible. He considers the Avro will be of inestimable value in locating the exact position of sheep in vast paddocks. When their position can be ascertained the sheep can be mustered in a few hours, work which in ordinary circumstances would occupy the boundary rider several days.

Another episode of the aeroplane occurred when the flood waters rose and invaded the Garah (New South Wales) district. An important grazier in the locality discovered that a flock of sheep valued at approximately £7,000 had been cut off from the low-lying country, and were isolated on a small ridge some 30 miles from his station, and but about 50 acres in extent. At the time this story opens the sheep had been already marooned for about three weeks. Having consumed every blade of grass on the ridge they were now threatened with starvation, resulting doubtless in total loss. A couple of joy-riding aeroplanes were operating within a hundred miles, and the grazier, getting into touch with these, managed to arrange for the aerial delivery of fodder to the starving flock. The airmen undertook to carry 60 or 70 bags of maize (each weighing 162 lbs.). Aerial delivery was commenced at once; the pilot, being directed by a station hand, made the first trip with two bags of maize in the rear cockpit. The delivery of five tons was carried out in 30 to 35 flying hours, resulting in practically the entire flock being saved.

When the Quantas people started off, having to operate their low-powered machine in the hot weather, they found many difficulties. In the dead air of the tropics a high-powered machine is essential; first to get off the ground and then to attain the cooler altitudes before the radiator boils away. Some idea of the conditions during the torrid season may be obtained from the fact that when the mail plane—an A.W.160 Beardmore—took off at Charleville for the northern run to Longreach on an occasion in January, the early morning shade temperature in the hangar stood at 108°. As an almost inevitable result the A.W. arrived several hours late, after a prolonged wayside halt for the cool of the evening. On the following day, by way of contrast, a cool southerly sprang up, and blew the same

machine from Longreach on the next stage, making a speed of over 100 miles an hour.

The blacks usually regard the aeroplane as a " motor car b'longer sky." At one of these out-back places where the '50 would be calling, one of the niggers, somewhat superior by virtue of having at some time previous been employed by West Australian Airways, explained to his less fortunate kind what to expect when the aeroplane should arrive in these terms:—" First time come small, like c'nary. Next time come big like sparrow hawk. Then big feller eaglehawk. And come down plurry eagle."