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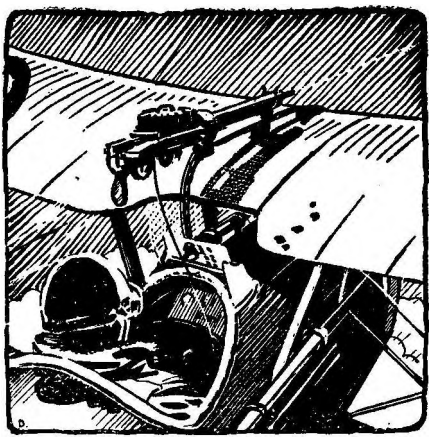

AIR STORIES

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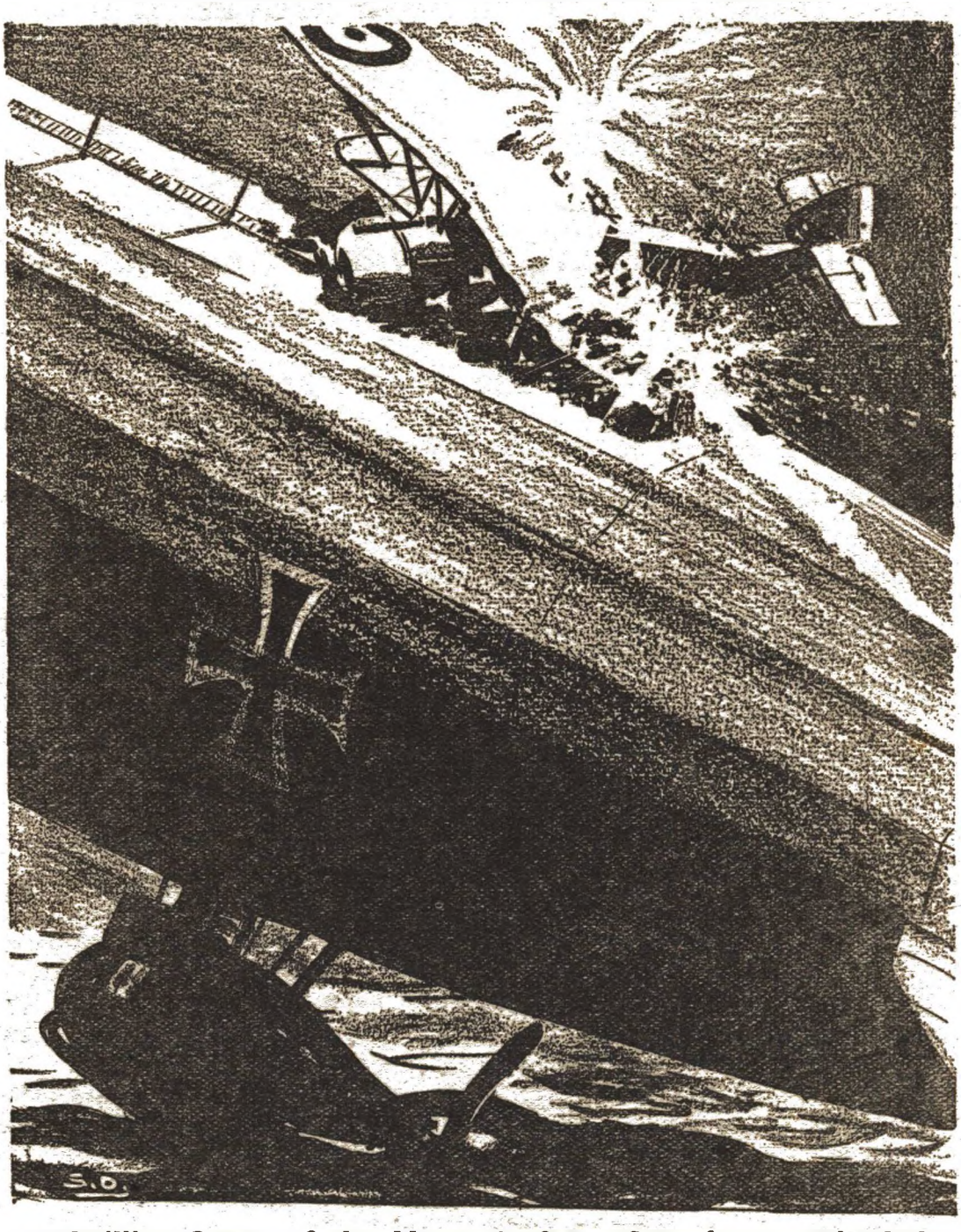
DEATH OF A HERO

A Long, Complete Air Story of War-time Adventure



A Thrilling Story of the Home Defence Squadrons and of the Men who Hunted the Terror that Flew By Night

High in the Night Skies above a Darkened England, One Man Barred The Raiders' Way to the Capital— A Man whom Fate had Destined for High Honour, but at too High a Price

By G. M. BOWMAN

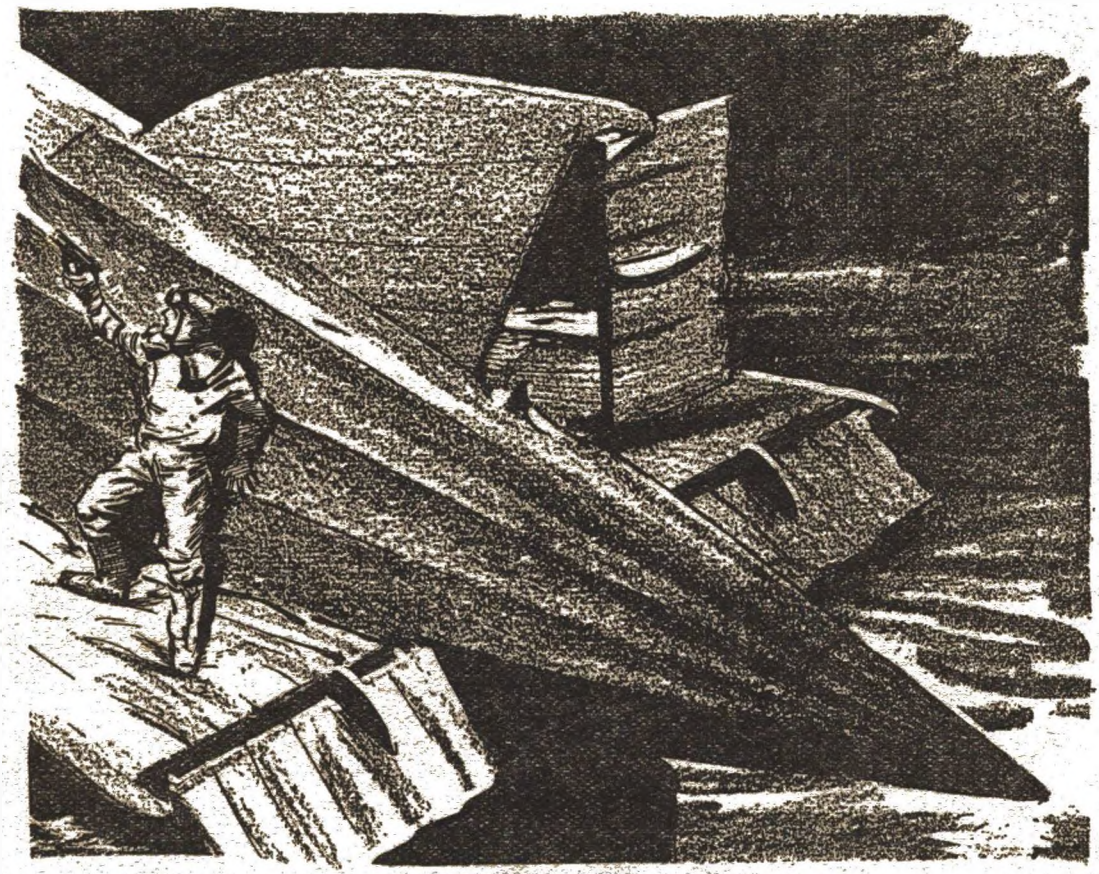
CHAPTER I

Defensive Patrol

THE vague, diffused end of a search-light beam caught Bill Taylor's One-and-a-Half Strutter for a moment, and Bill and the machine came out of a background of scattered stars like a photograph suddenly developing. Far, immeasurably far below, the livid Cyclops-eye of the searchlight marked an emplacement on Barnes Common, which Bill knew well, for his topography was as efficient as everything else he had taken up in life.

Like ripe berries on a crooked silver branch, the searchlights fringed the Thames and reached away across the black face of London. It was a picture of macabre beauty, which, till now, had been heightened by yellow gun-flashes from batteries stretching from Richmond to the Hackney Marshes.

Bill was glad that this artistic embellishment had come to an end. For the barrage of shrapnel, although carefully ranged so that defending pilots knew just where it would reach and could fly above the bursting shells, was never quite reliable. And an over-ambitious eighteen-



He levelled the Verey pistol at the wreckage of his machine and fired

pounder, full of T.N.T. and shrapnel, was no respecter of friends or enemies. . . .

Bill Taylor shivered, rubbed the back of a thickly-gloved hand across a blue-cold face, and looked at his petrol level. For the engine had suddenly begun to bang and "hunt." The gauge marked "empty."

"Good!" remarked Bill Taylor to himself, and pushed his stick forward cheerfully.

THE evening had been depressing, and the defence patrol a long one. Unfortunately, it had been a patrol exactly like every other of the past three months. A sudden warning, a run for the machines, and a take-off amidst floodlights which were immediately switched off, so that one found oneself rising into a vast arc of complete blackness. Then—nothing!

There had been a time, months ago, when Bill had been keen and enthusiastic, trembling with excitement at his first rocketing flight into the black battleground above the city of his birth. The raking searchlights, the high pock-marking of the shrapnel-curtain, round which he must fly until he was above it, the incessant gun-flashes, with here and there the greater flare of an exploding bomb—all of it had wiped from his mind those nervous worries and fears that can beset the most unimaginative man when on the ground.

In those early days he was glad he had been born into this period of the world's history. Glad that he was nineteen years of age and able to take part in the most terrific war of all time. For, like the rest of the world, he was firmly convinced that a conflict as big as this would mean the end of war. Once Germany was beaten, there could be no more. He was seeing and experiencing things that few men had dreamt of before him, and none would know in the new age of peace that was to follow.

But when those early days had passed, some of the zest went out of him. The immensity of the issues at stake was lost in the dull details of duty and routine. Opportunities for heroism seemed immeasurably remote.

Worst of all, the great black battleground of the London night sky was not a battleground at all. For Bill Taylor, in company with the rest of the Royal Flying Corps in England, was learning the first cardinal lesson of the new warfare—that you can't stop an air-raid!

The trouble was that you couldn't get to grips with the raiders. This was the sixteenth occasion on which Bill Taylor had taken the air, with highly organised speed and discipline, directly the raid warning had come through. Behind him he had the grim memory of fifteen other patrols, during which he had climbed into the heights above the barrage and had flown round until his emptying tank forced him to return home, with every cartridge still intact within his gun-belts.

Once, in the far distance, he had seen a faint silver shape caught in a searchlight beam, and known it to be a Zeppelin. A couple of fortunate men from the squadron at Brooklands had actually caught up with it and filled it full of holes, according to their own report. But in the dark they had lost it, and, during the weeks that followed, an unconfirmed report of an airship coming down and sinking in the mouth of the Elbe was all they received for their trouble.

For Bill Taylor's days—when Captain Leefe Robinson had yet to test the new tracer bullet and write a blazing finish to the short story of airships as offensive weapons—were bow-and-arrow days as far as the new warfare was concerned. In that spring of 1916, the first multi-engined, long-range, fighting bombers were only just beginning a stride destined to span the world.

Bill switched off, put the One-and-a-Half Strutter into a diving turn, and shivered again as he held the stick between his knees and beat his hands together.

He switched over on to the reserve tank and gave himself up to thought.

THE primary need nowadays was for faster machines. Tony Lurgan had been talking in the mess about a brand

new Sopwith which was coming along soon. One or two experimental ones had been tried out and, according to Tony, climbed like scalded cats. What was more, they had *two* Vickers guns firing through the prop. by an oil pressure synchronising gear, invented by a Roumanian. They had a dihedral angle on the lower planes only, and a French rotary engine with two mechanically operated valves to each cylinder. It all sounded very improbable, but the Honourable Tony Lurgan's information was usually pretty sound. At the War Office he had a noble elder brother—to use his own words, "upholstered in red, with gold trimmings"—who passed on an occasional tit-bit of secret news. Anyhow, that was the sort of machine they needed to get up to within eighteen and twenty thousand feet, before a Zeppelin could drop its load and clear off. Bill hoped it was coming soon.

The Honourable Tony had said something, too, about a rumoured explosive bullet. And that, to use a modern expression, hit Bill right where he lived. Defensive patrols of this kind were all very well. But even if one did have the amazing luck to get anywhere near a Zeppelin, one could not do much. One plugged in as many holes as possible, and hoped that the general loss of gas would bring the thing down before the crew could get it back across the Channel. Now, an explosive bullet—— !

In the days of his forgotten youth, Bill Taylor had practically completed a full engineering apprenticeship, taken a University Extension Course in the evenings, and gained a B.Sc.

In the war scare that led up to 1914 the quietly industrious Bill had also dabbled in ballistics, designed a new bullet contour, and read a paper before the Institute. He had even attained publicity to the extent of six-and-a-half lines in the general news-page of the *Daily Mail*.

Then Bill had met Millicent Fielding—and, for the first time in his life, realised that there can be things more perfect than precision instruments and the higher calculus. Then had come the War, and in the Royal Flying Corps Bill Taylor had received a hearty welcome, since the pundits thereof really wanted talent and knew how to use it. The less impulsive and more hide-bound veterans of the Army and Navy would probably have detailed him to experimental farmwork or made him assistant in a ship's hair-dressing saloon.

It was at once Bill's triumph and tragedy that he chose the least senior and most interesting Service, in which he was immediately given a workshop and told to go right ahead with certain little ideas he had happened to mention concerning a lightened machine-gun. In consequence, he was drafted to a Home Defence squadron, since he insisted on taking an active part in the game.

Bill thought now of explosive bullets, and he thought of Tony Lurgan Curiously enough, each subject was as complicated as the other. Concerning explosive bullets, apart from the technical difficulties, there were certain questions of international law which arose with the possibility of a bullet hitting a man instead of a Zeppelin envelope—which was more than likely ! Anything suggestive of "dum-dum" was frowned upon by all countries. So that was that.

The complication in the matter of the Honourable Tony Lurgan, lieutenant and comrade, was that he came from a different world from Bill's—a world so different, indeed, that it might have been in some remote constellation. In short, he came from "Society."

Bill swung across the River Thames and passed three thousand feet above the massed roofs of Chiswick and Acton. He pulled out his Verey pistol and sent a white light arching up in a request for landing lights at Northolt. The lights switched on—as usual, half a mile or so away from where he expected them, and a smoke-pot wafted its black stain across the glare to show the direction of the wind.

CHAPTER II

A Decision is Made

AS Bill came in, he saw that three other machines were before him, and

etched against the glare stood the tall, unmistakable figure of Tony Lurgan, shading his eyes in an effort to recognise the newcomer.

Tony was the son of a lord. He had an elder brother who was a lord, too. He had been to Eton and Oxford, and had left those temples of erudition with about as much accumulated learning, so far as Bill was ever able to discover, as the average council schoolboy of fourteen. He possessed good looks, a drawling humour which Bill could never have learned by any method of teaching, and unquestionable courage. He also possessed a shrewd knowledge of worldly things more fitting to a man of fifty.

Bill liked Tony Lurgan better than any man he had ever met before. Milly liked Tony, too. At first it had amused Bill to see how much more readily she had understood Tony's brilliantly lazy wit than he had himself. But women were like that. They were quick, intuitive. Then, suddenly, his amusement had begun to turn cold. . . .

THE landing was tricky, but Bill managed it without a hitch, even though his thoughts were far away. He knocked undone his belt and dropped down to the ground directly the mechanics had run out to take charge. Then he pulled undone his flying coat, pushed back his helmet and groped in the pocket of the oily, tattered G.S. tunic which, by economical habit, he always kept for flying.

He pulled out a cartridge-case, which had been broken open and in which the tiny brown bundle of cordite sticks looked like some fibrous plant. It suddenly occurred to him that the velocity of an explosive bullet should be lower ; that some kind of chemical theory might be possible by which the bullet would not explode, unless in the presence of gas—thus removing its dum-dum drawback as far as a human target was concerned. He decided he must polish up his chemistry. . . . And at the back of his mind, all the time, was the memory of how Milly had looked at Tony, last time. . . .

He staggered and nearly lost his balance as a mighty slap struck his back, and the voice of Tony Lurgan sounded in his ear.

"For heaven's sake!" said Tony plaintively. "Didn't I ask you to come back as soon as you could after we got the all-clear? And *did* I tell you there was a party on this evening, or didn't I? Here you've been flipping around with your engine putting the fear of God into the suburbs, long after the Huns went home! Oh-ho! I see what it is! You've got cold feet at last! You've decided to invalid yourself out!"

"You'll get invalided out," said Bill, swallowing, "if you wallop me like that again! I'm sorry, Tony—I mean about the party. I clean forgot. But what's the joke about getting cold feet?"

He put the cartridgeful of cordite back into his pocket as he spoke, but Lurgan cast his eyes skywards and heaved a mock sigh.

"The little innocent!" he said. "He spends all his time fiddling about with his ruddy inventions, and hasn't even heard of the noble and ancient art of Swinging the Lead! Great Snakes, do you mean to tell me you don't know that some chaps eat bits of cordite just before they go to see the M.O.? Don't you know that cordite gives your heart a kick, and makes it go nineteen to the dozen! Why, before the idea was spotted, dozens of heroes managed to get discharged from the Army with 'heart disease.' A few sticks of that stuff give exactly the same symptoms."

Bill moved towards the mess building.

"Trust you to know anything weird, wild and outlandish," he said. "If there's any truth in half the yarns you've told me, most of the wealthy men in high society are moral scoundrels, and their wives and daughters no better. If I didn't know what a leg-puller you are, I'd have to believe that half those people have no pride in fine names that are part of an ancient tradition—the sort of fine things that ordinary people imitate in their own small way."

"Well?" asked the Honourable Tony in a rather queer tone of voice.

"Well, my foot!" snapped Bill, turning towards his bedroom and pulling off his oily jacket. "You joined up like all the rest of us, didn't you? And all the people with big names and titles—they've joined up, too. Why, half the young nobility of England was wiped out in '14, when the Brigade was at Mons!"

His steady, honest face was slightly flushed and his hair ruffled as he groped for his braces.

"And, incidentally, that's why I've decided to stand out of the way between—between you and Milly," he finished. And felt as though a red-hot lump had risen up into his throat to choke him.

THE Honourable Tony Lurgan slowly tapped and lit a cigarette. In a second his face had gone dead white, and his hands were not too steady.

"You're a bit of a fool, Bill Taylor," he began at last, staring straight in front of him.

Bill laughed suddenly, not in the least conscious that he did so. Inwardly he was filled with a wild, bitter fury. But somehow that fury was not directed against Tony Lurgan or against Milly. It was just . . . fury. . . .

"We may as well settle this right now, Tony," he said. "You're in love with Milly, and she's in love with you. I know *you* haven't been doing anything behind my back, because both you and Milly are incapable of playing that kind of game. But I've seen it coming. . . ."

"Bill Taylor," said Tony shakily, "I give you my word of honour I'd rather fly straight into a burst of Hun bullets than——"

"I know you would!" said Bill. "But you're not going to—for Milly's sake." He shrugged into his jacket and, buttoning it up, turned to the door. "Listen, Tony," he said over his shoulder without looking round, "I'm not so upset as you might think. I'm not the right sort of man for Milly. I'm far too wrapped up in my—my mechanical ideas and things. You go along and take her to that party, and good luck to you both. You don't have to worry about me. My life's quite full enough as it is."

Bill went out and slammed the door behind him. He walked rather blindly, straight out into the darkness of the aerodrome. It was a very bare and a very empty place.

Bill Taylor had taken to lying too late in life to be really good at it.

CHAPTER III

Hunters of the Sky

BILL TAYLOR sat in a tattered arm-chair in the mess ante-room, apparently deeply engrossed in a motoring journal, the pages of which he did not consciously see.

For twenty-four hours he had not seen Tony Lurgan, for the very good reason that he had taken care not to see him. In one way, those twenty-four hours had been eventful, since they included Bill's first experience of getting really drunk, and his first experience of the more rowdy and ill-ventilated night-clubs in the West End of London. He had ended up with a spell in a Turkish bath, as providing the most convenient place in which to stay until it was time for him to be back at the aerodrome on duty.

He did not know whether Tony had obeyed orders and taken Milly to the party, and he was trying not to think about it. If he had any feeling at all, it was as though a bomb had exploded somewhere inside him and left him shattered and still.

But now, with a sudden instinctive movement, he jerked up out of his chair, dropped the motoring paper, and plunged for the door. Half a dozen other men in the ante-room did precisely the same thing at precisely the same second.

For outside in the darkness a gong was ringing, and its cold brazen note gave warning of a raid upon London.

As he clawed down a Sidcot suit in a corner of the hangar, Bill found Tony Lurgan beside him, also dressing feverishly. He forced himself to grin, but Tony grabbed his arm.

"Where the devil have you been?" asked Tony. "I tried to find you last

night, but you slipped away. They told me you had bagged a side-car, and gone to town."

"Went to see some friends," said Bill, dancing on one leg as he hauled on his suit. "Did you see—hope you had a good time."

"No, I didn't see Milly!" panted Tony. "But I want you to know I rang her up and told her I wouldn't have time to see her again."

For an instant Bill paused. An engine started up out on the tarmac, raising a hideous, asthmatic clatter.

"I told her I'd been transferred," gasped Tony, in a cracked shout. "And I'm going to be, Bill. I simply won't——"

The rest of his words were lost, for Bill did not wait to hear them. With the top of the Sidcot over his shoulders, he turned and ran out, groping through the darkness towards his machine. For one blind moment hope had flared in his heart, but it died as quickly. Nothing must be allowed to make any difference now.

He did not look round as he swung up into his machine and opened up the engine, waving the mechanics away without pausing to fasten his belt. Then, in the glow of the floodlights, he was pitching and thundering away across the aerodrome. Tony followed him, a bad second.

A QUARTER of a mile ahead, and slightly to the right, Bill Taylor climbed steadily. For a few seconds he switched on a small dashlight. With cool efficiency he studied the oil-pressure gauge, the tachometer, the pitot-dial and the compass needle. He looked round to check up on well-remembered landmarks, but found them obscured by a curtain of mist stretching a few hundred feet below. High above him a scatter of flashing stars marked the shrapnel barrage, and he swung up into a climbing turn.

All these things he did by force of habit. His mind was still a clamouring whirlpool, in which hope kept struggling to the surface, although he knew it must drown.

Twenty minutes later Bill Taylor's altimeter was marking close on fourteen thousand feet, and the flickering inferno of the barrage was beneath him. He flew straight across and above it, striking due east. He could see nothing whatever, but there was a faint thinning of the lower fog, in which shone the ghostly glow of the searchlights.

Then, like magic, the shrieking uproar of bursting shrapnel ceased.

Instantly he dived. No signals were visible from the ground, but a "cease-fire" like this nearly always meant that an enemy had been sighted at a lower altitude. The shelling was stopped in order to allow defence pilots to come down and get to grips.

Only once or twice had this happened before in Bill's experience. It was a chance—a big chance.

The sudden renewal of gunfire helped him, as it was intended to. Down through the wreathing break in the mist he dived. Very vaguely he could see the river below, but at the moment he had lost his bearings altogether. He flew in a wide circle, staring all around him. A vague, bulbous shape caught his eye and he swerved towards it, his heart beating fast. But it was only a cloud formation.

Then a flickering burst of shrapnel, well over to the east, caught his attention. He saw the searchlight beams swinging in that direction.

He let out a wild yell, for the shining unmistakable outline of a Zeppelin's tail was clearly in view as the great craft slid away out of the searchlight's beam towards the deeper patches of the mist.

For the first time in twenty-four hours Bill Taylor forgot everything but his job. He brought the One-and-a-Half Strutter round in a sixpenny turn, and then gave it everything in a blind race across the sky.

For the first time, he fired his gun. He pressed the trigger and let loose a couple of bursts of ten from the belt to warm up the oil in the mechanism and make sure that everything was ready for action. He glued his eyes on the disappearing Zeppelin ahead, and watched

The shining unmistakable outline of a Zeppelin's tail was clearly in view as the great craft slid away out of the searchlight's beam towards the deeper patches of the mist.

like a cat the whirling patch of mist into which it went.

For the next three-quarters of an hour he suffered bitter disappointment. He had lost the Zeppelin altogether ! Almost he had been within striking distance, but the mist was a cunning enemy against which he could not fight. Blindly he had thundered on, climbing at first, since it was only natural that a Zeppelin would climb in order to get out of danger. Above the mist bank he hoped to see it again.

But when he reached the clear air the sky was empty !

So, once again, he had gone down through the whirling, damp void, down and down until his altimeter was marking no more than a couple of thousand feet.

Still nothing showed, and at the back of his mind was a growing fury. Soon, he knew only too well, his main tank would be empty. The reserve would give him barely half an hour's flying. He had less than half an hour in which to seize the one magnificent chance that had presented itself and now looked like escaping him altogether.

His eyes were so strained that he was feeling sick. He stared above, below, and to either side. He swerved over and started a zig-zag course.

And then, out of the mist to his right, a grey, blank wall materialised. For a moment Bill was so taken by surprise that he could hardly move. It was only a few feet away from his right wing-tip, a vast, ribbed wall of dull grey fabric. One of the corners of it was torn, and flapping and slatting in the wind.

CHAPTER IV

Disaster in Mid-Air

BILL came to life, half choking as his heart seemed to rise up in his throat. He swerved away and came back again in a roaring, climbing turn. His thumb was on the gun trigger, and the venomous-looking Vickers flamed and thudded. A streaking line of bullet holes swept up the towering Zeppelin-side—then he was careening away over the top of the craft which had a curve like the dome of St. Paul's.

His tail shuddered violently and, as he instinctively kicked at the rudder-bar, he felt the control wires jam.

In that first second Bill Taylor did not realise what had happened, for, against the noise of his engine, he could hear nothing of the Zeppelin's catwalk gun, at which a three-parts frozen man had been tensely waiting ever since the sound of the Sopwith's engine had come close. The One-and-a-Half Strutter swerved violently and headed off at a tangent, leaving the Zeppelin far behind, whilst the frantic Bill kicked at the rudder-bar in an effort to get steering control.

Everything seemed to conspire against him. To lose his quarry like this, when luck had brought him upon it again !

Then, as Bill fought for control of the rudder, a succession of warning bangs came from his engine. With a lunge he jerked forward and switched over from the empty tank to the reserve.

It seemed to make little difference. The engine ran evenly for perhaps twenty seconds, then banged and panted again, actually running half a dozen revolutions in asthmatic spasms before picking up unevenly.

The explanation lay in a feed-line, partly severed by one of the bullets that had mangled the tail-control—but Bill did not know that, yet. He hardly felt relief even as the rudder-bar finally slid over, the frayed part of the wire at last coming through the pulley fairlead. Bill came round, trying to maintain his height, fearing the worst.

Then, for the first time, he realised two startling facts.

The first was that both he and the Zeppelin, which was now about five hundred yards away to his left, were clear of the mist. The second was that they were both over the sea. There was no doubt about it. Less than a couple of thousand feet below to the west was a clearly defined coastline. Bill's quick mind judged it to be somewhere either on the north or the south side of the Thames estuary. In three-quarters of an hour of full-bore flying with the wind

behind him, such a journey was more than possible. In his search for the Zeppelin, he had paid little or no attention to compass direction.

"I'll get him!" breathed Bill, glaring at that vast silver shape which was now slightly up-tilted, as though the commander were trying to climb back into the high layers of the mist. "I'll get him if I——"

Suddenly his engine fired again!

Bill Taylor was losing no chances this time. He half-shut the air lever, climbed fiercely and roared straight towards the Zeppelin's tail. His intention was to fly from tail to nose, and rake the full length of the great envelope with a solid line of bullets as fast as his Vickers could pump them out. That ought to cause such a loss of gas that the monster would never be able to get back across the Channel. And, with any luck, Bill was already thinking that he might be able to glide down and find some kind of naval authority to send out a destroyer and take the crew prisoners.

Then, as suddenly as it had re-started, his engine choked and died!

Bill saw the Zeppelin's tail swinging towards him. He was about fifty feet higher. He decided to take a blind chance, and took it on the instant. With any luck, he could glide the whole length of the airship and swerve away to avoid crashing into it if he lost flying speed.

He tried it.

Once again his Vickers roared and rattled. The great grey whaleback of the Zeppelin was directly beneath. He stared downwards, concentrating on judging his fast diminishing height. He did not even see the dancing red danger of fire from the catwalk gunner ahead. The first thing he knew about the oncoming bullets was a sudden crash and a wild vibration as his propeller collapsed and the stump roared, out of instant balance.

At the same time something burnt fiercely in his side.

Whether Bill jerked his stick in that moment of shock, or whether it was just a sheer lurch of lost flying speed, he never discovered. He knew nothing about the death of the catwalk gunner who, in the act of turning and jumping towards the ladder tunnel, was caught by the crossbar of his swooping undercarriage.

The vast bulk of the airship seemed to rear up dead in front of him, and the next moment the nose of his One-and-a-Half Strutter was ploughing through fabric and aluminium girders, finally to lurch up on end with wings buckling.

BILL came clean out. He came out because he was wearing no belt, and he plunged heavily into drooping fabric, falling with a jerk that made him feel as if his neck had been broken.

Dazedly he staggered upright, caught at his own broken propeller-boss for support, and tried to gather his senses. His side was throbbing and his head felt queer and cold.

Beneath the wreckage of the machine was a twisted machine-gun. Also beneath it was the top of the ladder tunnel, over the edge of which a dead body dangled.

The Zeppelin, now dropping at a dizzy angle, was already within five hundred feet of the sea, and still falling fast.

It was the nearness of the sea that first caught Bill's attention. He felt curiously isolated—like a man in a bad dream. The fact that there were other men on this stricken craft did not enter his head.

But down below, in the control car, the airship commander was bellowing orders furiously, and flinging overboard log-books, code-books and special instruments. Ever since an unexpected break in the mist had bared him to the searchlights above London and shrapnel had ripped his ballonets full of holes, he had been fearing the worst. As he made for the coast, he had dived down into the lower mist in the hope of avoiding defence aircraft.

Now the worst had happened. Under his sensitive touch he could verily feel the great craft breaking up.

Bill could feel it, too. He had come to his senses sufficiently now to decide that he had made a complete and utter mess of this job. The airship was carrying

no lights, there was no sign of shipping, and nothing that gave a hope of salvation anywhere along the coast. Certainly, he had finished the Zeppelin's career, but in doing so he had undoubtedly finished his own.

And in this strange, unreal and wild moment, Bill very badly wanted to live. The picture of a girl had suddenly become vivid in his mind.

"I'll try it," breathed Bill. "They're bound to see the flare."

Heaving himself up across the battered nose of his machine, he groped down in the cockpit and wrenched out the Verey pistol. His side hurt fiercely, and he felt dazed and sick.

But, with the pistol in his hand, Bill leapt down, dug in his heels and slid and shuffled his way down the slanting angle of the stricken Zeppelin, towards the tail.

It seemed as if the tail were almost touching the water, and it was a giddy sight. Bill Taylor had to concentrate on keeping his head as well as his hold. He gritted his teeth, and his fingers dug through the fabric like hooks.

The drooping tail actually touched the water, and the Zeppelin gave an upward bounce and a heeling turn which very nearly sent him off his balance. But it was still moving forward, carried by the wind. Bill saw that if he dropped off it would go on ahead and leave him behind.

He grabbed the big fin and swung himself down, so that his feet rested on one of the huge elevators. Then he turned, levelled the Verey at the tilted wreckage of his own machine, and fired.

THE red, spluttering ball of the Verey cartridge struck squarely into one of the lower wings of the wrecked One-and-a-Half Strutter and hung there for a second, a blistering crimson blossom. Then it dropped, tearing its way through the wrecked girder-work and tattered fabric of the Zeppelin below.

Bill jumped as it did so. He jumped clean off the big elevator and fell about forty feet into a black and rolling sea. But even before he touched the surface the whole sky above seemed to turn to daylight!

In that one vivid instant Bill saw what he, as a scientist, ought to have expected.

About twenty feet above the airship was a white blanket of fire—a vast stretch of whirling, writhing, yellow-blue flame which undulated weirdly.

"Of course!" thought Bill inconsequently. "He's been losing gas all the time from my bullet holes and the big tear where the machine struck. And gas won't burn until it's mixed with air. That's why the escape has caught."

He struck the water; and on the instant the undulating blanket of gas-fire seemed to strike down like a cloud-burst at the rent beneath Bill's machine. The Zeppelin disappeared, and a rolling gushing ocean of flame thundered into being and blotted it out from end to end.

Seven or eight feet beneath the black surface of the water, Bill Taylor became conscious of that glare. He was floundering wildly, fighting to keep beneath the surface as long as he possibly could, and so avoid the blasting sweep of the heat.

But his buoyant, air-filled Sidcot suit took him up like a bobbing cork. He broke surface, was deafened by a roaring crash of steam, and blinded by a heat-blast worse than he had ever imagined.

Even then he had sense enough to kick over in the water and try to force himself down. He managed the first few strokes, came up again gasping with pain, and found that the heat was no longer unbearable.

For the blazing mass, still carried by the wind, was now a full hundred yards away from him. Actually, the airship, a skeleton of glowing girder-work, was three-parts beneath the surface, and sinking fast. All that remained was a boiling mass of water, surrounding vast bubbles of flaming gas which came whirling up with thunderous effect.

Bill choked. He had swallowed the best part of a gallon of water, his head was rocking and throbbing, and he felt as though he had broken every bone in

his body. Yet with an effort he steadied himself. He trod water and started hauling his arms out of the now water-logged Sidcot suit.

Then he swallowed a lot of water all over again as he let out an instinctive yell of delight.

Far away on the coastline, lights had appeared. They were moving lights. They were coming out across the water with their beams focussed ahead.

For Bill Taylor had given his little firework display less than a mile off the darkened town of Sheerness, where the naval authorities had been following with interest the sound of the airship's engines and his own.

Now a couple of C.M.B.'s with searchlights blazing were racing out, tearing along high up on their hydroplane steps as fast as their big Thorneycrofts could drive them.

CHAPTER V

Death Rides the Waves

BILL went under twice before he finally gave up the attempt to rid himself of the Sidcot. His neck was hurting badly, and that queer pain in his side was worse than ever. It was a pain that seemed to go right down his left leg. What was more, it seemed that water was constantly getting up his nose. He gasped and snuffled—moved his arms just enough to keep above the surface, and left things at that as the oncoming searchlights raced nearer.

"I suppose I've got knocked about," he told himself, and then, blotting out all the pain, an instinctive, hysterical laughter swept over him. "But I got that damned Zeppelin. I fired him. I got him!"

Bill Taylor felt more than hysteria. His mind was growing slightly disordered now, but he could still think—and hope. He had got a Zeppelin, he had got it. It would mean a decoration. His name would be in every newspaper. He would be famous.

Fame that he had earned, a name that he himself had built up, not just inherited. And fame could mean such a lot, quite apart from the fact that any girl might be proud to share it. Fame could mean that influential and wealthy men would be more inclined to give him a hearing, look at his designs, back him. It could mean wealth, position, things as good as any son of nobility could offer a girl. . . .

WHEN one of the swerving C.M.B.'s caught him squarely in its searchlight and careened round to a standstill to pick him up, Bill was still babbling.

"All right, matey!" said a burly rating, who had him beneath the shoulders, hauling him on board. "All right, don't you worry. You're all right now!"

"Get a bit of it!" said Bill in a suddenly clear voice. "Get a bit of it for Milly. Get anything you can—there must be something floating. . . . Gosh! my neck hurts!"

His head was drooping awkwardly as the burly rating finally got him on board with the help of another, and then carried him down to the tiny after-cabin.

"Bleedin' like a pig, 'e is!" gasped the man. "Blimey! Better tell the Skipper. This is the bloke what brought down that Zeppelin, and we ought to get him ashore to a doctor, pretty smart."

The other man nodded and jumped up on deck.

Forward by the tiny bridge, he jerked a salute to the young sub. who stood muffled in oilskins at the wheel.

"It's the flying gentleman, sir," he said. "And he seems to be hurt bad! Nobby—'er—Leading Seaman Clark reckons he ought to see a doctor pretty quickly."

The sub. nodded. "If we've got the chap who shot that Zeppelin down, we're certainly not waiting," he said. "Byam can wait about and see if there are any floating Huns. All right, make him as easy as you possibly can. If he's bleeding, don't give him any brandy. In fact, don't do anything but keep him comfortable. We can have him ashore inside ten minutes."

Bill was unconscious long before he was finally lifted up on to the Sheerness

quay on an improvised stretcher. At the hospital he was rushed straight into the operating theatre, after a brief examination by two doctors who exchanged grave glances.

But the glow of that falling airship had not only been seen by the naval authorities. Reporters were at the hospital keeping telephone lines open to London, before the doctors gave their verdict. From an orderly officer they obtained the details of Bill's personal papers. The home aerodrome at Northolt was notified. As in special cases of this kind, a notification also went straight to the War Office, to Buckingham Palace, and to the House of Commons.

Bill had timed things well, according to Fleet Street canons. The complete news of the burning of the Zeppelin was telephoned just in time for the first morning edition of the national daily papers.

CHAPTER VI

Choice of a Hero

AT eight o'clock that morning a slim girl with a face as white as a sheet got out of a taxicab at the Sheerness hospital entrance. In her hand was a morning paper—and with the limited details at their command the staff of that paper had done well.

"ZEPPELIN BROUGHT DOWN IN FLAMES BY R.F.C. OFFICER"

ran the headlines in two-inch letters, followed by the report :—

"Just after midnight last night, Lieutenant W. Taylor of the Royal Flying Corps, stationed at Northolt, attacked and brought down a Zeppelin which fell into the sea off Sheerness.

"Seventeen of the airship's crew of forty were saved and made prisoners of war. In carrying out this heroic deed, Lieutenant Taylor's machine was disabled and crashed into the sea. He was picked up by a naval craft, and now lies in Sheerness Naval Hospital. Up to the moment of going to press the extent of his injuries is not known.

"It is learnt on good authority that he will be recommended for the Victoria Cross.

"Lieutenant Taylor was born on June 1st, 1897, at No. 7 Werter Road, Putney. . . ."

The girl ran up the steps, but just inside the hospital she stopped and caught her breath. For the Honourable Tony Lurgan, who had arrived only a few moments before her in a Crossley tender, was standing talking quietly to a surgeon in a white coat.

As he caught sight of her, Tony stepped forward. For a moment their eyes met, and his lips moved silently, as though words would not come.

Then he managed to speak.

"Milly," he breathed. "Milly—he wants you——"

"Are you Miss Fielding ?" asked the doctor. "We've been telephoning for you. He has been asking for you constantly, and your arrival may make just the difference."

"I came directly I saw the paper," she said, and tore her eyes away from Tony's face with an effort. "Is he—is he—— ?"

"I'm afraid it's touch and go," murmured the surgeon, taking her arm. "There are two bullets that we dare not even probe for. He's lost an appalling amount of blood, and there's a base fracture. Now, I don't want you to talk at all if you can help it. Just let him see you. I shan't allow you more than a few seconds."

Millicent Fielding swayed slightly. Behind her, Tony reached out a hand instinctively, but checked the movement. She moved on.

Outside a door, above which was a large open fanlight, the surgeon paused and held up a warning finger.

"Whatever happens," he said softly, "whatever happens, we have to guard against any acceleration of the heart. He must not have the slightest excitement. If the heart-beat goes up he'll slip through our fingers in two minutes. In any case—I'm sorry to have to tell you this—but in any case it's going to be a long job. Poor lad. I'm afraid he'll never walk again, and there's almost a certainty of general paralysis as he gets older."

Millicent Fielding seemed to stiffen. She half-turned, but then, chin up, she moved to the door.

Inside the room Bill Taylor lay very still. His head was held steady between sand-pillows. He hardly seemed to breathe, and his skin was a ghastly leaden hue.

Only his eyes were alive—his eyes and that queer, acute sense of hearing that always comes to a man, powerless in other ways, who is hovering on the verge of death.

As the door opened his lips moved slightly, but he said no word. It was as though he sensed the movement of that slim form across the room. Then a small, gloved hand rested upon his own as it lay upon the counterpane.

"I'm going to be a bit of a wreck, Milly," said Bill in a slow, faint voice. "I'm going to be a nuisance . . . just a helpless lump in a bath-chair. . . ."

Millicent Fielding's face was almost as grey as his own. Her eyes were filling.

"You're going to get well," she breathed. "I'm going to make you well, Bill. Once you can leave this hospital, I'll never let anyone else nurse you. There's so much you always wanted to do with your life. There's so much you're *going* to do with it. . . ."

"Yes," murmured Bill, and his limp fingers tightened on her own. "I knew you'd say that. You see, I *can* do something with my life. . . . But now . . . I want to sleep."

Over his face came a queer, twisted smile. Millicent bent and kissed the hand she was holding, very gently. Then she tip-toed across the room and out of the door.

IN the small room there was silence as the surgeon held Bill's wrist and smiled down cheerfully, as though such a thing as taking a pulse was furthest from his mind.

"Feel better now?" he inquired. "Wonderful girl, that. Worth getting better for."

Bill made a somewhat unexpected remark.

"My explosive bullet," he said. "Thanks, Doc., but somehow, lying here, I've thought of something. I want that cartridge. I want to hold it. You'll find it in the old G.S. jacket I was flying in when I crashed. . . ."

"Can't you keep quiet for a minute?" smiled the doctor, still in his soft, comforting voice. "I should think you'd had enough of explosions. All right, though understand you're not to try and fiddle with anything. I'll bring it to you. But sleep's what you need."

Bill was very much on the border-line, and the doctor, who had a deeper knowledge of psychology than he would have admitted in those early days, went quietly out of the room and spoke to an orderly. Within ten minutes Bill's old G.S. jacket was brought to him, and the doctor carried it into the room, fumbling in the pockets. He brought out a cartridge-case in which there was still a bundle of loose strands of cordite.

"Here, I'm letting you take your dolly to bed with you," he grinned. "If I really did my job, I'd tell you not to think about anything at all. Still, maybe——"

He slipped the cartridge-case into Bill's seemingly nerveless hand. The fingers tremblingly closed around it. The patient seemed relieved. Still as helpless and immobile as a statue, a tiny smile fluttered round his lips.

"Thanks, Doc.," he breathed. "thanks. Now I can sleep. . . ."

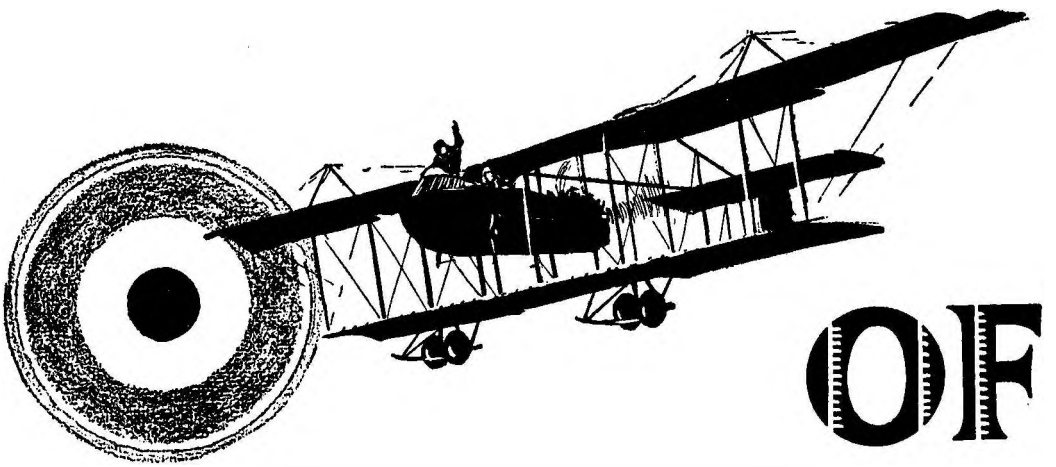
THE cartridge-case was still in Lieutenant William Taylor's cold, motionless hand when the surgeon came back into the room half an hour later. The tumbled brown sticks of cordite in the brass case seemed just as they had been. Naturally enough, there was no telling whether there were a few missing. . . .

"Slipped away!" breathed the doctor. "Slipped clean through our fingers. Now, why the devil! So long as there was no acceleration of the heart—and Heaven knows I've done everything to keep him quiet, in body and mind. . . ."

Gently he took the cartridge-case out of the stiff, unmoving grasp.

He looked at it, and it meant nothing to him, nothing whatever.

FALCONS OF



The True and Enthralling Story of the Part played by the French Air Service in the World War in the Air

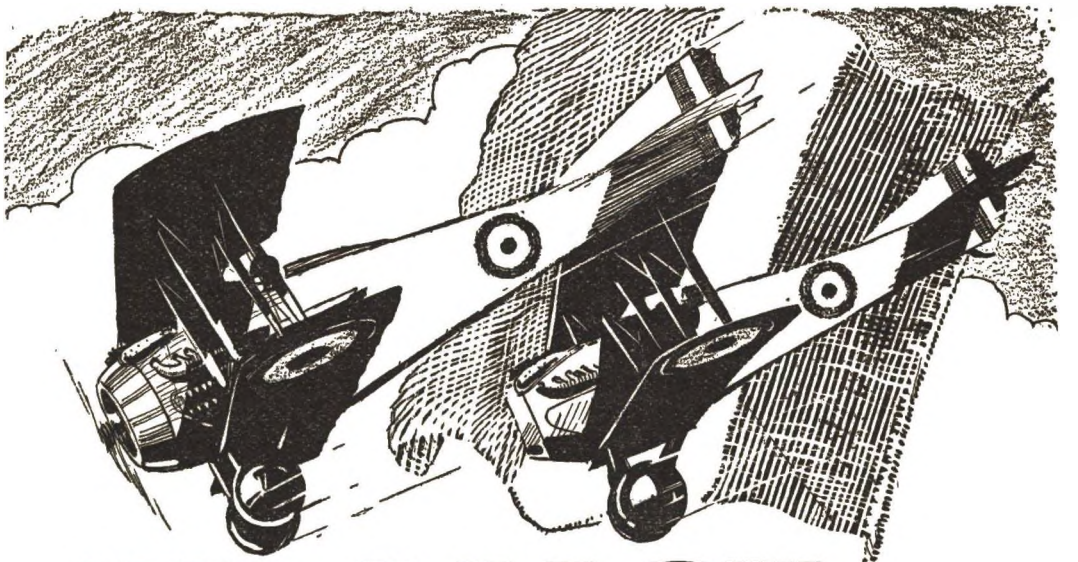
IN a recent issue AIR STORIES printed the war-time history of the Imperial German Air Service under the title of "Wings of the Black Eagle." Now it offers the story of their hereditary enemies—the French Air Service. During the Great War the German war-birds fought their English counterparts with a more or less friendly rivalry, with Death ever waiting to claim the loser—but they fought the French with something that closely approached hatred. For years these two great nations have snarled and glared at each other, despite countless "scraps of paper" compiled by their respective statesmen. Their feud is a long-standing one, the origin lost far back in the mists of history, and the end is not yet in sight.

The valiant deeds of France's enemies in the air have already been recorded and here is another side of the picture, the stirring story of France's gallant airmen during those four years when the World went mad—the blackest years in history, 1914–1918. *This story should destroy the idea held by many of the younger generation, who are apt to look upon the Frenchman as a small, excitable, perfumed dandy. Four years of blasting guns, sudden death and battered countryside have made the French anything but dandies; they became, in truth, Falcons of France.*

France Spreads Her Wings

NO country in the world was more impressed by the first flight of the Wright Brothers than was France. Aeronautics had been studied there since 1850, and it was not surprising that, once a machine had actually flown, the French should quickly enter the limelight as clever designers and wonderful pilots.

Several companies were formed to manufacture the new flying machines, and among the first of these was the Bleriot concern. Little is known in England of Bleriot's work except that he flew the Channel on July 9th, 1908, in a machine of his own design, powered by a 25-h.p. Anzanzi engine. Actually, Bleriot opened his factory early in 1906 and had designed half-a-dozen types of machines before he flew the Channel. Santos-Dumont, Henri and Maurice Farman, Caudron, Nieuport, Deperdussin and Morane-Saulnier were other pioneer



FRANCE

Compiled from the Official Records and Specially Written for "Air Stories"

By A. H. PRITCHARD

contemporaries of Bleriot and, by the winter of 1912, some sixteen firms in all were engaged in the manufacture of aircraft.

Amazing progress was made, and by 1909 every worth-while aviation record was held by a French pilot or a French machine, as was also the case in 1910 and 1911. The 1911 records were: the altitude record of 13,943 feet, held by a Bleriot, piloted by Roland Garros; the distance record of 212 miles, held by Prier, also in a Bleriot, and the duration record of 11 hours 1 minute 29 seconds, held by Furny, and achieved in a Maurice Farman. These records seem to have been highly prized by the French authorities, for in 1912 they granted the huge sum of £1,280,000 for the holding of these records. Two records soon went by the board, Garros breaking his own record in December with a height of 19,032 feet, and smashing the distance record on September 23rd, 1913, when he flew from France to Tunis, North Africa, a distance of 588 miles in 7 hours 47 minutes. This record was again broken five weeks later for, on October 31st, Eugene Gilbert covered the 608 miles between Villacoublay and Pomerania in 7 hours 28 minutes.

Another French pilot to win fame about this time was Alphonse Peguod, who won immortality as the first man to loop the loop. But it was fame that belonged elsewhere for, contrary to the popular belief, Alphonse Peguod was *not* the first man to loop the loop, a feat then regarded as a sheer impossibility. The true hero was a certain Lieutenant Chanteloup, who took-off in a Caudron G.2 and made five perfect loops over Issy aerodrome. When he landed his C.O. coldly informed him that a repetition of this foolish stunting would result in a court-martial. The very next day he took-off from Buc and made ten loops, ran his wheels across a hangar roof, and flew back to his own 'drome at Issy. Despite the congratulations of the officer in command of Buc, Chanteloup was arrested and charged with

endangering military property. Peguod, who at that time was test-pilot for the Bleriot Company, tried his hand at looping a few days later, and came down to find himself world-famous. So it was that military red tape robbed Chanteloup of the fame that was rightly his, and handed the glory to Alphonse Peguod.

The First War Balloons

FRENCH military aeronautics can be traced back to 1870, for when the Prussians attacked Paris, balloons were used for observation, bomb-dropping, despatch-carrying and ammunition transport. Incidentally, it was against these balloons that the first anti-aircraft guns were used, for the Krupp factory in Germany produced a high-angle gun for use against the bombers. A special French balloon service was maintained right up to 1910 and was commanded by General Hirschauer, the four sections performing valuable service during the Moroccan War.

On February 1st, 1910, the Aero Club of France informed the French War Cabinet that the aeroplane had great possibilities in warfare, and three weeks later the French Air Service was formed, its first flying officer being Lieutenant Cameron, who took his *brevet*, or pilot's certificate, on March 9th. Again acting on the advice of the Aero Club, the French Cabinet held the first aerial manœuvres at Picardy in September, and General Rocques was appointed the Air Service's first commander on October 20th. Throughout 1911 a long series of manœuvres was held, and at Mailly experiments were carried out with wireless and artillery co-operation, which may be the reason why so many of France's early military pilots were ex-engineers and artillery officers. Early in 1912 the first census of military aircraft was taken, and the Air Force was found to possess 208 first-line machines. This number was increased to 374 by the end of the year, and these were flown by 432 pilots and maintained by a personnel of 2,172 officers and men. Still greater strides were made during 1913, and in March of that year a Naval Air Service was formed. Some 160 machines were acquired, chiefly of the F.3.A, Nieuport and Caudron types, and most of the 116 pilots who flew them seem to have been N.C.O.'s or sportsman-pilot reservists. Orders were placed for an additional 250 machines, but very few were delivered and after a great scandal had arisen over the misappropriation of the funds, another £250,000 had to be granted before the proposed expansion could get under way.

Great attention was given to the choice of flying-fields, the chief ones being at St. Cyr, Villacoublay, Pau, Juvisy, Issy le Moulineaux, Le Bourget, Buc and a naval station at Juan-les-Pins. The principal testing and training centre was at St. Cyr, and as it remained so throughout the war, it may be of interest to note the reason for its original choice. A report was issued to the effect that "In case of war pilots will have to land on rough broken ground, and should therefore be trained under circumstances as closely approaching war conditions as possible." Actually, the original field at St. Cyr was a pilot's nightmare, being entirely covered with broken tree stumps, small bushes and small hillocks. No one can say the French were not thorough in their training.

Buc was also a great training centre, and the Farman and Bleriot schools there were instrumental in training many good military pilots. In addition to these fields, there were another fourteen which had accommodation for airships, containing in all some twenty-four sheds. Each field possessed a fleet of lorries, two breakdown vans and a traction engine, the men being trained to dismantle the sheds and load them ready for moving within two hours.

The Outbreak of War

WHEN the great god Mars finally unsheathed his sword and let the Hounds of War loose on an angry world, the French *Aviation Militaire* consisted of roughly 830 aircraft in good condition, with 850 pilots to fly them and 28 airships

with 31 fully qualified pilots. Its total personnel was 4,732 officers and men.

The machines consisted of the usual motley array that was so familiar at this period, the best known types being the Henri and Maurice Farmans, the Caudron G.2, two Bleriot models, a few Morane-Saulniers, one type having Gnôme 80-h.p. engines, and another, 60-h.p. Le Rhônes. To round off the collection there were about thirty Voisins, powered with the 140-h.p. Canton-Unne engine. This force was divided into *escadrilles*, each of eight machines, and in this the French seem to have had more foresight than any other belligerent, inasmuch as they issued only one type of machine to each *escadrille*, the initials of the type being inserted before the official squadron number, for example, N.3 was *Nieuport Escadrille* 3, M.S.23 was *Morane-Saulnier* 23, and so on. This segregation was a great help towards efficient maintenance, as the mechanics had only one type to work on, and did not have to tinker about with a dozen types of rigging and engines, as did the British and Germans. None of the machines had any reliable instruments, but as a French writer puts it, "All types were provided with a compass in front of the pilot and also sketching apparatus for the observer." And no doubt the P.B.O.'s and their pilots made good use of these, relieving the monotony of patrols with many a quiet game of noughts and crosses !

Haphazard flying was the rule with the French, as elsewhere, but France had at least taken a step in the right direction, and was the first Power to do so, by segregating two types of machines for special work—the Voisin for bombing, and the Morane for all scouting duties.

The war was only three weeks old when the *Aviation Militaire* had to file its first casualties—the first two towards its final total of 8,225. A close scrutiny of the official records reveals that the first French airmen to fall in action with the enemy were Captain Sailler and Lieutenant Le Galle, of the *Escadrille Maurice Farman* 28. Whilst on a reconnaissance flight in the Champagne region they were attacked by an Aviatik, a well-placed bullet from the observer's rifle penetrated their petrol tank and the Farman fell in flames.

Strive though they might, the French war-birds could not avenge their fallen comrades until October 7th, and even then the honour fell to a lowly bomber. On that date a Voisin piloted by Sergeant Frantz, with Adjutant Quenaut as his observer, was returning from a raid when it encountered an Aviatik busily taking photographs of an artillery park. Frantz immediately attacked, and after a swift exchange of shots, the Aviatik went down ; victory number one for the French Air Service. For his skill and daring, Frantz was awarded the *Médaille Militaire*, and was the first war airman to receive a decoration.

Peguod Drops a Brick

EVENTS now began to happen quickly, and during the month *Escadrille M.S.23* won fame through the number of combats it staged against hostile aircraft, such daring spirits as Gilbert, Peguod and Garros constantly engaging prowling Aviatiks and Taubes. On the 21st, Alphonse Peguod dived on an unwary Albatros two-seater and, dropping a brick through its propeller, shattered that essential piece of wood and forced the pilot to land his machine well inside the French lines. Two days later, a battery of the famous "75" field-guns, specially elevated for anti-aircraft fire, claimed the destruction of the first Zeppelin to fall in the war when it shot down the Z.8 in Alsace.

November saw the Air Service log its first night raid when, on the 16th, Lieutenant de Dreuille bombed Lorraine at 11.40 p.m., and flew his Voisin back home with one wing-tip shattered by an anti-aircraft shell that had torn it off without exploding. Apart from odd skirmishes and a few desultory bombing raids, there was only one other incident of 1914 deserving of special mention and that was the early experiments with machine-guns.

Late in November, Eugene Gilbert

began to tinker about with experimental gun mountings, and on December 7th he strapped a stripped Hotchkiss gun on the centre-section of his Morane and proceeded to shoot an L.V.G. full of holes. Even as his victim fell, the gun tore loose with the vibration and split Gilbert's propeller, but he landed safely and at once set to work on a new device from which he finally evolved the first primitive but surprisingly efficient interrupter gun gear.*

In the light of these experiments it seemed as though the French anticipated a great deal of excitement in the air during 1915, and the German Air Service must needs look to its laurels if it wished to survive the coming year.

1915

Rattle-trap Raiders

THE second year of the war opened with the French Air Service concentrating all its resources on bombing, and rapid strides were made in this direction. Bombing groups were the *élite* of the Service at this time, and many pilots who later became famous "aces" were proudly flying in the old rattle-trap raiders of 1915. Heurteaux was a gunner in a Voisin squadron; Madon, a corporal-pilot on Farmans; Dorme was flying Caudron G.2's, and Lecour-Grandmaison was in command of *Escadrille C.46*, also a bombing group.

Naturally, very few long-distance formation raids were made, but many spectacular solo raids achieved a high measure of success. For example, a Farman pilot, Captain Happé, set off on January 20th to attack a German observation balloon near Nieder-Markschwiller, and managed to score a direct hit with his three bombs. The resultant explosion loosened every strut and wire on the old Farman, but Happé managed to coax it home before it collapsed, hero of the first successful attack on a German "sausage."

Two days later, German 'planes raided Dunkirk, and a bombing pilot, Corporal Almonaiced, took-off in a Caudron G.2 and destroyed one raider. On February 11th, Heurteaux was mentioned in the orders of the day for an exceptionally daring solo raid in the course of which he destroyed Lutterbach railway station and ruined a great deal of German rolling stock. On March 23rd two Voisins made an attack on the Zeppelin sheds at Trescary, but achieved little, being forced away by ground fire. The following month saw the bombardment groups really get into their stride.

The first day saw five machines raid the enemy flying field at Handzaeme, a feat which they followed up the next day by turning Vignoules railway terminus into a shambles. During the course of the latter raid, every machine was riddled with bullets, but, although two had their engines shot to pieces, all managed to land safely.

The Naval Air Service broke into the news for the first time on the 12th, when seven seaplanes of the Dardanelles force bombed a large Turkish camp at Gaza and inflicted nearly 200 casualties. Three days later another seaplane made history, for Sergeant de Grandseigne spotted a German cruiser near Ostend and bombed it. An officer and nine men were killed, and this incident is specially worthy of mention because it is the first recorded attack of an aeroplane against an enemy ship. It is thought that the cruiser had been driven out to sea on the previous day when fifteen machines had bombed its base. That same day an un-named pilot dropped six bombs through the roof of the building that housed the German General Staff at Charleville. Then, just to show Germany that she was not the only nation to possess airships, a French dirigible bombed Strasbourg on the 17th, following this with a raid on Valenciennes on the 30th that left the railway junction in ruins and delayed troop trains for three days.

Things were allowed to slacken off during the next three weeks, only to redouble in intensity on May 25th, when the bombers staged a field day and dropped 203 bombs, a total weight of 3,300 lb. of

* For details of this device see "Guns of the War Days," p. 49 of this issue.—EDITOR'S NOTE.

high-explosive. A large hangar and an Aviatik were destroyed at the German aerodrome near Heruilly, the reserve aircraft park at Grand Priel lost four machines when its largest hangar went up in smoke and flames, and a huge petrol dump at St. Quentin received its share of bombs and blazed for three days.

The following day saw eighteen machines attack the Baden Aniline Dye Works at Ludwigshafen in one of the longest raids to-date. Intelligence agents had reported that the factory was engaged in the manufacture of poison gas, and pilots and observers had volunteered to undertake the extremely hazardous flight of 250 miles. In all, the raid took six hours, and although the actual results were never confirmed, it proved that long-distance bombing by formations was quite practicable.

So it was that bombing formations grew to very formidable proportions, and for a time the French raiders prowled at will. No less than twenty-nine machines attacked the Crown Prince's headquarters at Stenay on June 3rd, dropping 178 bombs and over 11,000 steel *flechettes*. The *flechette* was a small steel arrow, very delicately balanced, and was invented by a French pilot for use against cavalry or marching troops. They were carried in boxes and were tipped overboard whenever an enemy column appeared below. Terrible little weapons, they could pierce a man from head to foot when dropped from a height of anything over two thousand feet.

A Bombing Raid—and a Protest

ON June 15th, five Voisins bombed Karlsruhe, in retaliation for a raid on Paris, and for over an hour the city was shaken by the roar of exploding bombs. Considerable damage was done, some eighty-four persons being killed and injured, and so great was the effect on civilian morale that the town was evacuated for over twelve hours. An interesting sidelight on this raid was the fact that the German Government filed an official protest against the raiding of open towns, and the Kaiser sent the town mayor a letter of condolence. Such a protest was not devoid of humour when one recalls all the raids that had already been staged both by aeroplanes and Zeppelins on Paris and other French towns.

The 1st of July brought the Naval Service into the news again when Sub-Lieutenant Rouillet bombed a submarine. Rouillet was stationed on the Austrian Front and was patrolling the Adriatic when he sighted the Austro-German submarine U.11 moving swiftly on the surface. Diving to within fifty feet of the water, he dropped two bombs which fell a few feet short, whereupon the U.11 made a crash-dive and escaped with a shattered periscope.

On the 30th, a mixed formation of forty-five Voisins and Caudrons set out in a dense fog to bomb the refinery plants at Peche-Bronn, but soon became separated into three groups and gave up all hope of reaching their objective. One group found itself over the aviation storage sheds at Pfalzburg and laid their eggs there, and the second group played havoc with the railway station at Dettweiler. Meanwhile, the main group had carried on despite the fog, and dropped 103 bombs on the refinery. By sheer luck every machine found its way home and not a single casualty was reported.

Early in August, the 7th to be exact, a conference of French and British "Brass Hats" had met in Paris to discuss the noble art of aerial bombing and to exchange ideas. In brief, this was the conclusion arrived at: "The bombing of railway stations should be discontinued, unless used for embarking troops. Tracks can easily be repaired and so are not worth the bombs expended upon them. . . . Moving trains are to be attacked at every opportunity, for a wrecked train can block a line for days, and all known engine sheds and carriage yards are to be bombed incessantly. Finally, aviation parks, armament factories and reserve areas are to remain the foremost targets."

In accordance with these orders, what

was then the largest force of the war took-off from Nancy, and the sixty-two machines plastered the Dillingen armament factory with high explosives. Later in that same day, August 25th, a combined force of sixty French and British machines raided the enemy reserves in Houthulst Forest, set it on fire and went home for more bombs. The whole force made three return trips and four tons of steel death screamed down on the ill-fated forest which, by nightfall, was blazing at many points, hundreds of men being killed by bombs and many more by fire. The week ending August 28th proved to be one of the busiest recorded by the bombers—thirty-one raids having been successfully carried out.

September brought no let-up, and over 100 raids were staged, several trains and goods depôts being destroyed. A typical example of a train attack is that carried out by two Voisins on the 13th. Near Donaushingen, their pilots spotted a troop train bowling merrily along, and at once decided that it was a legitimate target. Their bombs turned three carriages into bloody ruin, and, flying one on either side, not fifteen feet from the ground, their observers riddled the entire train with Hotchkiss bullets, killing the stoker and many soldiers. Then, just to make sure, they bombed the track and did enough damage to close the line for a week.

Throughout the year the raids continued, growing daily in size and fury, and pressing ever deeper into enemy territory. But here we must leave them and see how the scouts were faring.

The First Double Victory

WHILE actual fighting in the air was of little consequence during 1915, there were some daring spirits who could not resist a shot at enemy machines, and, although their deeds were overshadowed by the magnificent work of the bombers, many outstanding feats were performed.

Eugene Gilbert had opened the scoring by destroying an Aviatik on January 10th, but it was Peguod who claimed chief honours for the early part of the year. On February 5th he destroyed two Aviatiks with seven shots from an army rifle, the first double victory of the war, and that same evening sent an Albatros down with a crippled engine. For this magnificent effort he was granted a commission as Sub-Lieutenant and awarded the *Médaille Militaire*. A few days later his friend, Armand Pinsard, and Adjutant de Chaiffant were forced to land in the German lines with a dud engine, and Peguod avenged their capture by destroying a Taube. While on patrol near St. Ménéhould he met a patrol of five Taubes busily engaged on a bombing sortie. Three shots from his trusty rifle sent one down in flames, and two others were forced down by a Farman group that joined in the fight, their occupants being captured.

On April 16th Garros attacked an Albatros two-seater over Landemarck and shot its wings off for his fifth victory. Late in the afternoon of the 19th, he bombed a goods siding at Courtrai, but on the way home his engine seized and he was forced to land at Inglemunster, well inside the enemy lines. His Morane "Destroyer" carried the Gilbert-Garros deflector plates, enabling a machine-gun to fire forward through the propeller, and from this makeshift gear the Germans were able to develop the interrupter gear that, for a time, was to win them command of the air.

At this period Gilbert was a flying "Joan of Arc" to the French infantry, and his every deed was greeted with wild acclaim. He had shot down an L.V.G. two-seater on June 18th, and was acknowledged to be the leading air fighter of the day. On the 27th of the same month he volunteered for what was then the most hazardous mission of the war. At 3.30 a.m. his Morane set off from a field near Belfort on the start of its long journey to Friedrichshafen, where Gilbert was to bomb the great Zeppelin sheds.

Arriving over the target, Gilbert planted three bombs directly through a hangar roof, and a few thousand pounds' worth of war gear blossomed skywards. A terrific gush of displaced air turned

THE HEROIC DEATH OF SERGEANT DE TERLINE

Sole survivor of a French scout flight, Sergeant de Terline avenged his comrades' deaths by deliberately ramming an Albatros two-seater and perishing with his victims.

the Morane completely over, but Gilbert managed to regain control and start on the return journey of 183 miles. For an hour he struggled on, but then the wing-bolts, loosened by concussion, threatened to break adrift at any moment, and he was forced to land in Swiss territory. Internment was not for Gilbert, and six weeks later he escaped and returned to France. He never returned to the Front, however, for ear trouble put him in hospital every month or so, and eventually he was appointed test pilot at Villacoublay, where he was killed when a wing came off a new Morane he was testing. So on May 16th, 1918, passed Gilbert, first of France's air fighters.

Mid-year saw the appearance of the dreaded Fokker Eindekker and, while not so active against the French as it was against the British, it gave the authorities much food for thought in regard to the safety of their precious bombers. No longer could they sally forth without an escort, for they were no match for the speedy Fokkers, and it was decided that a single-seater must be developed to protect them. While this discussion was going on, another famous pilot fought his last fight. Late in the evening of August 30th, Peguod destroyed an L.V.G. for his sixth victory and went up early the following morning to try his luck again. While stalking an Aviatik, a Fokker, piloted by Leutnant Kandulaki, came down behind him, and Alphonse Peguod fell with six bullets through his body. Six days later his destroyer dropped a wreath behind the French lines inscribed with the words : "*To our enemy, Peguod, who died in honour for his country.*"

During July, August and September, no less than sixty-three French 'planes were destroyed, and against this loss, only seven victories were credited. By mid-October the Nieuport *Bebé* Scout made an entry into the war and proved such a success that, as the Allies could produce nothing better, the British, Russian, Belgian and Serbian Air Forces were all forced to purchase Nieuports for their own scout squadrons. As was the Fokker to the German, so was the Nieuport to the French, and although only twenty or so *Bébés* reached the Front before the year closed, the names of the men who flew them began to appear in the victory lists with astonishing frequency. The score for the last three months of the year was low, but it was on the right side of the ledger, some sixteen victories being credited to twelve losses.

Navarre, flying his all-red machine, claimed two victories in December, but the most outstanding feat of all was put up by a pale-faced young lad who during the next twelve months was to become the idol of France—Georges Guynemer. On December 5th he destroyed an Aviatik for his first victory, following this with another on the 8th, and a Fokker on the 14th. These three victories may seem insignificant in the light of later scores, but this was 1915, and such a feat was little short of miraculous, and Guynemer was greeted with wild acclaim. No longer were the bombers taking up all the limelight, for the public had found a new knight to cheer—a knight with a steel-throated charger and a snarling Lewis gun for a lance.

So, as the year closed, the scout pilots girded their loins for a great battle in the coming year, with glory and medals for the winner, and a crushed cockpit and an unknown grave for the loser.

1916

The Bombers Show their Claws

ALTHOUGH the deeds of the scouts were now stealing much of their thunder, the bombers still ranked first in the opinion of the Headquarters Staff, and during 1916 they upheld this high opinion with some very fine work, some of it being quite out of line from the usual kind of duty required of bombing aircraft. Take, for example, the event that set the ball rolling for the bombing year.

On January 10th, three Voisins made an attack on the German balloon line suspended over the edge of Houthulst Forest and had started to lay their eggs

when a trio of Fokkers came down out of the sun and had shot one raider down in flames before they were spotted. A second Voisin, with Corporal Padieu as pilot and Sergeant Fulber as gunner, immediately attacked the victorious Fokker, and Fulber sent it crashing down to join its victim with one swift burst. Ignoring the attentions of the remaining Fokkers, the Frenchmen went on with their job, destroyed the balloon, bombed the winch crew, and turned for home. On the way they were attacked by three more Fokkers and two L.V.G.'s, but in a running fight they drove three of the enemy to cover and landed unscathed.

On January 1st several Caudron groups had handed in their old G.2's and had received the new G.4, and on the 23rd nine of these machines raided Metz. As was usual, enemy aircraft were massed to catch them on the return journey, and a mixed group of seventeen Fokker, Albatros and L.V.G. scouts came down to give them a warm reception. But, despite the fact that they were miles behind the enemy lines, the Caudron crews put up such a stiff fight that only one machine was lost against the confirmed destruction of three of their opponents.

The first day of February saw a bombing squadron, stationed on the Bulgarian Front, enter the despatches by a very fine piece of work. A group of seventeen Farmans raided the Bulgar military camp at Petritch, and within a few moments had dropped over 200 bombs and grenades. In less than half an hour the crowded rest camp was a shambles, 476 soldiers being killed and fifty-eight wounded. Very few raids by the aerial dreadnoughts of 1918 could rival such wholesale destruction in the course of a single flight.

Back on the Western Front, the German High Command had started a series of feint attacks all along the French Front, and bombers, scouts, observation machines, in fact, anything that flew, was sent in an effort to trace the real German objective. Not a 'plane got through. The Imperial Air Force had flung its barrage line over the entire Front, and the French machines were either turned back or went down.

On the 21st the French Generalissimo was no longer in doubt, for a nine-hour barrage heralded the attack on Verdun. At the beginning of the battle the bombers fought their way over the German lines and made the war a misery for the German artillery, rest camps and machine-gun nests. Then the French infantry were strafed by German 'planes, and, as their opposite numbers were to do a month or so later, raised their voices for better protection, and the air offensive had to be called off. Of course, the German bombers soon took advantage of this re-call and swarmed over the French back-areas. This state of affairs went on until mid-June, when the Air Service became "fed up" with being ever on the defensive and, ignoring the protests of the infantry, once more resumed their offensive. That month the bombers took part in more raids than had been made during the entire year of 1915, while one pilot actually flew to Berlin.

The First Raid on Berlin

THE hero of this daring flight was Lieutenant Pierre Marechal who, on June 20th, took-off from the field at Nancy at 9.20 p.m. in a specially-built Nieuport that carried oversized fuel-tanks containing petrol sufficient for a fourteen-hour flight. He reached Berlin and showered the German capital with propaganda leaflets which read: "*We might have bombed the open town of Berlin and killed innocent women and children, but have contented ourselves by throwing this proclamation.*"

Unfortunately, he was forced down in Austria by engine trouble, and here is his own story written from the prison at Salzerbach: "*I was made prisoner on June 21st, at* 8.20 *a.m. at Cholm. Austrian officers were disinclined to believe what I had done, but proof came and they had to admit the truth. It was sparking-plug trouble that made me come down. I landed, changed two plugs and started the engine again, but, unfortunately, two more plugs wanted changing and I was cap-*

tured." All in all, Marechal had covered 816 miles in his long night flight, a marvellous feat of pilotage and navigation.

A few days after Marechal's capture, Adjutants Barou and Emmanuelli made a 230-mile night flight across the Vosges, dropped 350 lb. of bombs on the great German powder factory at Rottweil, and set two magazines on fire. Incidentally, this intrepid pair made another raid on the same factory on September 9th and destroyed one of the powder trains.

Perhaps the most intensive offensive of the month, however, occurred on the night of June 21st–22nd, as will be seen by the official communiqué, which stated : "During the night of the 21st–22nd eighteen bombs were dropped on the town of Trèues, where a great fire was observed. To-night, June 22nd, nine aeroplanes (Caudrons) dropped forty bombs on Karlsruhe, 110 miles from Nancy. Another group of ten machines bombarded Mulheim and fifty bombs were dropped on the military establishment of the town. Pursued by a squadron of Fokker-type enemy aircraft on their return from Mulheim, our machines engaged them, and in the ensuing fight a Fokker was seen to fall in flames. One of our machines was compelled to land with engine trouble. During the night of Wednesday, June 21st, our bombarding aviators dropped bombs on the stations and railways at Apermont, Granpre, Septarges, Romage, and Brieulles, on bivouacs in the Consenuoye Woods and military establishments near Thionville. In all, 14 tons of explosives were dropped during this period." Altogether quite a good night's work.

As autumn drew on, long-distance raids became the order of the day, and many fine flights were recorded. On September 24th, Captain Rène de Beauchamp and Lieutenant Daucourt made a 500-mile flight to Essen and did considerable damage to the munition plants there. The night of October 9th–10th saw Adjutants Baron and Chazard bomb the famous Bosch magneto factory at Stuttgart, and set fire to two storage sheds. On November 16th, Sub-Lieutenant Loste and Sergeant Vitalis inscribed their names on the list of "aces"—no mean feat for the crew of a bomber. Ten Albatros Scouts attacked their old Farman, but they quickly drew off when Vitalis shot one down in flames and Loste shot the wings off another. Both men had scored their five victories from the cockpits of their old Farman, and they were to score more victories before Nemesis overtook them. The very next day saw a Morane from *Escadrille M.S.23*, with de Beauchamp as pilot, bomb the railway station at Munich, destroying the engine turntable and firing the sheds. To escape the enemy 'planes that were waiting for him, he flew across the Alps and landed in Italy after a flight of 438 miles. Returning to the Front on December 16th, he was killed two days later when six Albatros Scouts sent his Morane down in flames.

The bombers' year closed with the promise of new and faster machines for the coming year, and pilots who had seen the new machines, Breguets, Caudrons and giant Letords at Villacoublay, waxed enthusiastic, and the hopes of the bomber crews soared high.

Now let us turn back the pages of history to the scouts.

The Start of the "Aces"

THE year opened quietly for the scouts, with bad weather cutting flying activities to a minimum, and it is now history that Germany took advantage of the bad visibility and massed her armies before Verdun. Of the five enemy machines destroyed during January, three had fallen to the bombers and two to the scouts, both the latter going to the credit of Navarre.

February brought an event of considerable importance for, on the 9th, Colonel Règnier was appointed Director of Military Aeronautics, and it was he who devised the squadron system that is used in the French Air Service to the present day. The division was on similar lines to the German system, thus, C.1 stood for *chasse* or scout types ; B.2,

two-seater day bombers ; B.N.3, *Bombardement de Nuit*, three-seater night bombers ; B.N.2, two-seater night bombers ; A.2, artillery or observation types, and so on. The scouts were divided into *groupes de chasse*, each group consisting of three *escadrilles*, and 600 scout pilots were assigned to the various groups, while each *escadrille* was responsible for the safety of two observation, or bombing, *escadrilles*.

While all these plans were being worked out, the scouts were having a tough time, for of the seventeen enemy machines destroyed, only four had fallen to scout pilots, while thirty-one of their own machines had made the last swift dive to earth. Navarre was again to the fore, having destroyed an L.V.G. on the 18th, while Guynemer had won his way to acehood by shooting down an L.V.G. on the 5th.

March saw the score rise to twenty-two, and for the first time new names began to appear in the despatches. Navarre opened the scoring when he caught an Albatros two-seater flying over Diaumont on the 2nd, and shot it down in flames for his sixth victory, while Guynemer registered his eighth at the expense of a Fokker that fell near Thiescourt on the 12th. Three days later he was wounded and had a very narrow escape from death or capture. The following is an account of the incident written by the war correspondent of *Le Matin*, two days later.

" Our airman Lt. Guynemer, who has won a great reputation as a destroyer of German aircraft, has just been wounded in the Verdun region. His wounds are not serious, and after two or three weeks' stay in the Paris hospital where he has been taken, he will be able to return to duty.

" Two days ago Lt. Guynemer started on his daily hunt, piloting a new and smaller machine than usual, a much swifter one. He noticed two German aircraft sailing above him and flew into position behind one of them. When he judged the range suitable, he opened fire and riddled the enemy with bullets. After this first victory, Guynemer swooped on the second German, but misjudging his distance through unfamiliarity with the new machine, he forged ahead of the enemy, who then had the advantage. He opened fire and riddled the Frenchman's engine casing, two bullets passing through Guynemer's left arm. When the machine crashed between the lines, our troops swarmed out of the trenches, and at great risk, carried the wounded airman to safety."

This wound gave Guynemer much food for thought, and never again did he make the mistake of overshooting his opponent. Incidentally, the new machine mentioned was the first of the improved Nieuport Scouts, of which more will be heard later.

With Guynemer in hospital, Navarre made a bid for the leadership in enemy machines destroyed, but, although he bagged an L.V.G. on the 18th, he could not equal Guynemer's record until the following month.

Air fighting was now growing to an hitherto undreamed-of magnitude, and on the 12th, eighteen fights were recorded in the course of which three enemy aircraft were destroyed, while on the 17th no less than thirty-two combats took place, two enemy aircraft being confirmed as destroyed. The month closed with the names of Nungesser, Jesser, Rochefort and Chaput entering the lists as knights of the blue, and it was during this month that saw the real start of the " aces."

The Tragic End of Navarre

DURING April, twenty-seven victories were credited, but the most noteworthy event of the month was the appearance of the Nieuport Scout Type 17, powered with the 110–120-h.p. Le Rhône engine, and armed with a Lewis gun, mounted over the centre-section and fired by a cord leading into the cockpit. A sliding rail mounting was developed later in the year, but the first primitive method of mounting was used quite successfully from April to October, 1916. How great was the success can be seen from the following

monthly record : May, 41 ; June, 18 ; July, 49 ; August, 69 ; September, 87 ; October, 41 ; November, 39 ; and December, 56. Even the Fokker stood no chance against the new French fighter, and many of these erstwhile "scourges of the sky" went down to swell the scores of the French "aces."

With Guynemer still in hospital, Navarre became the uncontested aerial champion of France, and destroyed a Fokker on May 18th for his tenth victory. The next day he caught an L.V.G. over Chattancourt and sent it down in flames, a victory that proved to be his last. What really happened to the colourful Navarre has never been officially reported, and we can only give an account of his end from the various rumours that have been heard since the War. We do know that he was shot down badly wounded on June 16th, but later events are hazy. One rumour has it that he left the hospital, stole a 'plane and was never seen again. Still another, and more persistent rumour, states that his mind became unhinged by his wounds and that when he was discharged from hospital he borrowed a car, suddenly became insane whilst driving it, and charged a crowd of civilians. Perhaps he still languishes in a French asylum, but we prefer to think that he met an end more befitting a brave man, and was lost without trace "somewhere in Germany."

May 19th saw Nungesser and Jesser score their fifth victories, and for a time it seemed that the former would eclipse both Guynemer and Navarre, but Guynemer returned to the Front on June 7th and quickly made up for lost time. Nungesser got a Fokker over Forges Wood on the 16th, and two days later shot down a balloon near La Morville. Attacked by a trio of protecting Fokkers, he offered fight and sent one down in flames, thus equalling Guynemer's score. In the face of such opposition Guynemer took-off at 7 p.m. and destroyed a Fokker over Linons. This ding-dong struggle was maintained throughout the year, and only finished when Nungesser was put out of action by a series of wounds.

In July, Guynemer scored two victories, Nungesser two, Chaput two, and eleven other pilots shot their way to acehood, but not one of them received such acclaim as did a lowly sergeant, who died to score his second victory.

At 4.30 a.m. on July 27th, Sergeant de Terline attacked an Albatros two-seater in the company of two fellow scouts. Both Terline's companions were sent down out of control, and in a blind fury Terline rammed the two-seater, both he and the two Germans, Leutnant Freytag and Corporal Finke, being killed instantly. The French report of the affair stated that Terline had once remarked that, if his gun jammed, he would ram an enemy 'plane. To some, this might seem merely a novel sort of suicide, but the French thought otherwise and awarded Terline a posthumous *Médaille Militaire.*

Honour for "The Storks"

BY September, one scout squadron had won undying fame for its brilliant work, and on the 13th was the first French *escadrille* to be awarded the *Fourragère.* This was *Escadrille N.3, Les Cigognes,* or Storks, commanded by Brocard, and such names as Guynemer, Heurteaux, Dorme, Duellin and Sauvage were entered on its roster. The citation for the *Fourragère* stated that in the period from March 12th to August 18th the squadron had engaged in 338 fights, destroyed 38 German machines, burnt 3 observation balloons, and sent an additional 36 enemy aircraft down out of control. This award spurred the pilots to fresh achievements, and before the year closed, they were to be cited again.

Guynemer secured his fifteenth, sixteenth, seventeenth and eighteenth victories during the month, while Nungesser, fast winning fame in *Escadrille N.65,* scored three victories on the 26th to make his score seventeen. About mid-day he shot down a balloon near Le Transloy, and also bagged a Fokker on the way home. Going up again in the evening he attacked two L.V.G.'s, sent one down in flames, and had to

make a forced landing right in the front lines, when the other put a burst through his petrol tank and shot the drum off his machine-gun.

A Freak Fighter

TOWARDS the middle of October, the new German fighters, the Albatros D.I and the Halberstadt Scout, appeared in ever increasing numbers, and despite their forty-one victories, the French *chasse* pilots were having a very lean time, over sixty machines being listed under the ominous heading of "missing" during the month.

In an attempt to counter the ravages of the new German machines, the French designers turned out one of the freakiest ships of the war, a Spad two-seater, in which the gunner-observer was separated from his pilot by the propeller itself. The nose of the machine was detachable and two steel wires, attached to staples in the top wing, held it in place. The machine was fairly successful in its trials, but when one was sent to the Front for a demonstration, the wires broke, tossed the unfortunate gunner out, and went on to smash up the propeller and pull the whole contraption to pieces.

Late in October, the Spad concern produced a machine that was as good as the two-seater had been bad. Powered with a 150-h.p. Hispano-Suiza engine, this Spad was the answer to a scout pilot's prayer, and once again the R.F.C. were forced to turn to the French for a machine that could fight the new German models on equal terms. But, in case it should be thought that Britain was lagging behind in machine design, it is only fair to state that as the French factories had not yet been able to produce a really good two-seater, the *Aviation Militaire*, in turn, was forced to purchase from us 4,500 Sopwith 1½ Strutters. This machine, fitted with the Kauper synchronisation gear, was then the fastest Allied 'plane at the Front and still in service as late as October, 1917.

Guynemer received the first single-seater Spad to leave the factory, and his success was phenomenal, for between November 9th and 27th he destroyed 2 L.V.G.'s, 3 Albatros Scouts, 2 Albatros two-seaters, and 1 Fokker.

Group 13, which included the "Storks," and *Escadrilles* 83, 68 and 103, were at once assigned the first full delivery of the new machines, and it was the Spad which won for the "Storks" their second citation. This was published on December 5th, and stated that the squadron, now *Spad* 3, had, between August 19th and November 29th, accounted for another 36 enemy aircraft, claimed 89 "out of control," and taken part in 383 aerial combats.

At the end of the year, Guynemer led the "aces" with a score of 25. Nungesser came a close second with 21, while Dorme with 15, Heurteaux with 15, Lenoir with 11, and Tarazcon with 9 were also in the running. Tarazcon's score is worth noting, for he had lost his leg in a crash before the war, and flew with a specially rigged rudder-bar. On the occasion of his fifth victory, on September 17th, he flew low to have a look at the crashed L.V.G., and a shell passed through his cockpit and smashed his wooden leg, whereupon he flew over a German aerodrome, dropped the broken leg and with it a note which read, in effect: "Now pull the other one."

Having proved that they could hold their own against the Albatros, and inspired by the news that the new year would bring them unlimited numbers of new Spads, the scout pilots of France were well content with their lot and had no fear of what 1917 would bring.

Alas! for all chickens that are counted before their hatching—the Falcons of France were due for a rude awakening.

(*To be concluded.*)

NEXT MONTH: Part Two of "Falcons of France" tells the Epic Story of the French Air Service from 1917 until the End of the War, a Period when the Struggle for Aerial Supremacy grew ever Mightier and More Desperate, and the Greatest Sky Warriors of France, rising meteorlike to Fame, fell on Flaming Wings to Heroes' Deaths.

WINGS OF THE FALCONS

A List of the Principal Types of Military Aircraft used by the French Air Service from 1914 to 1916

TYPE	ENGINE & H.P.	SPAN	LENGTH	SPEED (m.p.h.)	PURPOSE
		—1914—			
Astra C.M.	Renault 70	40′ 6″	36′ 0″	56	General
Bleriot 11	Mono-Gnome 80	28′ 3½″	25′ 4″	75	General
Bleriot 39	Le Rhône 60	33′ 9″	27′ 6″	68	General
Bleriot 43	Mono-Gnome 80	33′ 6″	21′ 3″	78	General
Caudron G.2	Mono-Gnome 80	33′ 6″	19′ 11″	76	General
Farman Longhorn	Renault 70	58′ 8″	32′ 0″	85	General
Farman Shorthorn	Renault 70	57′ 11″	32′ 2″	95	General
Morane-Saulnier	Le Rhône 60	30′ 3″	20′ 9″	78	General
Morane-Saulnier	Mono-Gnome 80	33′ 11″	20′ 9″	87	General
Nieuport Mono	Mono-Gnome 80	27′ 8¼″	25′ 1″	85	General
R.E.P.	Le Rhône 60	30′ 0″	21′ 2″	70	General
Voisin	Canton-Unne 140	57′ 6″	32′ 0″	68	General
		—1915—			
Breguet 5	Le Rhône 110	56′ 5″	28′ 11″	75	Bomber
Caudron G.2b	Mono-Gnome 160	33′ 9″	19′ 11″	85	Recon.
Caudron G.3	Anzanzi 100	34′ 11″	22′ 6″	90	Bomber
Farman	Le Rhône 60	58′ 8″	32′ 0″	70	Recon.
Morane 27 Cl.	Le Rhône 110	36′ 9″	23′ 7″	98	Fighter
Morane 29 Cl.	Mono-Gnome 160	36′ 9″	23′ 7″	102	Fighter
Morane Bullet	Le Rhône 110	25′ 9″	18′ 7″	100	Fighter
Morane-Saulnier	Le Rhône 110	38′ 0″	23′ 11″	90	Bomber
Nieuport 12	Mono-Gnome 80	24′ 6″	16′ 2″	90	Fighter
Nieuport 13	Le Rhône 110	25′ 11″	18′ 9″	105	Fighter
		—1916—			
Astra Type D.	Renault 160	39′ 3″	28′ 7″	95	Recon.
Caudron G.4	2 Le Rhône 110	56′ 5″	28′ 3″	95	Bomber
Deperdussin	Mono-Gnome 160	36′ 3″	24′ 0″	105	Fighter
Dorand A.R.	Renault 160	43′ 4″	30′ 6″	98	Recon.
Farman Type N.	Renault 160	57′ 9″	31′ 0″	105	Recon.
Letord	2 Hispano-Suiza 150	57′ 1″	34′ 7″	85	Bomber
Letord	2 Salmson A. 90	57′ 1″	34′ 7″	78	Bomber
Morane Type T.	2 Le Rhône 110	57′ 11″	34′ 6″	85	Bomber
Morane Type S.	2 Renault 250	88′ 0″	39′ 11″	96	Bomber
Morane Type C.	Mono-Gnome 160	23′ 11″	19′ 6″	110	Fighter
Nieuport 15	Le Rhône 110	26′ 9″	21′ 0″	108	Fighter
Nieuport Tripe 2-seater	Mono-Gnome 160	36′ 8″	27′ 7″	95	Recon.
Spad T.P.	Hispano-Suiza 150	39′ 5″	30′ 3″	90	Fighter
Spad S.5	Hispano-Suiza 150	25′ 9″	20′ 1″	110	Fighter
Voisin	Renault 160	54′ 6″	32′ 8″	98	Recon.

"OLD FAITHFUL"

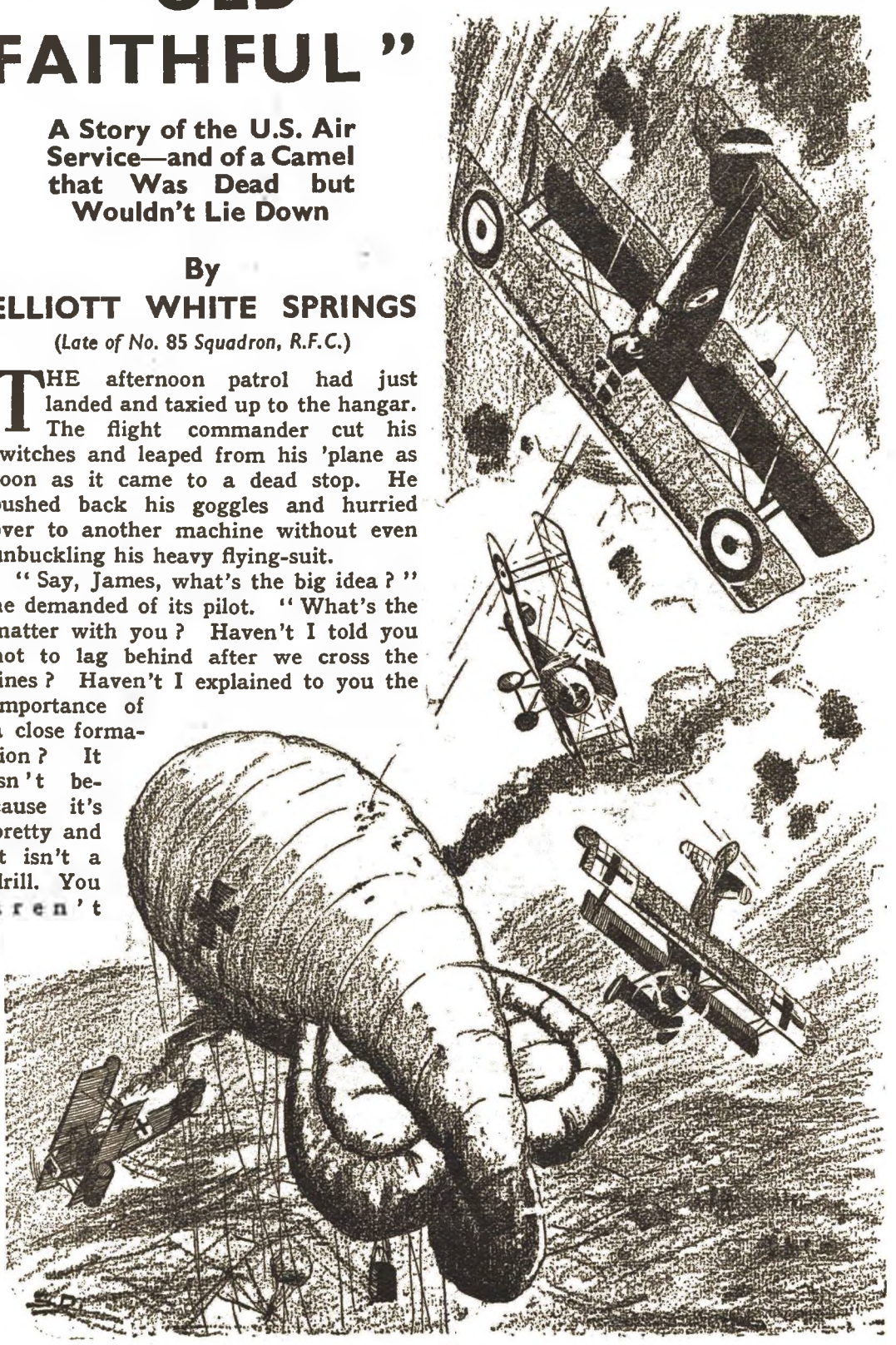
A Story of the U.S. Air Service—and of a Camel that Was Dead but Wouldn't Lie Down

By
ELLIOTT WHITE SPRINGS
(Late of No. 85 Squadron, R.F.C.)

THE afternoon patrol had just landed and taxied up to the hangar. The flight commander cut his switches and leaped from his 'plane as soon as it came to a dead stop. He pushed back his goggles and hurried over to another machine without even unbuckling his heavy flying-suit.

"Say, James, what's the big idea?" he demanded of its pilot. "What's the matter with you? Haven't I told you not to lag behind after we cross the lines? Haven't I explained to you the importance of a close formation? It isn't because it's pretty and it isn't a drill. You aren't

The balloon was getting bigger—it filled his sights. Would he have to ram it, after all?



doing it to please me. It's for your own protection as well as for mine. You were two hundred yards behind to-day and I had to turn back for you twice with six Fokkers sitting over me like buzzards. Then when they came down on us you didn't stay for the fight. What's your alibi ? Think fast."

"It's—er—er—this machine, Henry," James stammered, flushing. "I had my throttle open all the way and still I couldn't keep up with you. There's something wrong with this 'plane. I reported it to the sergeant the day before yesterday, but it's no better."

"I was throttled down to 1,250."

"I was doing 1,350 all the time. And I couldn't get above 12,000 at all. When the Fokkers came down I had to make a quick turn and the 'plane went into a spin. I lost 1,000 feet before I could bring it out. That's the truth."

"Get out and I'll soon see whether it is or not."

Henry got in the other 'plane and the mechanics put blocks under the wheels and started up the engine. The sergeant came over to him.

"You going to take up 9214, sir ? " he asked.

"Yes. Is there anything wrong with it ? "

"Not that I know of. But nobody likes that 'plane. They say it's slow, but the engine will turn up 1,350."

Henry tested the engine for a second and then waved to the mechanics to take the blocks away. He opened the throttle, ran along the ground for two hundred feet and left the ground in a steep left turn. Before he reached 1,000 feet he had looped, spun, rolled and stalled. Then he came across the aerodrome a few feet off the ground to test the speed with the throttle wide open.

He landed and beckoned to the sergeant.

"This 'plane is all cock-eyed, Sergeant," he announced. "No wonder it couldn't keep up to-day. I could only do ninety-five level and the wings flopped like an ornithopter. I thought I was going to lose the centre-section in that last spin. It's rigged all wrong. Get the crew to work on it right away and superintend the job yourself. I'll try it again in the morning. What chance would it have against a Fokker doing 130 ? "

THE next morning Henry took 9214 up again. In five minutes he brought it back and landed.

"How was it, sir ? " the sergeant asked anxiously.

"Terrible," Henry told him. "It's worse, if such is possible. It's as tail-heavy as a lame duck and climbs like a sash weight."

"That's the best we can do, sir," the sergeant told him. "We haven't any more threads on the turn-buckles, and if she's still tail-heavy we'll have to get some new struts."

They walked into the flight office still arguing over the matter.

"Let's see the log-book," Henry suggested.

The clerk handed it to him and he studied it for a few minutes.

"Listen to this," he said : "'*January*, 1918. 63 *Squadron, crashed after sixty hours. Sent to No.* 1 *Aircraft Park and rebuilt. February*, 1918, 40 *Squadron, thirty hours. Crashed, new undercarriage and engine bed, new engine, new rudder and fin. March*, 1918, *repairs to tail surfaces, fuselage re-covered. April*, 1918, *crashed, pilot killed. Sent to* 1 *A.P. Returned to England for salvage. Rebuilt with four new longerons and sent to Training Brigade. May*, 1918, *crashed. New top wing and lower longerons spliced. June*, 1918, *crashed, pilot killed. Rebuilt. August*, 1918, *turned over to U.S. Air Service.*' Well, I should think it was about time. The R.F.C. and R.N.A.S. and R.A.F. certainly got their money's worth out of that 'bus. It's time the French decorated it. Now it's our turn at it. It's so heavy from patching and re-inforcing that it won't fly in any direction but down. No wonder it's tail-heavy. It's tired ! It's an antique now, a regular museum piece. Let's get rid of it."

"Fine, sir," agreed the sergeant. "I was going to suggest that to you. But how ? "

"I'll report it unfit."

He went to the equipment officer's quarters. In ten minutes he was back with a disgusted look.

"Nothing doing. We've tried that before, it seems. The A.P. doesn't exchange stale goods. Now we've got it, we've got to keep it until we lose it in action or bust a longeron in a crash. The A.P. is run by Scots whose ancestors came from Jerusalem. They won't take back any crashes for repair now unless a frame longeron is busted."

"That ought to be easy," the sergeant suggested. "You've got a couple of new pilots that could crash an ice waggon on a prairie."

"All right. See that they always get 9214 and I'll send them out to practise landings in a wind until a longeron goes."

The next day was very windy, with strong gusts coming up the hollow, and Henry sent his new men out to practise landings and hopefully awaited news. None came. 9214 was on the line and ready for the next patrol. Again it lagged behind, leaving an exposed flank, and forced Henry to throttle his own engine to the stalling point to let it keep up. When he landed he was in a fury.

"For God's sake, Sergeant, put a new crew on that 'plane and do something to it!"

"The only thing you can do to improve that 'plane would be to give it a decent burial," the sergeant informed him respectfully. "Let me drop a match in the cockpit."

"No. I don't want to have to court-martial you for carelessness. I'll get rid of it. Send the orderly for Lieutenant James and tell him to practise cross-wind landings for an hour. Fix a tyre valve so it'll leak and then he's bound to nose over. Keep the ambulance cranked up and watch him. He's not very good, anyway."

But 9214 bore a charmed life, and when the next patrol took-off it was trailing a thousand feet below.

THE next day Henry was walking down to the hangars when the commanding officer hailed him.

HE FLEW WITH BISHOP

Captain Elliott White Springs is an American who joined the Royal Flying Corps, went to France with 85 Squadron, under Colonel W. A. Bishop, V.C., and was shot down twice in ten days. On America's entry into the War he was transferred to 148 Squadron, U.S. Air Service.

An "ace" with twelve confirmed victories to his credit, he is also the acknowledged "ace" of air war story-writers, and in this vivid tale he shows that "winning the war" had its problems for the U.S. Air Service no less than for the R.F.C.

"Hey, Henry, I've just had a message from the Colonel," he told him. "There's a balloon over at Marcoing that is directing artillery fire on to our troops and holding up an advance with a counter-barrage. He wants us to get it if we have to shoot it on the ground. He sent over after it this morning twice and they pulled it down each time."

"I know that balloon," Henry informed him. "I had a good look at it last week. They've got it ranged by four 'Archie' batteries and a dozen machine-guns and pom-poms. Besides that, the Fokkers have an emergency landing-field right near there and they take-off as soon as the front lines telephone back we're on our way over. Fat chance we've got to get it! A Camel can't dive fast enough. They'd blow it to pieces before it got within range of the balloon."

"The Colonel knows all that. But he says he's got to have that balloon if he has to go after it himself."

"All right, I won't stop him."

'Never mind that. If he sends over a big patrol they'll pull it down and if he only sends over one 'plane the Fokkers'll get it. He's already sent the S.E.'s after it. Here're his orders. He wants you to take five men and cross the lines ten miles north of Marcoing at 5,000 feet and act as if you were

going after something up there. Nobody will bother you at that altitude."

"Only about eighty Fokkers and ninety-six 'Archie' batteries."

"You'll have to chance that. Anyway, you're to get east of Marcoing and come back over it. Then one man is to drop down and get that balloon if he has to tear it up with his propeller. Fill the guns with Buckingham and send along four phosphorus bombs. The five of you will keep the Fokkers off the man who goes down. Understand?"

"Sure. But what if the Fokkers jump on us instead and we have nothing upstairs to help us?"

"What if you fall down and break your leg, or you cut your mouth on a glass and get blood poisoning?"

"You don't want to go with us, do you? I'll let you get the balloon if you insist."

"No, thanks. It's your lead."

"Who'll I send down?"

"I'll leave that to you."

"Thanks. I'm glad you are going to leave something to me."

"I'd suggest your most worthless navigator. But that would be a hard man to pick. They're all so splendid!"

"Yes, I'll miss them, too. I've got two new men I'm going to shoot down myself so I can get replacements. You don't expect this hero to come back, do you?"

"No. He can just land after he gets it. Not even try to come back. It's useless. The Colonel said that if the balloon was down low by the time he got to it, to make sure of it if you had to take a second crack. If the first man misses, send another. If he misses, go down yourself."

"That's kind of you. But I don't like those blonde German girls."

"You may learn to. I've heard good men are scarce in Hunland. Better get off as soon as possible."

"All right. See you in hell."

There was one bright spot in the programme and he chuckled as he called for the sergeant.

"Sergeant, get out 9214 and load the guns with Buckingham and put on four phosphorus bombs."

Buckingham was phosphorus-filled machine-gun ammunition and was used only against balloons. Of course, if a patrol was out after balloons and a German got in the way they couldn't help it if they set him on fire as well as let daylight into him. And the Germans were so optimistic about Allied balloons that they never went out on patrol without it.

"Better put a piece of that quarter-inch armour plate in the seat too," Henry added. "It might stop an embarrassing bullet. But I guess it would scare the pilot out of two months' pay if it did. Imagine feeling a kick in the pants at 2,000 feet! Anyway, we're going to get rid of this cripple this afternoon so you can begin to put a black border on the log-book."

"What's up, sir?"

"Balloon strafe."

"Where're the S.E.'s? Gone to Paris for the week-end?"

"Suppose so. The idea of this is to fool the Huns. They don't think a Camel will come down after a balloon now. They think we've learned something from experience. We only lost that last forty-two that tried it. Talk about British bulldog tenacity! The Colonel is going to fight it out on these lines if he loses every life we've got."

THE five other pilots of his flight came straggling down to the hangar and Henry got them together.

"The Colonel wants that balloon over by Marcoing and we've got to get it," he told them. "One man has got to be the matador and dispatch the animal. As a reward for this, he isn't expected back for supper. The Colonel says it'll be all right for you to land over there. Here's a chance to spend the rest of the war on Uncle Sam's bounty in perfect safety. We'll protect above and make sure nothing stops you before you get the balloon. Then land. Don't try to come back. There wouldn't be a chance for you. Who'll volunteer for the job?"

There was complete silence.

"Come on, don't all speak at once.

Soft job—make a hero out of you in five minutes—I'll see that it gets to the home papers."

Still there was silence. Henry glanced at his pilots and noticed that their faces were white and their lips drawn.

"Come on," urged Henry. "You should all step forward together. Haven't you ever been to the movies? Haven't you ever studied history? Somebody has to do it, if it's the C.O. himself. You wouldn't embarrass the C.O., would you? Who'd take care of his dog? Well, you'll have to draw straws for it."

He picked up five straws and turned his back to arrange them. Then he turned around and held out his hand.

"One straw has a joint on it. Whoever gets it is going to a beer party."

He held out his hand to James, who was immediately in front of him. He had only done about ten hours over the lines and had yet to fire at an enemy. He reached for the straws, but his hand shook as if he had the palsy and Henry drew back the straws.

"Easy now," he told him. "If you're that bad off, you couldn't get the balloon if you got down to it. Brace up. Say——"

He paused and looked at each man. Then he threw the straws away.

"I've been to the movies," he told them, "and I can't make one of you do what I don't want to do myself. Lord knows I don't want to go down on any balloon—but I'll be the goat——"

"I'm sorry I hesitated. I'll go," James interrupted him. "We can't spare you and I'm not——" The others started to talk now. Each one was willing to go down after the balloon.

"Shut up and get your suits on and study your maps," Henry snapped at them. "I'll dine on schnapps and dachshund to-night."

He turned away and walked over to the ambulance.

"Drive me down to my hut," he told the chauffeur. "I'm in a hurry and I've got to get some things."

At his hut he packed his toilet articles into a musette bag and got his best tunic and Sam Browne belt. He put on breeches and boots and began to look like a soldier. He put in all the cigarettes he had, several cakes of soap, stuffed a big roll of francs into his pocket, and hurried back. He was not nervous; he was simply mad. The idea of throwing away his life on a fool errand like this—making a present of his body to the Germans, lifeless or otherwise! Think of sacrificing a good patrol leader just because the fool had gone to the movies. Ass!

HE stowed away his baggage and gave his pilots final orders. Two of them had tears in their eyes as he gave them final instructions.

They took-off and had climbed 5,000 feet by the time they reached the lines. Henry was in a hurry to get it over with and headed straight into Germany. They were welcomed with a shower of "Archie." He dodged, changed his speed several times, and turned south. There was Marcoing five miles ahead. He could see the balloon as the sun was reflected from its glittering bag. That was his tombstone: "Here lies Henry——." Steady—this was no time for such thoughts. He whistled a few bars of Chopin's "Funeral March" and changed his course for the balloon.

Suddenly the "Archie" ceased. Fokkers! He saw them now, mere specks in the distance climbing up beyond the balloon. The "Archie" gunners didn't want to frighten him away. He worked on south, giving the Fokkers time to climb out of his way. They were pulling the balloon down. He turned towards the lines and made a feint of returning so they would stop. He could see where the artillery was firing—a flash beneath him and then a line of shrapnel bursting beyond the lines. They needed the balloon badly to register the barrage and he guessed they would keep it up high if possible. They counted on the Fokkers to protect it. Here they came. Five Fokkers. Good. Six to five. He welcomed the fight. Then his heart sank as he remembered

he must leave—go on down on that balloon before they pulled it down. He'd better. 9214 couldn't dog-fight with all that extra weight.

The Fokkers were closing up. All right. He'd start down under them, they'd jump on him and the others would come in from above at an advantage.

HE waved, opened his throttle, and dived in a straight line for the balloon, which was now at 1,500 feet. 110 — 115 — 125 — 130 — 140 — 160, his airspeed indicator showed. The wires were screaming so he could not hear his guns as he pressed the trigger to warm them up. But he could see the crank arms moving.

He looked back and saw a Fokker diving down behind him. And behind the Fokker was a Camel. Good. Somebody was on the job.

The balloon was going down slowly, too slowly. He could see it through his sight now. The sky around him was black. He could see tracer bullets and phosphorus pom-poms going by his wing tips. "Archie" had gone mad. The area was well ranged. He'd never get through that barrage.

The balloon was getting bigger—it filled his sight—"Archie" had stopped —too much danger of hitting the balloon now. He saw two observers jump out and one parachute open. Both his guns were going—why didn't something happen? He could see the streaks of phosphorus ahead, he could smell it as he followed in the wake. Why didn't something happen? Surely he was hitting it! Would he have to ram it? All right, here goes.

Suddenly there was a blaze like a flash of lightning and he pulled back on his stick desperately. He was so close he passed through the smoke of the blazing balloon and was thrown out of his seat by the inertia as the 'plane levelled off. He was doing two hundred and was at five hundred feet. In ten seconds he was out of range of the guardians of the balloon who were firing at him frantically. Where were the Fokkers? He looked back and saw nothing. Then he caught sight of a 'plane spinning lazily down from above —burning. He couldn't tell whether it was a Camel or a Fokker. Anyway, the Fokkers were engaged above. He might make it!

He kept his nose down to maintain his speed. 160 — 150 — 140 — 130 — 120 — 110—damn this 9214. It seemed to be dragging an anchor. He had forgotten his bombs—he released them quickly. Three minutes and he would be safe. He'd fool the Colonel and cheat hell. He zig-zagged on down to the tree tops. The three minutes dragged like hours. 105 — 100 — 95 — what a 'plane. He crossed the lines at a hundred feet and throttled his engine. Safe! Thank God for that!

He flew on back to the squadron and landed in front of his hangar. He was the first back. The sergeant rushed out to greet him.

"Glad you're back, sir. What luck?"

"Rotten," said Henry. "I brought this damn kite back."

"You might have been worse off, sir."

The other 'planes were returning now. Henry counted four circling around the field. Where was the fifth? Was that the 'plane he had seen go down?

They landed and Henry met them anxiously.

"James went down in flames. We got one Fokker."

That was the report. Well, they'd got the balloon. What of it? Was it worth the loss of a man? No. To hell with the balloon. There'd be another one there to-morrow.

Henry walked over to the squadron office.

"Congratulations!" the C.O. shouted to him. "The Colonel telephoned over that the balloon is destroyed and one of the observers killed. He's tickled pink over it."

"Yes?"

"Who got it? He wants to send his personal congratulations."

Henry reflected for a moment. Who got it? What did it matter? It cost

James his life. James protected him while he did the shooting. It would be something for his folks. . . .

"James got it," Henry announced. "And just afterwards a Fokker got him. I told you it would cost a man."

"All right. Lucky it didn't cost six. Make out a combat report for James, will you? He'll get a citation out of it and when some Congressman back home finds out about it, he'll get the Royal Democratic Medal for Regular Attendance for Fifty-two Sundays and Good Friday. Good show, Hank!"

The next morning Henry was down at his hangar inspecting his 'planes and cursing 9214. It had come back from the balloon strafe without a single hole in it.

"It's certainly a Jonah," Henry was saying to the sergeant as the crew was wheeling it out of the hangar. "If I had a parachute, I'd take it up and jump out. But I suppose it would land itself and only burst a tyre."

But just then something happened. The mechanics had picked up the tail to swing it around and a puff of wind caught it from behind. Up went the tail, down went the nose; another gust hit it as it stood on its nose and over on its back it went.

Henry and the sergeant watched, fascinated.

"It would be awfully fortunate, Sergeant," Henry remarked slowly, to give his words time to sink in, "if a longeron were broken. Yes, awfully fortunate."

"I think you are right, sir," the sergeant agreed, "and I think I can see from here that the lower left one is smashed."

"I hope so. I'm going up to the mess. Send me a report up there. Don't let anyone see you do it and don't tell me how it happened."

A half hour later an orderly brought Henry the log-book for 9214. Already the entry was posted ready for his signature:

"*Lower left longeron smashed by wind storm. Struck off strength U.S. Air Service and returned to 1 A.P. for salvage by authority wire 13th Wing R.A.F.*"

Henry signed it with a flourish and invited the entire mess to drink a stirrup cup with him to the departing 9214.

THE next morning Henry was sitting in the mess reading *La Vie Parisienne* when an orderly brought word that he was wanted at the hangar at once.

In front of the hangar, packed on a truck, was 9214, covered with dust. And gazing at it was the sergeant, his legs spraddled, his brow furrowed.

"What's it doing here?" asked Henry. "The E.O. sent it to the park at dawn this morning."

"And the park sent it back to us, sir," the sergeant seethed. "Just take a look at this specimen of official correspondence."

Henry took the letter and read:

"*Sopwith Camels are no longer service machines with the B.E.F. in France and all spare machines have been returned to home establishment. Henceforth any squadrons equipped with Camels will make their own repairs. You will therefore proceed to replace the broken longeron. A new longeron may be procured from 2 A.P. stores. By order of the commanding officer 1 A.P. R.A.F.*"

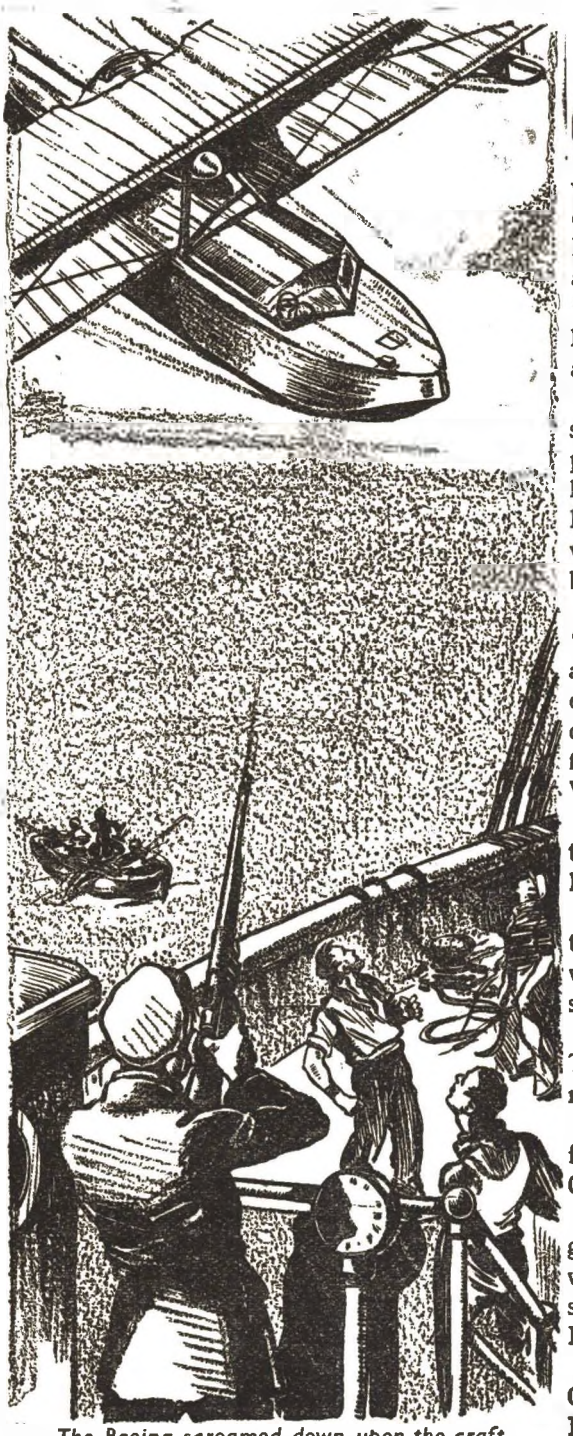
"Why do they pull that on us"? plaintively asked the sergeant. "It'll take ten days and ten nights of hard labour to replace that worm-eaten longeron in that flea-bitten Chinese tomato crate. I hope General Trenchard loses his lunch and may Lieutenant-General Salmond have a bad dream! I think I'll walk out on this war. Sir, I am going over to the estaminet to slake my thirst with some of this Frog snake-bite tonic. Give the guards orders to arrest me for drunkenness when I get back, if I can and if they can."

"An excellent idea, Sergeant, and I think I will go with you," Henry told him. "If a general can get drunk with me, as he has done, without losing caste, I guess I can look upon the cognac with a master signal electrician of the Air Service Enlisted Reserve Corps. You can express my feelings so much better than I can with my meagre vocabulary. I envy you your training as a pipe fitter. Lead on and we will drink a libation to 9214."

EVIDENCE FROM THE SKIES

The Eagle Eye of a Winged Witness Ended a Terrorist's Reign over the Salmon Runs of British Columbia

By EDWARD GREEN



The Boeing screamed down upon the craft, its engine roaring . . .

CHAPTER I

Poachers of the Salmon Runs

GEORGE BALSOM, Chief Inspector of the Fisheries Division on the rugged coast of British Columbia was annoyed. He said so in several colourful languages, not forgetting Eskimo, Siwash and Sanskrit. He said all this to Charles, otherwise known as "Corky" Granville, pilot of the decrepit-looking Boeing flying-boat which bobbed at the fishing-dock at Rocky Inlet.

"Damn it all, Corky," he growled, sucking at his pipe, "that devil, Snively, put it over me again. I know sure as hell he had his gill nets out inside the limit, but when we got there his decks were clear and there wasn't a salmon on board. How did he get rid of them?"

"Ate 'em, most likely," Corky grinned. "Now here am I, a young and budding aviator just trying to get a start. A real eagle eye if ever there was one. Why don't you give me a charter to patrol the fishing areas. I'd catch that lad bending. What do you say?"

Balsom cast a disparaging glance at the young pilot, then at the battered Boeing.

"What do I say?" he mimicked. "Just this. Do you think that wreck of yours would stay in the air long enough to spot a poacher?"

"Poachers aren't found in the air. They're usually on the sea just a few miles from you and your patrol."

Balsom snorted. He jerked a telegram from his pocket and waved it under Corky's delicate nose.

"Read that," he almost yelled, "I'm getting hell from an armchair politician who doesn't know a gill net from a fly swatter, but he wants results. How am I going to get them?"

"Hire me," replied the imperturbable Corky. "For seventy-five dollars an hour I'll clean up all the poachers between here and the Alaskan border."

"Hire you," howled the irate Balsom, "I'll slaughter you if you don't stop pestering me. Why, oh why, didn't you stay in the frozen north?"

Corky grinned. He flipped a cigarette from a package and toyed with a match.

"Because," he replied, "you asked me to come here. I saw a bargain in a flying-boat and I bought it. Here I am."

"And don't I know it."

"You ought to. Now, from five thousand feet I can see all around the ocean and half way to Montreal. Do you realise that some of these inland lakes aren't two miles from the coast, but the waterway into them is about twenty miles. Those poachers have men posted and they see you coming. They have their nets up and their catch dumped before you and the patrol have a chance to get near them."

"What about Snively? He doesn't fish inland. He stays on the open water."

"Yeh, near an island. He has a man posted on the island. He can see the patrol-boat coming twenty miles away. You've got a fine chance of catching him. Now me, I could nab him before he knew what it was all about."

"Nuts," Balsom retorted inelegantly, but he knew Corky was speaking the truth.

"WHAT beats me," Corky went on, disregarding Balsom's retort, "is just why you're so hard on poachers. How can they poach when anyone with a licence is allowed to fish? These fellows all have a licence, haven't they?"

Balsom regarded Corky pityingly.

"I'd forgotten you were a *cheechako*."

"A what?"

"A *cheechako*, a greenhorn, somebody who knows nothing about the new country they're in. In other words, a chump."

"Oh," Corky murmured, his blue eyes opening wide. "Go on."

"Well, the salmon is the king of all fish, and once each year there is a salmon run. It happens this way. You've seen those lakes and rivers running near to the sea along this coast, haven't you?"

"Yes."

"Well, when the salmon are very small they leave those lakes, creeks and rivers. They go to sea—nobody has ever found out where. A king salmon is seldom caught on the high seas. When spawning time draws near, they start for home. They come in their millions, straight for the rivers, lakes and creeks they left four years before."

"The same creeks, I suppose," Corky put in wonderingly.

"Yes, the same creeks. How they know them is past human understanding, but it has been proved beyond argument that they all return to the creek or lake they were spawned in. They hunt along the coast until they find it, and then they come in with a hell of a rush. A regular silver horde."

"Imagine that," Corky ejaculated.

"You don't have to," Balsom smiled, tamping the tobacco in his pipe. "Now, the poachers know just where the salmon runs are heaviest. They know just where they will strike the islands and they know every creek. They use nets of smaller mesh than allowed by law and they stretch them across creek mouths or get into heavy schools close to islands. They make a hell of a killing before the fish ever get a chance to spawn."

"And if they aren't stopped salmon will soon be extinct, eh?"

"Exactly," Balsom replied, and waved a hand shorewards where columns of smoke rose from the chimneys of busy canneries where the rich, red meat of the salmon was being canned for world trade. "All these places would be out of business and a great industry would fail."

"Don't worry," Corky grinned infectiously, rising to his feet. "I, Eagle Eye, will save it, with my little boat."

"Leaky boat, you mean."

"Not in the air," the irrepressible Corky returned. "The water runs out the same holes it came in; automatic bailing, one might say. Do I get the job?"

Balsom looked thoughtful. He had a soft spot in his grizzled heart for this

likeable young pilot whom he had met while on a northern hunting trip. He had casually suggested that there might be a future in flying a fishery patrol. Corky had taken him at his word, sold his northern freight 'plane and picked up a well-worn Boeing powered with a Wasp engine.

The Fisheries Inspector looked steadily at Corky, who had assumed a jaunty pose, cap over one eye.

"Eagle eye, eh?" he laughed. "Well, I'll give you a trial. If you bring Snively in here with plenty of proof I'll see you get a steady charter. I might even help you to buy a decent 'plane."

"Thanks, when shall I order it?"

"When you get Snively, hands down."

"Leave that to Eagle Eye," Corky grinned, flicking a broken matchstick at Balsom. "I'll have him tied up for you in short order."

He was about to walk away when Balsom called him back. The voice of the older man was serious, it carried a warning note.

"Corky, be very careful of Snively. He's got a bad reputation, and his crew are as bad to a man. He'll kill you without compunction if you cross him."

"Not if I see him first," Corky replied confidently.

CORKY sat on the dock and inspected his Boeing with the eye of an expert. His engine was in first-class shape, but the same could not be said for the 'plane itself. The wings were a trifle frayed and the wires were rusted where the paint had worn off.

Corky tapped the wing fabric. The doping was thin, but the fabric itself was intact in places. The hull looked as though it had had the worst of an argument with a buzz saw. Yet, despite all its failings, Corky thought a lot of his machine. It was the first step to a Pacific fleet if things went all right. He had his chance now and he was determined to make the most of it.

As a start he sat down and peered at the towering peaks of the Coast Range of the Rockies, seeking inspiration as to just how he was going to catch Snively. It would never do for him to land beside the fishing boat and accuse the man of poaching. There would be nothing to prevent Snively and his gang of cut-throats from tossing him into the sea and scuttling the Boeing. Corky was fully aware of the huge profits Snively was making by his poaching, and he knew that a man of Snively's type would not stop at murder if those profits were threatened. He shrugged his shoulders. He must find another way.

Suddenly he struck the palm of his hand with his clenched fist.

"I've got it!" he exclaimed. "Balsom's a fathead. He doesn't know anything about aerial photography." He stopped for a moment and pondered. "I don't know a hell of a lot about it, either," he admitted ruefully. "Still, there's nothing like having a try."

He wandered down the dock and stopped before a squat fishing tug with the name "Nosquamish" painted on the bows.

"So that's Snively's tub, eh!" he said to himself. "And I suppose that villainous-looking devil there is Snively."

A thick-set man with a hooked nose and a heavy black beard rolled from the bridge-house and roared at one of the crew. His orders were punctuated by blasphemous oaths.

"A nice lad," Corky muttered to himself. "But he'll look a lot better in a cage."

CHAPTER II

Snively Gets a Shock

THE broad Pacific off Cape Scott on the north-western tip of Vancouver Island was a heaving leaden waste of drab grey. It rolled, slowly, ponderously towards Queen Charlotte Strait, too dignified to bother with mere man. Curling wisps of white capped each roller where it was whipped away in spindrift by the fresh breeze coming from the wide sweeps of ocean. The heaving surface near the mouth of the Strait was dotted with fishing craft, their trolling booms and net rigging plainly visible to Corky, soaring like an

eagle beneath a fleecy blanket of cumulus.

Corky's Wasp was humming smoothly. His 'plane, though disreputable in appearance, was behaving like a lady, which was something to wonder at. His keen eyes scanned the sea for signs of the "Nosquamish." He knew he would find her somewhere near an island, or close to the mouth of a creek on the coastline.

"If I only had a radio I could call Balsom up and ask him what to do with Snively—when I catch him," he added with a wry smile.

DAN SNIVELY'S ill-assorted crew of ruffians were busy setting nets off the mouth of a small river. They were in forbidden limits, but that did not worry the loud-mouthed skipper.

"Too bad old Balsom couldn't see me now," he jeered. "Is Windy up on the look-out ?"

He looked towards a peak far up on a rocky cliff which gave an unchallenged view of the sea for many miles. His beady eyes narrowed as he saw a flag wave from the peak.

"Yep, he's there," he noted. "Get them nets out you lousy rats. Hurry up, get 'em all out."

Heavy nets, with a much smaller mesh than the law permitted, splashed overside into the water. Snively watched the setting of each one, intent on gathering everything that came his way. He was playing a dangerous game—but long-continued success had bred a boastful confidence in himself.

"Balsom'll never get me," he was continually saying. "He's too dumb even to know what it's all about."

The nets cast, he swaggered to the bridge and was leaning on the rail when he heard a strange sound. He looked up, and saw Corky's Boeing drifting in lazy circles far above.

Snively's mean eyes narrowed to slits. His ugly face assumed a demoniacal expression as his coarse lips curled back over his yellowed teeth. His keen brain registered the fact that something was amiss. One never saw an aeroplane so far from civilisation.

"An airyplane !" he exclaimed. "Now what the hell would one of them things be doin' away out here. I wonder if old Balsom's out lookin' for me."

He turned quickly and rushed to the rail. His voice was hard.

"Get them nets in and dump the fish. Hurry, you scum. There's an airyplane comin' here and I don't know what he wants."

The crew of the "Nosquamish" rushed to obey their skipper's orders. Heavy nets were hauled aboard and wriggling forms of silvery salmon were tossed back into the waters of the Strait. Snively, intent on watching the aeroplane, swore roundly.

"Now," he roared when the nets were in and the decks were clear. "If that's old Balsom, just let him prove I was fishing here. He can't prove a thing."

He glanced above, and for the first time noted that the pilot of the flying-boat was leaning over the bow holding an object in his hands. Snively's quick wits gave him the answer.

"By God !" he growled, "a camery, he's got a damned camery to take my picter with. The hell-hound ! If I catch him I'll feed him to the fishes."

The only answer he received to his blood-curdling promise was the raucous, rollicking blast of Corky's Wasp. He stamped away in a boiling rage.

"Get them nets out agin. By God ! if that feller comes back agin I'll do a little pigeon shootin'."

He watched the vanishing Boeing for a moment and then went into his cabin, emerging a moment later with a long-barrelled sporting rifle.

For five minutes Snively stood there, gazing into the distant blue. Suddenly a thought struck him. He emitted a bull-like roar.

"Git them damned nets in agin. We'd better git ashore and grab that guy before he gits them picters developed. Hurry up."

He thrust the rifle against the rail and hurried to the engine-room, where he promised to push the engineer into his own fire-box if he did not get the best

possible speed out of his engine for the home trip. Within five minutes a seething wake swirled behind the "Nosquamish" as she responded to the impetus of a record head of steam.

CHAPTER III

The Eagle's Blind Eye

CORKY was elated. He whistled a gay tune as he prepared to leave the little photographer's shop in Rocky Inlet.

"Now, be sure to get those films developed and printed as soon as possible," he told the proprietor.

"Can't deliver prints in less than two hours; haven't the equipment," the photographer replied.

"Two hours? It'll be dark then."

"Can't help it. If I ain't here I'll leave the prints with my wife. She'll give them to you."

Corky had to content himself with that. By dark, he knew, most of Rocky Inlet would be abed. The fishing boats left before the crack of dawn and parties or other amusements were discouraged until after the catch was in.

It was, therefore, a full half hour after dark before Corky rapped at the darkened door of the photographer's shop. A woman's face appeared as the door opened a trifle.

"Are you Mr. Granville?" she asked.

"I am."

"Here's a package for you," she announced, then hurriedly closed the door, leaving Corky alone.

Pocketing the prints, he set off down the unlighted street, quite unaware that close behind him followed Snively and two of his men, watching every movement he made. His trackers waited until he approached a corner and then rushed forward.

A quick intuition warned Corky. He leaped aside just as a blackjack swished downward, narrowly missing his head. Spinning on his heel, he swung his fist, every ounce of his weight behind that blow. It connected solidly, with a shattering smack, on the jaw of his attacker, and the man went down like a poleaxed steer.

Snively, infuriated by the swift disaster to his man, rushed in, both arms swinging like flails.

That was a fatal mistake for Snively. Corky had been the best middleweight in his squadron. He sized up the rushing skipper quickly, side-stepped lithely, and uncorked a crashing right which flattened Snively's nose and sent him spinning to the side-walk.

Corky never saw the murderous assailant behind him. He felt a sickening blow on his head, a million lights flashed before his eyes and a wave of nausea swept through him as he struggled to keep his feet. Through a dim blur he saw another blow aimed at him. Instinctively he managed to evade it. A snarling curse sounded in his ears.

"Gimme them picters before I kills yer."

At the word "picters," Corky's mind cleared suddenly. New strength seemed to pour into him and his weakness vanished before a flame of rage. His fighting spirit, housed in a magnificent young body, surged up, challenging, compelling. He stepped aside just as Snively leaned on his elbow and shouted.

"Sock 'im agin, Griggs. Knock 'im cold!"

Griggs, eager to avenge his fallen comrade, moved forward swinging his blackjack menacingly. Corky watched him closing in. He flexed his fist, and after feinting with his left, put everything he had into a terrific punch which landed flush on Grigg's coarse mouth.

Corky heard the spat of riven flesh, and saw Griggs stagger back, spitting teeth. The stricken man held his arm across his face, but Corky, moving like a tiger, stepped in and hit him again. Griggs sank to the walk with a moan of anguish.

But Snively was still to be reckoned with, and now he leapt into the fight, flinging out his arms and catching Corky's legs in a powerful grasp. The crafty skipper had realised he was no match for the young pilot in fistic prowess, but knew that his bulk and short, stout arms would be deadly at close quarters.

As Corky crashed to the walk Snively

grasped him in a crushing grip. The young pilot felt his breath being squeezed from his body, but there was still fight left in him. His fist smashed against Snively's face time after time, but the poacher held on grimly and steadily increased his pressure.

Corky realised he was being slowly smothered. He battled furiously for a second and then suddenly went limp. Snively eased his hold for a second, and that was Corky's chance.

He twisted in a quick whip-like motion. His knee leaped upward and struck Snively in the stomach. The skipper gasped, and Corky, swift as a panther, jumped astride and seized his thick black hair in his fingers.

"Try to bushwhack me, would you?" he gritted, smashing Snively's head against the stone walk. "Try to steal my pictures, eh?" he bit off, punctuating the sentence with another hearty bang of Snively's head against the walk.

He heard a groan. Releasing the skipper's hair, he leaped to his feet and looked around. Griggs was moving.

"Time I was on my way," Corky decided, and suiting the action to the words, he ran off into the darkness just as the windows of fishermen's huts were slammed open and irate men demanded to know what the hell the row was about at that time of night. Corky did not stop to explain. He had a pressing engagement at Balsom's office.

CHIEF Inspector Balsom had living quarters in his office and he did not like his sleep to be disturbed. He liked it still less when he saw his visitor was Corky.

"For five cents," he roared, "I'd throw you half way to Russia for waking me up at this ungodly hour. What's the great idea?"

Corky grinned. It was a weird grin. One eye was almost closed and his usually smooth face was covered with dirt and blood. His trim suit was in tatters. Balsom stared at the apparition.

"What the hell hit you?" he gasped, "a railroad engine?"

"No," Corky laughed. "But it felt like one."

The Fisheries Inspector sat and listened as Corky unfolded his story in detail from the time he had taken-off until he arrived at the door of the Fisheries Office. Balsom's eyes glowed.

"And you saved your pictures, eh? Where are they?"

"Here," Corky exulted, and handed the package he had received from the photographer to Balsom.

The rugged face of the Inspector registered many emotions as he viewed the negatives.

"These are good," he remarked, a curious light in his eyes.

Corky felt himself expanding.

"I thought they would be. You can't beat a camera."

"No? Then why didn't you use it?"

"What!" Corky shot out.

"Why didn't you use it, chump?" Balsom roared, tossing the negatives at Corky. "There isn't a damn thing on them," he ended with withering scorn.

Corky examined the negatives. They were complete blanks.

"Well, what do you know about that?" he managed to gasp. "I was sure they'd be all right."

"Where did you have your camera shutter set?" Balsom demanded.

"At the usual, about a twenty-fifth of a second. Where would you have set it, wise guy?"

"At one hundredth, you fool. Don't you know you have to speed up your shutter when your object is moving fast? I don't know much about cameras, but I do know that."

"And the fellow that sold me the camera said it was fool-proof," mused the crestfallen Corky.

"He didn't know your capacity for foolishness," Balsom snapped back, "or he wouldn't have made such a broad statement. Still, cheer up, you've shown me this thing is possible. I never thought about the camera business. Now go out and get some real pictures, and you're on the road to success. For the present get the hell out of here and let me sleep."

"You've never been awake since I've known you," Corky retorted, leaping for the door.

Corky's disappointment over the failure of his photographs was keen, and he spent the next few days with a professional photographer who sent him out on test flights. He fashioned a small mounting for his camera on a bow of the Boeing, and as each defect in his photography was noted he corrected it. In the course of a week he had gathered the fundamentals of aerial photography and was able to take good clear snaps from the air, sharp and convincing.

CHAPTER IV

Down on the Pacific

THE broad bosom of the Pacific heaved gently beneath a grey sky when Corky once more took the air in search of the "Noquamish." He knew the poacher's boat was somewhere around the islands off the mouth of Queen Charlotte Strait, and he had not the slightest doubt about what the ruffianly crew of the "Nosquamish" would be doing. That they would be breaking the law was a foregone conclusion.

His Wasp was turning sweetly in a vibrant song of power as he swung wide of the islands and headed for a lone spot some distance out to sea. It was an ideal place for a lawbreaker. The approach of a ship or a patrol-boat could be noted many miles away. It was a well-known fact that salmon on their homeward trek, came close to this isolated island. They filled its bays and backwashes in their teeming millions, but the law had made it forbidden ground. No fishing craft were permitted to come within three miles of its shores.

Corky's eyes narrowed as he scanned the wastes of sea. Down there, he knew, millions upon millions of salmon were on their way home to spawn. Lying in wait were unprincipled men who would take them for gain without giving them a chance to propagate their own kind.

"The low-down skunks," he gritted as the full meaning of their nefarious game came home to him.

His lean jaw was set as he neared the island and noted a plume of greasy smoke arising from the weather side. Instinctively he knew it was Snively's craft. No other fisherman out of Rocky Inlet would venture near the lone island. It was too close to forbidden waters. He kicked the rudder and brought the Boeing around on a new course that would take him directly over the boat, now hidden by the island.

Corky's nerves tingled with excitement as he swept across the island and saw the squat shape of the "Nosquamish" scarcely fifty yards off shore with all her nets out. Small boats were busy setting other nets. Snively was seeking a rich harvest.

With his camera set for action photos, Corky slapped the throttle wide open and sent the flying-boat hurtling down on the fishing craft. He moved his rudder slightly and brought the "Nosquamish" and her outlaw nets directly within his view-finder. A small portion of the island was also visible, furnishing proof positive that the craft was in forbidden waters.

Wires shrilled as the Boeing screamed down, engine roaring. Fishermen aboard the "Nosquamish" cast startled glances at the sky. They saw the racing Boeing, and were paralysed with fright.

But Snively was made of sterner stuff. He rushed for the wheelhouse, grabbed a rifle and, throwing it to his shoulder, brought it to bear on the blunt snout of the diving 'plane. His gnarled finger squeezed the trigger and the heavy rifle bucked in his hands.

Corky had just drawn back on the controls and brought the Boeing out of the dive when Snively fired. The whistling slug smashed through the veneered bow of the 'plane and flung splinters in his face.

Corky laughed, and sent the Boeing zooming up in a climbing turn. When sufficient height had been gained, he nosed over once again and came hurtling down from a different angle. This time he determined to come as close as possible in order to get a clear photo of Snively. He knew he was taking a long chance, but he had to have a clear photo, and if he got one of Snively standing rifle in

hand on the bridge it would surely be enough to satisfy any court.

The roaring Wasp roared in defiance as it hurled the Boeing down with screaming wires. Corky's hand worked the shutter of his camera, and, as the deck of the "Nosquamish" seemed to rush up to meet him, he saw Snively's rifle jump again and heard the spang of flying lead as it tore through the thin wood of the hull and smacked against a metal fitting in the engine.

Corky waited anxiously for the Wasp to register its ominous warning of damaged parts. He felt sure the bullet had struck a vital spot, but the gallant engine was still howling lustily as it flung the boat up into a fast climb and set a course for home.

CORKY thought he detected a faint smell of hot oil as he banked sharply and laid a course for Rocky Inlet, but his quick glance at the pulsing Wasp showed nothing apparently amiss. He had travelled more than fifty miles before the reek of oil drifted to him again. He looked around keenly.

What he saw caused his heart to skip a beat. The shining enamel on the Wasp's cylinders was turning rust-colour, a sure sign of excessive heat. Corky glanced at his oil gauge. It was falling at an alarming rate.

A hasty survey of the sea showed him to be far from sight of land. He was alone in a blue vault with a grey void beneath and a failing engine behind him.

"Any other time this ocean would be alive with fishing boats," he exclaimed, when a minute search failed to disclose a single craft.

He was about to reach out and close the throttle when a whinnying scream of tortured metal greeted his ears. The Wasp, almost red hot, shuddered, jerked and stopped, its pistons seized solid in oil-less cylinders.

"Damn!" Corky snapped. "Now we're for it!"

The Boeing, robbed of power, was falling into a dispirited glide. Corky fondled the controls with the distress of a boy caressing a hurt puppy. The bottom seemed to have dropped out of his world, and as the late sun sank behind the horizon the hull of his disabled 'plane touched the waters of the Pacific, sent up a few feeble jets of spray, then wallowed in the swell like an injured duck.

Quickly Corky clambered aft and examined his engine. He found an oil line fractured by Snively's bullet. The jacketed slug had not cut the line cleanly, it had just touched it, and the vibration of the 'plane had done the rest. Lack of oil had written the doom of the Wasp. It was completely ruined and Corky knew it.

"If these pictures turn out all right, Balsom'll have a chance to buy me a new coffee grinder," he soliloquised.

Thought of the precious pictures prompted Corky to unload his camera. He rolled the film tightly and wrapped it in oiled paper.

"Can't afford to take a chance on this," he told himself. "I'll pack it somewhere, turn on my lights and send up some flares. There's nothing like keeping cool."

When his work with the film was completed he turned to a tiny locker and withdrew a narrow cylinder. On opening it he found it was empty.

"What do you know about that?" he snorted in disgust. "All the flares gone. Yeh, there's nothing like being prepared either."

But the empty rocket tin gave him an idea. He stuffed the film roll into it and screwed the top down and then threw himself into the seat to ponder his position.

He knew he was in no immediate danger, but the prospect of spending a night at sea was far from attractive. At dawn, fishing boats would pick him up, but he had no wish to wait until then. He checked his position and considered paddling to the coast, but rejected the idea on realising that by the time he had paddled a matter of twenty miles or so it would be well into the middle of next day. There seemed nothing to do but wait for dawn.

CHAPTER V

Rammed!

HOURS passed while Corky floated disconsolately on the heaving wastes of ocean. He knew he was drifting, but fishing craft covered hundreds of miles of sea in these waters and he felt confident of early discovery when dawn broke. He wondered why Snively was out, and then recollected it must have been the poacher's second trip that day.

Just a few hours before dawn a keen wind squealed down from the north. The bobbing 'plane bowed to the rising swell. Showers of spindrift spumed off her blunt bow, and Corky's stomach rebelled in sympathy.

"God help the sailors on a night like this," he commented wryly.

He looked out into the grey darkness to the riding lights on the Boeing's wing-tips. The green and red glows showed dimly.

"Nobody'll see them unless they're right on top of me. If only I had some flares."

For a while he sat and whistled dejectedly, then stopped abruptly as he fancied he heard the thump of a propeller somewhere off in the darkness. He listened intently and soon he caught the sound of wind whining through rigging.

A moment later he saw the red and green lights of a ship off to port and leaped to his feet, yelling loudly:

"Ahoy there! Ahoy! Can you hear me?"

An answering hail came through the darkness. Corky shouted directions to guide the oncoming ship.

He heard the thump of the propeller as the boat came nearer. The splutter of the exhaust was plainly audible, and a moment later lights sprang out on the bridge. Corky took one look, and wanted to dive in the ocean. For the light had revealed the name-plate of the ship. It was the "Nosquamish."

Before he had a chance to express his feelings, Corky was transfixed by the stabbing gleam of a searchlight. He flung himself into the cockpit, jerked a lifebelt around him and stuffed the rocket tin inside his shirt.

His worst forebodings were realised as he heard Snively's bellowing voice.

"Well, if it isn't that damned airyplane guy who took them picters of us, boys. Ram 'im, or else 'e'll 'ave us all in gaol."

He jumped to the engine-room telegraph and signalled for full speed ahead. The ship's lights were extinguished, and Corky found himself staring into a well of velvet blackness, a well that contained death, swift and certain, for him.

The soughing drum of the boat's exhaust beat on Corky's ears. He stood on the bow of the Boeing peering into the dark. Like a coiled spring he poised, tensed for action. For an instant he thought of leaping for the deck of the "Nosquamish" and carrying the war into the enemy's camp, but realising the futility of such a venture he quickly abandoned it and prayed that in the darkness the ship might miss his frail craft.

He never saw the grim bow of the "Nosquamish" until it loomed out of the blackness, a curling white bone in its teeth, scarcely ten feet from him. The bow was aimed directly at the hull of the Boeing. Corky leaped for a wing.

The steel bow of the "Nosquamish" struck with a shivering crash. Plywood and struts collapsed under the impact, and the Wasp fell with a rending smash as its bearings were shattered. The Boeing's hull heeled under, broke apart and drifted with the wash along the vessel's side.

The wings of the 'plane curveted through the air as they tore away from the hull. The starboard pair were smashed to splinters, but the port wings, on which Corky crouched, slithered across the water in the darkness and wallowed in the swell. Through the darkness Corky heard Snively's jeering laugh.

"That settles the rat and his precious picters. Turn on the searchlight and see if anything's afloat."

Corky flung himself to the off side of the wing and dropped into the water. The blinding glare of the searchlight

cut through the darkness and swept across the wing, but Corky was beneath the surface as the light reached him.

"There's a wing floatin' over there, Skipper, but there's nothin' on it."

"Let 'er float," Snively bawled. "When it's found they'll know what 'appened to the 'plane. Old Balsom can't blame us. 'E'll think it was rammed by something else. It'll stop a lot of talk and searchin' ! "

The engine-room bell clanged in the bowels of the "Nosquamish." Foam curled from her stern, and she sped off in the darkness, leaving the drenched and breathless Corky alone on a frail wing buffeted by the winds of the broad Pacific.

LUCKILY for Corky the threatened storm did not break. The ocean rose and fell in long oily swells. The lulling motion caused Corky's eyelids to droop. He sank to the surface of the wing and propped himself against a strut.

Corky had no means of knowing how long he clung to his precarious perch, but he did know he was getting thirsty. He recalled stories of men lost in the desert heat. He pictured their agonies while praying for water. The thought made him still thirstier. He visioned large pools of cool lemonade with himself in the middle of one of them. Try as he might, he could not rid himself of the alluring visions.

Though soaked to the skin and drenched by soft spray, he could not keep his eyes open. He felt his head droop on his chest, and reluctantly he gave up the effort to keep awake.

"Lucky this isn't an all-metal wing," he thought before exhaustion finally claimed him. "It might spring a leak."

Corky's doze was troubled. He dreamed he was walking on a desert. A ferocious-looking Arab, mounted on a five-headed camel, was bearing down on him, shrieking, "Infidel, infidel, out of the way, baboon."

"Allah, Allah," Corky spat back, justifiably annoyed at being called a baboon.

The Arab made a menacing slash with his scimitar and Corky leapt to avoid it. He fell into a pool of water and the shock brought him to sudden consciousness to find himself floundering in the sea, his lifebelt tight beneath his arms. He looked about. The wing was bobbing away, and a small boat, filled with men, was close by. One of the men was shouting :

"Stay where you are. We'll have you out in a minute."

"I wasn't going anywhere," Corky tried to jest. He felt tired, but not too tired to be on the alert.

"Take a good look at that wing, the doping and the colour of the struts," he shouted. "If we can pick up any of the hull so much the better. I want a piece of the hull, it's important."

The skipper of the rescue tug, a fisherman, old and grizzled, leaned over.

"Don't worry, son," he said softly, "we have a piece of the hull. That's what set us looking around for the rest of the 'plane."

"Did you know I'd been rammed ? "

"No, but we had an idea. Floating wreckage usually means a wreck somewhere. And there might be someone hanging on to a piece of wreckage. We always look. It's a custom of the sea."

"A damned good custom, too," Corky endorsed, gulping a noggin of rum handed to him by one of the fishermen.

On learning Corky's identity and mission, the skipper of the fishing tug gave orders to put about and head for Rocky Inlet with all speed. He had heard about Corky before, and was ready to give what aid he could.

"I know a thing or two about Snively myself, lad," he said quietly. "My son's boat was rammed and sunk by that hound, but we couldn't prove it. I've missed Jim, and what help I can give is yours."

The run to Rocky Inlet worked wonders with Corky. Fortified by hot food and dry clothing, he felt like a new man when he walked into Balsom's office. That worthy groaned when he entered.

"You again. I thought I'd got rid of you."

"So did Snively," Corky returned

grimly. "Now, you can open up the gaol and prepare to receive a customer. The charges are breaking every law in the Fisheries Act; felonious assault at night—that was when Snively tried to get those dud pictures off me before—firing at me with a rifle; smashing my oil line; burning up my engine; ramming and sinking my 'plane and leaving me to drown. If there're any others I can think of I'll lay them when he's in the coop."

"That'll be about enough—for the present," Balsom returned tensely. "But can you prove any one of them?"

As Corky related his experiences of the past few hours, Balsom's face assumed an expression which boded ill for Snively. He patted Corky's shoulder.

"Get your pictures developed, son. I'll get a Mounty and pick Snively up."

Corky bristled.

"Mounty, nothing! You'd better get a pan and broom. I've got a little matter to settle with that bird. He can't ram me and get away with it."

"I understand," Balsom said softly. "Come on, son."

THE "Nosquamish" lay at the dock when Balsom and Corky strode aboard. One of the crew stepped in Corky's way.

"You can't come aboard here unless the skipper says so," he snarled truculently.

Corky was in no mood for argument. His lips vanished in a thin white line and his fist whistled through the air to land with a crash on the fisherman's jaw. The man flopped like a fish from a net.

"If you lads play a rough game you can expect the same treatment in return," Corky snapped, his anger rising.

Attracted by the noise on deck, Snively stepped from the bridge-house. He looked down at Corky and Balsom.

"Come down here right away, Snively," Balsom warned. "I want you."

"What for?" Snively demanded, "You ain't got no right on here."

Corky bounded up the steps to the bridge. Snively saw him coming, and reached for the rifle behind the door of the wheel-house.

Before he could raise the weapon, Corky was upon him. The young pilot's rage was cold, implacable. His bunched muscles straightened and sent a hard fist crashing against Snively's mouth. The skipper staggered back, and Corky leaped again.

"Try to drown me, would you?" he snapped, whipping rights and lefts to the poacher's face.

Snively tried to cover up, but Corky's attack was irresistible. He beat the cursing skipper unmercifully, and then, with a well-directed kick, sent him spinning down the ladder.

"You were told to come down, now get down before you make me mad."

Balsom grinned. He had been examining the bows of the "Nosquamish." There was ample proof, driven tight into the seams of the plates, that Snively's boat had indeed rammed the helpless Boeing. Traces of doping and plywood were still clinging to the plates. No marine jury would hesitate to convict on that evidence alone.

"The game's up, Snively," Balsom warned. "You're caught now with enough charges to keep you out of trouble for some time, and when those photos are developed your boat will be confiscated, along with all your gear. Come on."

Balsom was a true prophet. Corky's photos were the deciding factor, and Snively was convicted, his boat and gear confiscated and he himself sent to the penitentiary for a long term.

To-day Corky roves the Pacific coast in a new 'plane, one of a three-machine fleet, all engaged in the Fisheries Patrol. His district is not a healthy one for poachers. They cannot evade the evidence from the skies, and "Old Eagle Eye," as the fishermen now call Corky, can always be relied upon to live up to his name.

GUNS of the WAR DAYS

The Grimly Fascinating Story of the Evolution of Air Fighting and Aerial Weapons during the World War

" By ARMOURER-SERGEANT "

WHEN the Great War first broke upon a startled world aircraft as weapons of offence existed only in the minds of a few far-sighted visionaries. To the General Staffs, whenever they had time to think about them, aeroplanes were regarded almost wholly in the light of " eyes of the Army," and that they should ever seriously fight one another or that a time would come when the whole success of an army's operations in the field would turn upon its supremacy in the air, was too fantastic a dream even for a general's nightmare.

Machine-guns, it is true, had previously been tried out on aircraft, and, as early as 1913, exhaustive official tests had resulted in the adoption of the Lewis as the standard machine-gun of the Royal Flying Corps. But the adoption was one of theory rather than practice, and the pilots of 1914 found their spidery B.E.'s, underpowered Avros and box-like Farmans quite difficult enough to coax off the ground without burdening them still further with heavy armament for which they could foresee no likely use.

So it was that, with but few exceptions, those British aircraft that flew in France in the first month of the War carried nothing more formidable than a revolver or a rifle, and the latter would be quite willingly left behind if the machine was not climbing too well and needed lightening. The exceptions were an occasional machine, usually either a B.E. or a Henri Farman, which, after its arrival in France, had been fitted with an ordinary land-type Lewis gun as a possible means of defence in the event of attack by enemy aircraft whilst carrying out its reconnaissance duties. The idea was an admirable one in theory, but in practice it very quickly showed its defects.

DID YOU KNOW

THAT Roland Garros was not the real pioneer of interrupter gun gears ?

THAT the R.F.C. used a bullet so sensitive that it would explode on striking fabric ?

THAT the German Spandau gun was really a converted Maxim ?

THAT Duck guns were included in the standard armament of the R.F.C. up to July, 1915 ?

Read this article and learn other surprising facts about aerial armaments of the Great War

On August 22nd the first German aeroplane to be seen by the British was sighted over Maubeuge aerodrome, and a Henri Farman, fitted with a Lewis gun in the front cockpit, at once took-off to engage it. The Farman was piloted by Lieutenant L. A. Strange, with Lieutenant Penn Gaskell as observer, but, despite all their efforts, the overweighted Farman could not be persuaded higher than 3,500 feet while the Albatros proceeded serenely on its way at 5,000 feet. As a result of this experience orders were issued to the effect that Lewis guns were to be discarded and that, in future, pilots would rely upon the rifles carried by their observers.

At home, however, the theoreticians were still enamoured of the machine-gun, and in September, 1914, "C" Flight of No. 4 Squadron appeared on the scene with the first aeroplanes to arrive in France definitely armed for fighting purposes. These were Maurice Farman pushers and each had a heavy Lewis gun mounted on the front of the nacelle. Somewhat self-consciously the crews of these early "gun 'buses" set out to win the War in the Air, but on the rare occasions when they met an enemy aircraft, and the still rarer ones when they were able to keep up with it, their overloaded machines proved too slow and cumbersome to force a decision. One by one the heavy guns were discarded and, when 1915 dawned, the revolver and the rifle were still the general armament of the air forces on both sides.

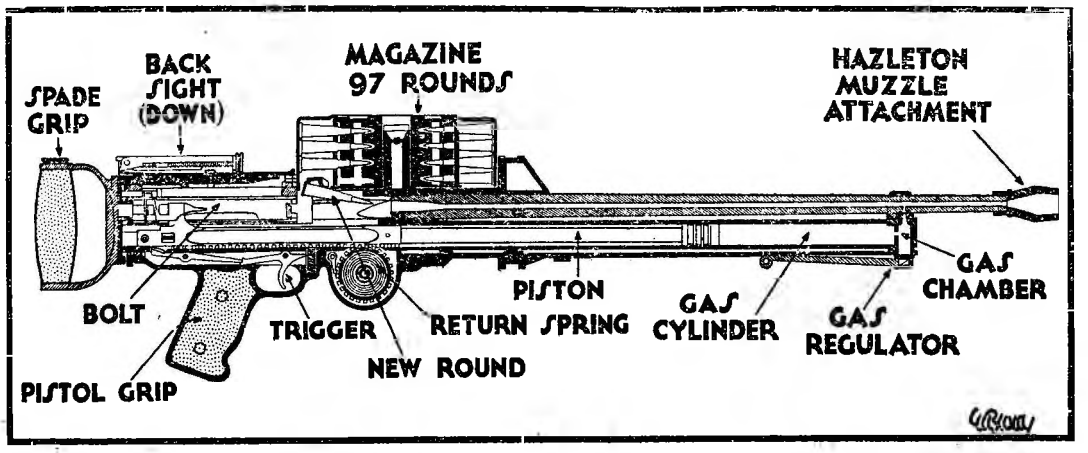
Moreover, results amply justified this preference, for these primitive weapons proved responsible for the shooting down of a surprisingly large number of aircraft during the early days of the War. A typical encounter of these aerial riflemen was one which took place in February, 1915, when a Morane of No. 3 Squadron, piloted by Second Lieutenant V. H. N. Wadham, with Lieutenant A. E. Borton as his observer, fought a duel with an Aviatik biplane near Merville.

The German machine opened fire at long range, the pilot with a pistol and his observer with a rifle. Refusing to waste ammunition until he could "see the whites of their eyes," Borton held his fire until Wadham had manœuvred the Morane to within 100 yards of the Aviatik. He then let fly with his rifle and, as the range rapidly dropped, he could see his bullets splintering the Aviatik's fuselage until suddenly it dived away and forced-landed two miles from its aerodrome at Lille. The Morane, with a bullet through its propeller, another in its fuselage and two more through its wings, managed to regain its own aerodrome in safety.

Sky Traps for the Unwary

SUCH encounters, however, were comparatively few and far between owing to the small number of aircraft on either side at that time, and were so often indecisive that the more ambitious members of the R.F.C. were soon devising new and more effective methods of "downing" an opponent. One ingenious idea, actually tried out against a highly indignant Aviatik by a pilot of No. 6 Squadron, was the attempted entanglement of its propeller by a lump of lead attached to a long wire cable. Unfortunately, the device was no more successful than that of another bright inventor who conceived the brilliant idea of trailing a bomb fitted with hooks. The theory was that the angler-pilot, having hooked the enemy machine, would then explode the bomb electrically by a switch in his cockpit and so blow his opponent—and probably himself—to pieces. Actually, both schemes were imaginative developments of devices then in use, as great, sharp-pronged grapnels, primarily intended for use against Zeppelins, and small, electrically-fired bombs for dropping on enemy 'planes, were to be found in the stores, if not in the aircraft, of all R.F.C. squadrons early in 1915.

Most pilots, however, continued to rely upon the rifle, a form of attack that seemed to have increasing possibilities when an observer of No. 4 Squadron shot the pilot of an Aviatik stone dead with a carbine at a range of 80 yards.



A SECTIONALISED VIEW OF A LEWIS AERIAL MACHINE-GUN : Pressure of the trigger releases the piston, the bolt flies forward and fires the cartridge, and the bullet is forced out of the barrel by the gas of the burnt cordite. As the bullet passes, gas is forced into chamber and drives piston back, winds return spring, extracts used cartridge from breech and, rotating drum, inserts new round. Return spring then drives all parts forward, closes loaded breech and sends striker forward to fire next round. The Hazleton muzzle attachment was a temporary speeding-up device.

Other observers, less confident of their marksmanship, preferred the wider margin of error allowed by the shot-gun, and were so successful in its use that R.F.C. squadrons reaching the field as late as the summer of 1915 included a set of "Guns, duck, 12 bore," as part of their regular armoury stores.

Machine-Gun Warfare

BUT by this time the machine-gun had staged a successful come-back, and the War in the Air had started upon a new and more deadly phase that was to become intensified with each passing month. The re-instatement of the aerial machine-gun was primarily due to the discovery of a means of lightening the Lewis, and a satisfactory method of mounting it so as to give forward fire on tractor-type single-seaters such as the Bristol and Martinsyde Scouts which were then coming into general use. Experiments in the air had shown that, for aeroplane use, the heavy radiator and cooling fins of the land-type Lewis could be dispensed with, thus effecting an appreciable saving in weight as well as a reduction in head resistance. Indeed, it soon became apparent that the real problem was not to keep the gun cool, but rather to prevent the oil in the mechanism congealing in the cold of high altitudes, and for some time this was the cause of many gun stoppages until there was, at last, produced an efficient non-freezing oil.

The Lewis gun, a light automatic gun fed from a circular drum which revolves as the gun is fired, was the invention of Colonel Henry Lewis, an American, and after being turned down by the United States and bought by Belgium, manufacturing rights were purchased by Great Britain, and the gun adopted as the standard light machine-gun of the British Army. In its land-type form, before it was lightened for air use, it weighed 26½ lb. and was 50½ inches in length. A gas-operated gun, it is worked by a combination of a return spring and the pressure of the gas after the explosion of the charge. It had a normal rate of fire of 500–600 rounds per minute and was fed by a drum holding forty-seven rounds of ·303 bullets which could be fired either in short bursts or exhausted in five seconds by keeping the trigger in the "on" position. Later, in July, 1916, a double drum, holding ninety-seven rounds, was introduced for air fighting and generally used throughout the R.F.C. thereafter. Even then, however, it was not to be compared for fire power with the Vickers gun with its 250-round belt,

and the only reason that the Lewis and not the Vickers became the R.F.C.'s first standard machine-gun was the all-important one of its lesser weight.

Having modified the Lewis for air use by reducing its weight from 26½ lb. to 18 lb. and substituting a spade-grip for the heavy stock used on the land type, it now remained to discover the most effective position in which to mount it. The earliest method was to fix it on one side of the fuselage at an angle wide enough to allow the bullets to clear the propeller, but here the snag was that the pilot had to manœuvre in one direction in order to fire in another, a crab-like method of approach that made neither for safe flying nor good marksmanship.

Another form of mounting was one in which the gun was behind the pilot who, when attacked from the rear, was expected to turn round in his cockpit and man the gun, at the same time controlling his machine with his feet reversed on the rudder-bar. A later and more successful method was to fix the gun on a mounting on the top centre-section where it was high enough for the bullets to clear the propeller and yet enabled the pilot to fire straight ahead, aiming his gun by sights on the engine cowling in front of him. The chief disadvantages of this method were the difficulty of changing ammunition drums or remedying stoppages, but these were later overcome by the introduction of a rail-mounting down which the gun could be slid, the pilot gripping the joy-stick with his knees whilst he used both hands to attend to his gun.

On two-seaters, such as the B.E.2c, where the observer, sitting in front, was enclosed in a cage of struts and wires, the problem of an efficient gun-mounting was still greater. A variety of ingenious mountings for various angles of fire were tried, but the most widely adopted was the Socket and Pillar Mounting devised by Warrant Officer F. W. Scarff, who was later responsible for the still more efficient Scarff gun-ring mounting.

In the Socket and Pillar system the underside of the Lewis was fitted with a spike that could be slipped into any one of four different sockets attached to the sides of the observer's cockpit. One of these sockets was fixed just behind the engine, allowing the observer to fire over the top of the propeller ; two more, on either side of the fuselage, gave a small arc on each bow ; and, at the back of the front seat, another at the end of a swinging arm afforded protection from the rear. When attacked or attacking, the observer had hurriedly to make up his mind as to which angle he could best fire from and then manhandle his gun into the appropriate mounting, a process which might have to be repeated several times in the course of a single engagement.

When very hard pressed, a gunner might even risk firing a short burst directly ahead through the revolving propeller. Actually, this was not quite such a suicidal action as might be imagined, for, though the precise odds against smashing the propeller depended upon the engine speed and its relation to the gun's rate of fire, it was generally held that the number of shots likely to hit a blade was in the region of only 4 per cent., and even then there was no certainty that the propeller would break if hit. Cases had been known of enemy bullets piercing propeller blades without splintering the wood, and on the strength of these odds, gunners quite often took chances, firing sometimes as many as twenty or thirty rounds directly ahead, either without any harm being done or, at worst, suffering only a neatly-punctured blade.

The First Pusher Fighter

MEANWHILE, in an effort to avoid the problems of machine-gun installation on tractor-type aircraft, the first effective pusher fighter—the Vickers F.B.5—had made its appearance. The first machine of this type, fitted with a Lewis gun in the observer's front seat, was received in France on February 5th, 1915. Others quickly followed and, apart from an alarming reputation for engine unreliability, the type proved its superiority in many a combat during

its brief reign in France and before it was superseded by the tractor-type of single-seater scout.

But Lewis guns were very scarce in 1915 and for some time the single-seaters were the only type of aircraft for which they could be spared. In the meantime the two-seaters had to carry on their jobs trusting to their rifles and revolvers, or the proximity of friendly scout 'planes, to see them safely through any encounters with enemy aircraft. It was not until July, 1915, that any guns could be spared for two-seaters, and even then they were fitted only to machines carrying out long-distance reconnaissances over enemy territory.

As it happened, the German air service was also going through much the same transitional stage as regards aircraft armament, with the result that encounters between two unequally armed types of aircraft were frequent occurrences. On one of these a Vickers Fighter of No. 5 Squadron, armed with a Lewis gun, six drums of ammunition and a rifle, encountered a German two-seater whose only armament was a Mauser pistol carried by the observer. Attacked from behind at 50 yards range, the German machine had no chance and, despite the efforts of the observer with his pistol, both occupants were killed and the 'plane seen to nose-dive into the ground from a height of 1,500 feet.

The Air-Cooled Parabellum

BUT the German Air Service was also standardising an efficient form of machine-gun. This was the Parabellum, the first air-cooled infantry gun ever invented, which had been introduced into the German Army in 1913. It was not gas-operated like the Lewis, but employed the "short recoil" principle, a purely mechanical system whereby the bolt, locked to the barrel for a certain length of recoil caused by firing, is unlocked and withdrawn about three inches from the barrel after the latter has completed its recoil. The barrel was chambered to take a German service cartridge of ·311 calibre and rifled with four grooves in a right-hand twist. It weighed about 22 lb. and was fed by a 100-round cartridge belt running into the right-hand side of the breech.

When Lewis came up against Parabellum, air fighting really began, and one of the first instances of such an encounter concerned the same Lieutenant L. A. Strange, now a Captain, who earlier had made the unsuccessful attempt to intercept an Albatros with his overweighted Henri Farman. On this latter occasion he was at a height of some 8,000 feet above the Ypres salient in a Martinsyde armed with a machine-gun, when he clashed with a similarly armed German two-seater. Both machines fired for some time without effect, and Strange was just in the act of changing an ammunition drum when his machine got out of control, turned upside down, threw the pilot from his seat in which he had been too loosely strapped, and went into a quick spin. Luckily, Strange had retained hold of the Lewis with one hand and was able to grasp a centre-section strut with the other while he struggled to kick his feet free of the safety-belt with which they were entangled. After spinning 5,000 feet he managed to get his feet loose, and by pressing them against the joy-stick succeeded in extricating the "Tinside" from its spin and righting it sufficiently to enable him to regain the cockpit and return home. His opponent, meanwhile, had also returned home to report seeing his victim thrown out of his machine, and on the strength of his evidence the Germans spent half a day vainly searching a wood for the wreckage of the machine.

But soon the War in the Air was to enter on an even more deadly phase with the advent of the interrupter gear, a device by which the working of a machine-gun was so synchronised with the engine as to allow the bullets to pass between the blades of the revolving propeller. A pilot so armed had an immense advantage, for not only could he take aim at his enemy in the direct line of his flight, thus greatly simplifying his sighting on a target, but his gun, being mounted low down, was readily

accessible for the remedying of stoppages and could be quickly reloaded.

Interrupter Gears are Invented

THE credit for the invention of the first interrupter gear has been variously attributed to Anthony Fokker and to the French pilot, Roland Garros, but, in point of fact, the real pioneer of this epoch-marking device was Lieutenant Eugene Gilbert of the French air service, who actually shot down an Aviatik with the aid of an interrupter device as early as January, 1915—some two months before Roland Garros went into action with a similar device. So totally unexpected was Gilbert's forward-firing attack on the Aviatik that its crew were taken altogether by surprise and their machine was riddled with bullets before they even realised what had happened.

Gilbert's invention, which he first tried out on Luxeil aerodrome in December, 1914, consisted of fitting the propeller blades of his Morane with triangular steel plates and mounting a stripped Hotchkiss machine-gun on the top of the engine cowling immediately behind the propeller. There was no connection between engine and gun, and those bullets which struck the propeller either split in half on striking the apex of a plate or were diverted to left or right. The idea was ingenious and it worked, albeit at the expense of much of the propeller's efficiency and the occasional loss of a propeller blade when a bullet disobligingly refused to be deflected by the plates.

Unfortunately for the Allies, however, just when the full value of this deadly new invention was beginning to be reflected in the mounting list of French victories, engine trouble forced Roland Garros to land inside the German lines whilst flying a Morane fitted with the new device. Faithful to his instructions, Garros at once set fire to his machine, but before it was fully consumed he was captured, the flames quenched and his secret revealed. At once the remnants of his 'plane were rushed to Berlin, and Anthony Fokker was called in to adapt the French invention to German use.

Until Garros's gun was given to him Fokker had never had a machine-gun in his hands and had only the vaguest ideas as to their principles of operation. Yet, after forty-eight hours of ceaseless day and night work, he was able not only to solve the problem, but also to present German air headquarters with the actual interrupter gear which, apart from detail improvements, was thereafter to be standardised throughout the air service for the rest of the War.

The First Fokker Gear

FOKKER'S gear was altogether superior to Gilbert's invention for, utilising the comparatively long intervals between the passage of a propeller's blades across the muzzle of a fixed gun, he connected the trigger of an ordinary belt-fed machine-gun to the propeller shaft in such a manner that a cam-bearing ring on the shaft had only to convey two impulses per revolution to a tappet connected with the trigger mechanism to ensure that a bullet left the gun only at those two instants in each revolution of the propeller when its blades were clear of the muzzle.

The gun which Fokker used for his experiments was the Parabellum, and it was first fitted for active service to a Fokker "Eindekker" monoplane. Oswald Boelcke, Germany's leading ace at the time, was given the first experimental machine and brought down an Allied machine on his third flight. Max Immelmann received the second machine to be fitted with the gear, and when he duplicated Boelcke's success orders were at once given to rush production of the new gears.

It was soon found, however, that whilst the gears could be produced quickly enough there was nothing like enough guns available to meet the demand. The principal trouble was that the number of guns used by the Air Service was so small compared with that used by the Army that no factory would undertake production of a special aeroplane type of gun. Even the appropria-

tion of all Parabellum guns for the exclusive use of the air service did not suffice to meet the demand, and it was finally decided to try and convert the heavy water-cooled Maxim infantry gun, of which there were unlimited quantities available.

By stripping away the water-cooling system and other unnecessary parts there was eventually obtained a gun weighing some 27 lb. 8½ oz., and with a rate of fire of about 380 rounds a minute, which was later speeded up to some 450 r.p.m. The equivalent of the British Vickers gun, the Maxim operated on the same barrel-recoil principle and was fed by a belt holding up to 500 rounds. A special factory was opened at Spandau, near Berlin, for the production of these air-converted Maxims, which thereafter became known as Spandau guns and remained the standard type of pilot's gun of the German Air Service throughout the War.

"Fokker Fodder"

THE first "Eindekkers" fitted with the new gun gear made their appearance in France in the summer of 1915, but it was not until towards the end of that year, when the gun-supply problem had been mastered, that they were encountered in any numbers. Then it was that the Allies began to feel the full force of the new invention, which inspired in the German airmen a new and startling aggressiveness ; an aggressiveness which, supported as it was by a machine far superior both in performance and armament to any then possessed by the Allies, gave Germany virtual dominance in the air from October, 1915, until April, 1916.

For some time after the Germans' first introduction of their new interrupter gear neither the French nor the English could understand why their air losses were mounting with such alarming rapidity. They soon knew, of course, that the enemy had somehow discovered a means of firing through the propeller, but that was all, and Germany, by issuing strict orders that no aircraft fitted with the Fokker gear were ever to cross the lines, succeeded in keeping the mechanism a complete secret for many months.

Nevertheless, the Allies strove desperately to stem the rising tide of Germany's supremacy, but it was not until the Spring of 1916 that the tables were at last turned and the hitherto invincible Fokkers first held and then thoroughly beaten. This sudden change in the Allied fortunes was chiefly due to the introduction of two new British fighters, the F.E.2b, a two-seater with a 120-h.p. engine, and the D.H.2, a single-seater with a 100-h.p. rotary engine and a top speed of about 86 m.p.h. And the fact that these two machines, both of the pusher type and armed only with a single Lewis gun, were able to conquer the far more efficiently-armed Fokker came as reassuring evidence that aircraft performance was still a more powerful factor in air fighting than superiority of armament.

Nevertheless, it was obvious to the Air Ministry that, though the new fighters might hold the Fokker for the moment, the days of the pusher were numbered and that the future lay with the forward-firing tractor type and interrupter gun-gears. Actually, the idea of an interrupter gear had first been put forward in England some time before the War, but so little had been thought of it that it had been allowed to drop and even the name of the originator of the idea had been forgotten. The introduction of the gear by the enemy therefore took us altogether by surprise, and at once every likely inventor was hurriedly commissioned to produce the British equivalent of a German device about which we knew nothing beyond the fact of its undoubted efficiency.

The result was the appearance, early in 1916—some eight months after the first introduction of the gear into the German Air Service—of three different types of British mechanical gears. It has often been stated that even this British achievement was made possible only by copying the gear of a captured German machine, and as evidence that this was not the case it may here be

pointed out that the first aeroplane to reach the R.F.C. fitted with a synchronising gear was a Bristol Scout, which arrived in France on March 25th, 1916, whereas the first German interrupter gear to fall into British hands was fitted to a Fokker monoplane that made a forced landing within the British lines on April 8th, 1916.

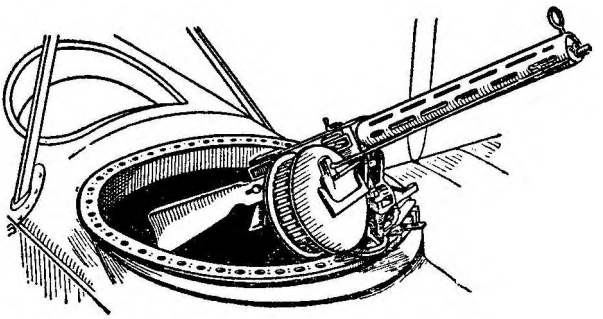
The first three British synchronising gears were the Vickers, the Scarff-Dibovsky and the Arsiad, all of which had in common the general principle that a cam, driven by the engine and working through a series of push rods, pressed the trigger of the gun at intervals so regulated that the revolving propeller blades were clear of the outcoming bullets. Thus the action of these *synchronising* gears was the positive firing of the gun, an entirely different principle from the Fokker *interrupter* gear, the essence of which was to interrupt, or prevent, the gun from firing except at those moments when it was safe for it to do so.

British Gun Gears

THE British gears were originally designed for the adaptation of the Lewis gun, but it was soon discovered that the masses which had to be accelerated in the Lewis were far too heavy and that the gear could be much more easily fitted to the Vickers gun. Moreover, as synchronised fire through the propeller called for a fixed gun mounted on the fuselage, the previous objection to the Vickers on the score of its unwieldiness was now removed, quite apart from the fact that its 250-round cartridge belt meant a greatly increased fire power as compared with the 47-round drum of the 1916 Lewis.

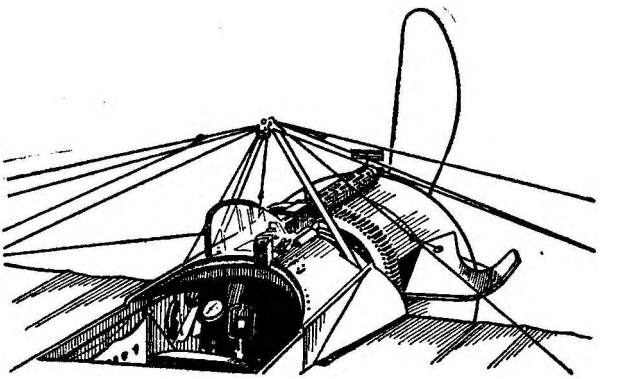
As a point of historical interest, however, it may be mentioned that a French interrupter gear, specially designed for the Lewis gun by Sergeant-Mechanic Alkan of the French Air Service, was tried out experimentally about this time on several R.F.C. aircraft. It gave quite promising results and much more would doubtless have

GUNS OF THE GERMAN AIR SERVICE



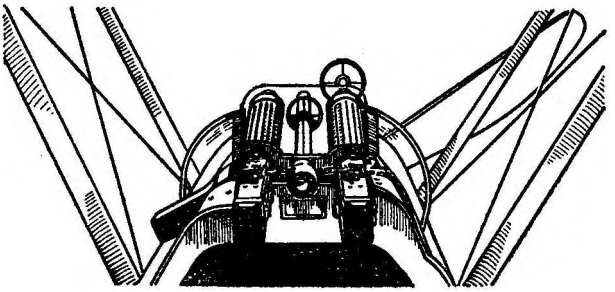
The standard observer's gun of the German Air Service : the air-cooled Parabellum, here shown on a cockpit ring-mounting. It weighed 22 lbs. and was fed by a 100-round coiled cartridge-belt.

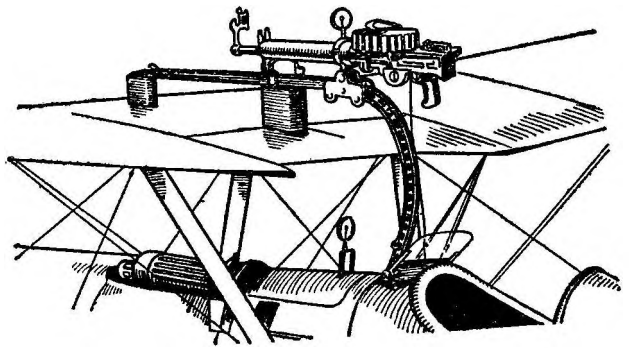
The first "Eindekker" to be fitted with the Fokker interrupter gun gear. The gun used in this experimental model was a Parabellum and the right-hand side of the cowling is open to show the cartridge-belt. The gun was fired by the trigger seen in the centre of the "joy-stick."



STINGS OF BRITAIN'S WARTIME SKY-FIGHTERS

The cockpit of a Sopwith Camel, looking forward, and showing the pilot's view of his twin Vickers guns and Aldis telescopic sight.





A typical two-gun mounting on an S.E.5a. A fixed Vickers lies in a trough on the engine cowling and above is a Lewis which can be hauled down its rail mounting for re-loading or clearing stoppages.

been heard of it had it not been rendered obsolete by the successful conversion of the Vickers.

Of the three early British gears, the Arsiad was designed in the field by Major A. V. Bettington, the officer commanding the Aeroplane Repair Section of No. 1 Aircraft Depôt—the initials of the section giving the gear its name—and after successful trials it was fitted to a number of machines in France. The Scarff-Dibovsky gear was the joint invention of Lieutenant Commander V. V. Dibovsky, of the Imperial Russian Navy and Mr. F. W. Scarff, of the Admiralty Air Department, and was, for some time, the most successful rival to the extensively-used Vickers gear which, invented and produced by Vickers Limited, later became, for a while, the standard synchronising gear of the R.F.C.

The R.F.C. Adopts the Vickers

THE first extensive use of the new British synchronising gears was made during the Somme Battle of 1916 and contributed not a little to the superiority which the R.F.C. established in the course of that homeric struggle. The units concerned were "A" and "B" Flights of No. 70 Squadron, Nos. 19 and 21 Squadrons, all using the Vickers gear, and "C" Flight of No. 70 Squadron and an R.F.C. squadron of Nieuport two-seaters, all employing the Scarff-Dibovsky gear. Soon afterwards this latter gear was superseded by the Sopwith-Kauper gear which, while different in construction, was similar in conception and so much more efficient that it remained in use until late in 1917.

With the successful adaptation of the Vickers gun for air use the R.F.C. now had a new and highly formidable weapon which was quickly adopted as the standard pilot's, or fixed gun, in place of the Lewis which thenceforward became the R.F.C.'s standard free type, or observer's gun. An effective British reply to the German Spandau, the Vickers, in its Mark 1 form, was first introduced into the British Army in 1912 as a replacement of the Maxim then being used. Like the German Parabellum already described, it is of the barrel-recoiling type. On the explosion of the

charge in a cartridge, the recoiling parts are forced backward and returned to their original position by a strong spring. During this movement the empty cartridge case is ejected, the used link of the belt falls clear, a live cartridge is brought into position and another brought into the feed block. The land-type Vickers weighed 28 lb. without its water-cooling system, and had a rate of fire of between 500 and 600 rounds per minute. For air use the water-cooling system was altogether discarded and in its air-cooled form, in which it was known as the Mark 2, it was several pounds lighter and was fitted with a special "speeding-up conversion set" which increased its rate of fire from about 500 r.p.m. to nearly 1,000 and made the functioning of the gun more certain at high altitudes.

At first the bullets were fed into the breech by means of an ordinary canvas belt but, in 1917, an ingenious metal-link belt, in which the cartridges themselves were the pins in the links of the belt, was introduced. As each cartridge was fed into the breech, the link of which it was the pin automatically fell away. These links were, at first, allowed to drop overboard, but when a shortage of metal became acute at home, special scoops were fitted at the side of the gun to catch and hold the disintegrating links in much the same manner as Lewis gun cartridges were retrieved by means of canvas bags clamped to the side of the gun. Also about this time electrical breech-heaters were introduced to prevent the lubricant in the Vickers gun mechanism from becoming so viscous at high altitudes as to impede proper working.

The next important step forward in the development of British aircraft armament was the invention of a new and improved form of hydraulic synchronising gear, so superior to the existing mechanical gear that it quickly replaced the latter as the standard synchronising gear for British service aircraft—a position which it still holds even to this day.

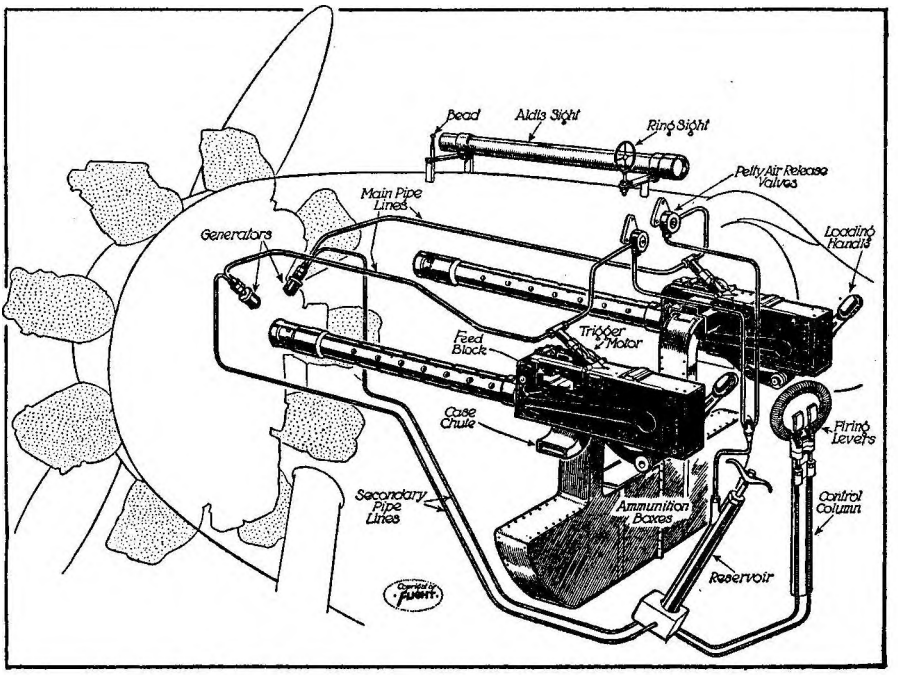
This new gear was devised by Mr. George Constantinesco, a Roumanian inventor of wave transmission by power, and was first successfully demonstrated, fitted on a B.E.2c in August, 1916. Instead of the complicated system of moving parts and awkwardly-shaped rods of the mechanical gears then in use, the "C.C." gear, as it was called, synchronised the firing of the gun by means of impulses transmitted through some 24 yards of copper tubing containing a mixture of oil and paraffin under pressure. Furthermore, it had the great advantage of adaptability to any type of aero engine, and, once its principle and method of installation became properly understood by mechanics, it proved an outstanding and lasting success.

The first squadron to arrive in France with aircraft fitted with the "C.C." gear was No. 55 (D.H.4's), on March 6th, 1917. No. 48 Squadron (Bristol Fighters), similarly fitted, arrived on March 8th, and No. 56 (S.E.5's) on April 8th. In the following month an improved version of the gear, known as the "B" type, was introduced, specially adapted to fit the twin-gun installation on Le Rhône-engined Camels. The "C" type followed soon afterwards, and had the advantage that, except during the actual firing of the gun, the whole of the mechanism was at rest. With this improved model, damage to airscrews became such a rare occurrence—only about one hit for every 25,000 rounds fired — that in October, 1917, all mechanical gears still in use were recalled and replaced by the "C" type of "C.C." gear, thus standardising the one type throughout the British air services. Altogether, some 6,000 of these gears were issued between March and December, 1917, and over 20,000 from January to October, 1918.

The "Richthofen" Spandau Trigger

MEANWHILE, the German Air Service had not been lagging behind in the race for still more efficient armament, and the single Spandau fixed gun had long since been replaced by twin Spandaus mounted side by side on the fuselage in front of the pilot, and both firing through the propeller blades. Other

FIRING THROUGH A REVOLVING AIRSCREW



[Reproduced by courtesy of "Flight."

THE CONSTANTINESCO SYNCHRONISING GUN GEAR: A diagram of a twin Vickers machine-gun installation on a radial-engined fighter, showing the oil pressure system whereby the bullets are automatically timed to pass between the blades of the revolving airscrew. Though the installation shown is a modern one it is basically the same as that used by the R.F.C. during the War.

ingenious improvements that had by then been effected included a long-distance operating lever by which the pilot could reload his Spandau mechanically when it jammed ; and the attachment of counters to indicate the number of shots fired and so prevent a pilot from inadvertently entering a fight with an almost empty gun.

The trigger of the Spandau, too, had been altered in response to a wish expressed by von Richthofen. The original trigger, which actuated the interrupter gear and so fired the gun, was located in the middle of the spade-grip of the joy-stick and was fired by thumb-pressure. Richthofen, however, claimed that it was more natural for a man to use his trigger finger than his thumb, and that firing would be more instinctive in air combat, and therefore more efficient, if the trigger operated like that of a rifle. Richthofen's slightest wish was law in anything that concerned air fighting, and the result of this "brain wave" of his was a complete hold-up of armament production while several thousands of the new triggers and spade-grips were made and fitted to all aircraft then in service.

With the advent of the S.E.5, the R.F.C. had countered the twin-Spandau menace by the installation of two superimposed fixed guns, one a Vickers on the engine cowling with "C.C." gear and the other a Lewis mounted on the top plane and firing forward. At about the same time we also doubled the fire power of the observer by fixing two Lewis guns side by side on a yoke mounting in such a manner that this double Lewis could be fired by pressure on a single trigger. It was not, however, until May, 1917, that the introduction of the "B" type of "C.C." gear enabled us to follow the German example of a year previous and install twin fixed Vickers guns side by side on the engine cowling.

Special Ammunition

COINCIDENT with the development of aerial guns was the development of explosive and incendiary ammunition. Until about the autumn of 1915, ordinary ammunition was the general rule for aircraft use, although even before the War the value of a "tracer" bullet which would leave a record of its path through the air to guide the gunner had been recognised and some preliminary work done on tracer bullets at Woolwich Arsenal. When, however, a supply of these was produced soon after the outbreak of war, they proved so unsatisfactory—owing to insufficient "trace" and variations in size—that they were quickly discarded and, owing to pressure of work at the Arsenal, no further attempts were made to produce special bullets until early in 1916. In that year, experiments with a mixture of one part magnesium to eight parts barium peroxide were found to give good results, and subsequent tests at the Hythe Musketry School resulted in a report to the effect that the new bullet was "easily the best yet tested . . . it gives a clear bright light which can be easily observed."

This bullet, officially known as the S.P.K. Mark 7 T., but more generally as the "Sparklet," was finally approved for issue to the R.F.C. in July, 1916, and thereafter was almost invariably used, in a proportion of one tracer to three ordinary bullets, in every Lewis drum and Vickers belt in the R.F.C.

Three other special bullets, all primarily intended for anti-airship or balloon use, were the Buckingham, Brock and Pomeroy bullets. The Buckingham, the invention of Mr. J. F. Buckingham, the proprietor of a Coventry engineering works, employed phosphorus as the basis of its incendiary composition and was first adopted by the R.N.A.S. in December, 1915, and by the R.F.C. in the following April. In June, 1916, Mr. Buckingham further improved his bullet which, in its Mark 7 form, and later, with a flattened nose, was used for the rest of the War. The flat-nosed bullet resulted from experiments made in France where it had been found that the pointed type made only a small tear in the fabric of a balloon and did not allow enough gas to escape to ensure ignition. The flat-nosed bullet, it was found, punched a circular hole and gave a free escape of gas, but, unfortunately, the flattening of the nose affected the accuracy of the bullet and so weakened it that in many cases it collapsed before leaving the barrel of the gun. Further improvements were made from time to time and were still in progress when the War ended. Nevertheless, the Buckingham was very widely used, not only by the R.F.C., but also by France and the United States, the total of war-time deliveries amounting in all to some 26,000,000 rounds.

Anti-Airship Ammunition

THE Brock bullet was originally invented because of the misapprehension current in 1915 that the exhaust gases from a Zeppelin's engines were led between the outer and inner fabrics of the envelopes to produce a layer of inert gas as a protection against incendiary ammunition. In this belief, Commander F. A. Brock, of the Intelligence Department of the Admiralty, produced his special bullet designed to explode between the first and second fabrics in such a way that the hydrogen would connect with the outside air and so facilitate ignition. Half a million of these Brock bullets were ordered and delivered by December, 1916, and though their use was suspended in the R.F.C. early in 1917 they remained current throughout the War in the R.N.A.S. for anti-Zeppelin work over the North Sea.

The Pomeroy, or P.S.A. bullet as it was called, was yet another form of explosive bullet which was first produced in quantity in May, 1916. It had qualities very similar to those of the Brock and was so sensitive that it would explode even on striking fabric. Even this, however, was not always enough to ensure setting a Zeppelin on fire, and after much experiment the Pomeroy was so perfected that it would pierce the

outer cover of an airship without exploding and then explode on the surface of the inner gas-bag. Its use was confined almost exclusively to home defence units of the R.F.C., whose guns, when on anti-airship patrol duty, were usually loaded with a mixture of the three types of bullets.

The last special bullet introduced into the R.F.C. was the R.T.S., a combined incendiary and explosive bullet of great sensitivity, produced in November, 1917, and so much in demand thereafter that, by June, 1918, a weekly delivery of 200,000 of these bullets was being made. For some time this bullet was used only in England against raiding aircraft, but it proved so effective that in September, 1918, its use overseas was sanctioned, though, in fact, it never was used to any great extent in the field.

In addition to the machine-guns already described, various other types of guns of heavier calibre were employed, either experimentally or as standard equipment, on certain types of British aircraft. Noteworthy among these was the 1-lb. "pom-pom" or "cow gun," used by night-flying F.E.2b's in their attacks on troop concentrations and transports behind the German lines. A slightly heavier type of pom-pom was the Coventry Ordnance 1½-pounder quick-firer, an automatic gun designed to fire a maximum of five rounds at one loading. This formidable weapon had a bore of 37 mm. and a muzzle velocity of 1,950 feet per second, but its great weight of some 200 lb. restricted its use to flying-boats and an occasional and specially-strengthened D.H.4 of the R.N.A.S.

How The Guns Were Used

IN the final analysis, however, the success or failure of the air weapons of the war days depended upon the ability and tactics of the men who used them, and perhaps this brief survey of the guns of the World War in the Air may be fittingly concluded with the following extract from a Memorandum on "Fighting in the Air," issued in March, 1917, by the General Staff for the guidance of all pilots and observers in the R.F.C. :—

"The first essential of successful fighting in the air," stated the Report, "is the highest possible degree of skill in flying the machine, the second is a thorough knowledge of the gun and proficiency in its use. Every pilot and observer who is called upon to use a machine-gun must have such an intimate knowledge of its mechanism as to know instinctively what is wrong with it when a stoppage occurs, and, as far as the type of machine allows, must be able to rectify defects while flying. This demands constant study and practice both on the ground and in the air.

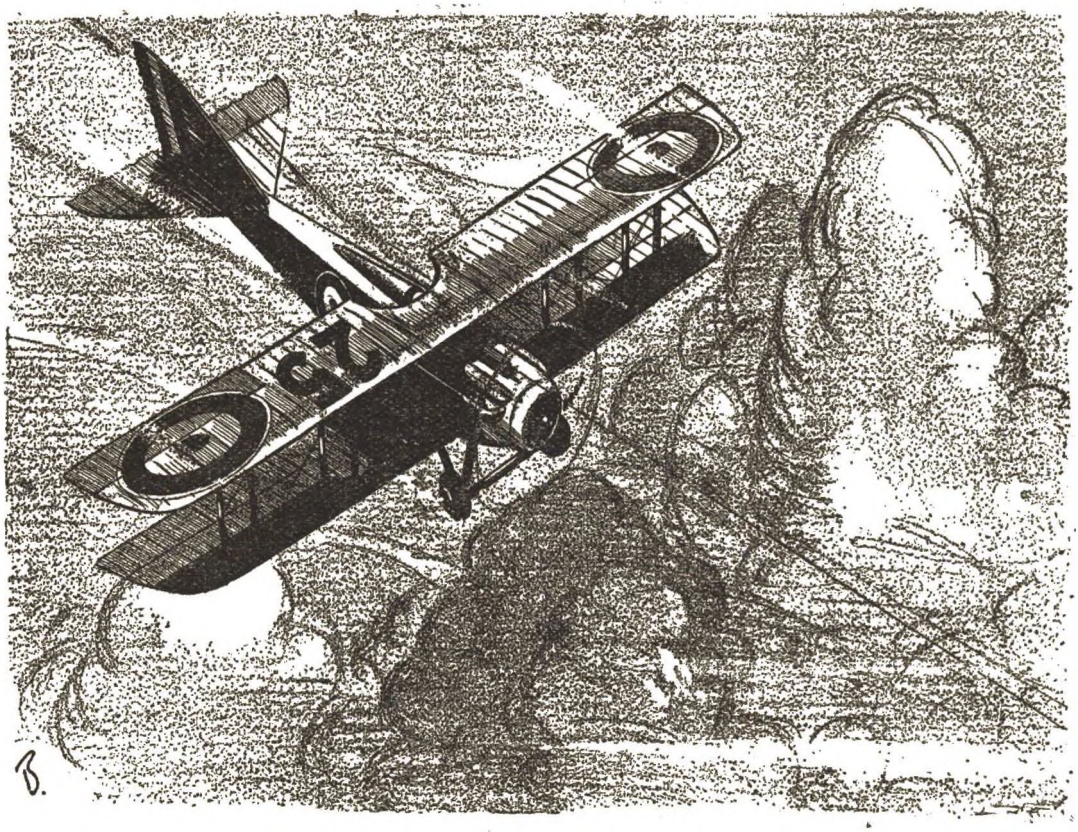
"Except at point-blank range it is essential to use the sights if accurate fire is to be obtained, and constant practice is needed with the sights provided. Tracer ammunition is of considerable assistance, but must be used in conjunction with the sights and not in place of them. Not more than one bullet in three should be tracer, otherwise the trace tends to become obscured. Too much reliance must not be placed on tracer ammunition at anything beyond short range. The principle should be to trust to the tracer at short ranges, but at medium ranges to rely almost entirely upon the sights.

"Opportunities in the air are almost invariably fleeting and consequently the most must be made of them when they occur. Fire should therefore be reserved until a really favourable target is presented, and should then be in rapid bursts. Fire should only be opened at ranges over 300 yards when the object is to prevent hostile machines coming to close quarters, as in the case of an escort to a reconnaissance machine, and should not be opened at ranges over 500 yards under any circumstances. In offensive fighting the longer fire can be reserved and the shorter the range, the greater the probability of decisive result.

"For an observer in a two-seater machine, however, a range of from 200 to 300 yards is suitable, since it enables full advantage to be taken of the sights. Fire may be opened at longer range when meeting a hostile machine than when overhauling it, otherwise there will be no time to get in more than a very few rounds owing to the speed with which the machines are approaching one another. Pilots and observers must accustom themselves to judging the range by the apparent size of the hostile aeroplane and the clearness with which its detail can be seen. This needs constant practice.

"A reserve of ammunition should always be kept for the return journey when fighting far over the lines."

Another article by "Armourer-Sergeant" tracing the development of aircraft weapons from 1918 to the present day, and describing such modern marvels of aerial armament as shell-firing motor-cannons, rotatable gun turrets and the latest types of high-speed machine-guns, will be published in an early issue of AIR STORIES.



A Dramatic Story of the War in the Air, As it Was Fought from the "Other Side of the Lines"

By MAJOR L. S. METFORD

CHAPTER I

The Sole Survivor

LEUTNANT Erich von Breitaugen, of the Imperial German Air Service, flying in the rear of a wedge formation of seven Fokkers, tensed suddenly in his seat.

An onlooker unversed in the ways of the air would have seen nothing to account for his sudden alertness, but the sharp eyes of the young Prussian had caught a succession of faint flickerings, like those of a bird's wings in slow flight, against the tiny wind-screen before him. He twisted in his seat, shading his eyes with his hand, as he looked into the blue above.

An instant later a burst of tracers from his twin Spandaus flashed above the leading 'plane.

Hauptmann Schlieger's head turned swiftly; he caught the warning wave of the young Leutnant's arm and blinked into the eye of the sun.

The formation opened out in response to his frantic signal, swinging out to left and right. Every pilot in the Staffel stiffened. Each realised what had to be done, for above them, dropping like a fleet of dun-coloured hawks, was a squadron of British 'planes.

Normally, the gaily-painted Fokkers would have turned and faced their attackers, for every pilot was a picked and tested fighter, but on this occasion their orders were strict: "See, and return; avoiding combat at all costs."

Erich von Breitaugen, now at the right of the line, cursed the urgency behind the orders, but he would almost as soon have faced a firing squad as disregard

THEY DID THE DIRTY

Lone Survivor of a Fokker Massacre, Leutnant Erich von Breitaugen Courted Death in the Enemy's Territory while the High Command Waited for the News that Would Spell Disaster to the British Arms

the explicit commands of old Von der Stahl ; and the General's instructions had been terse and to the point.

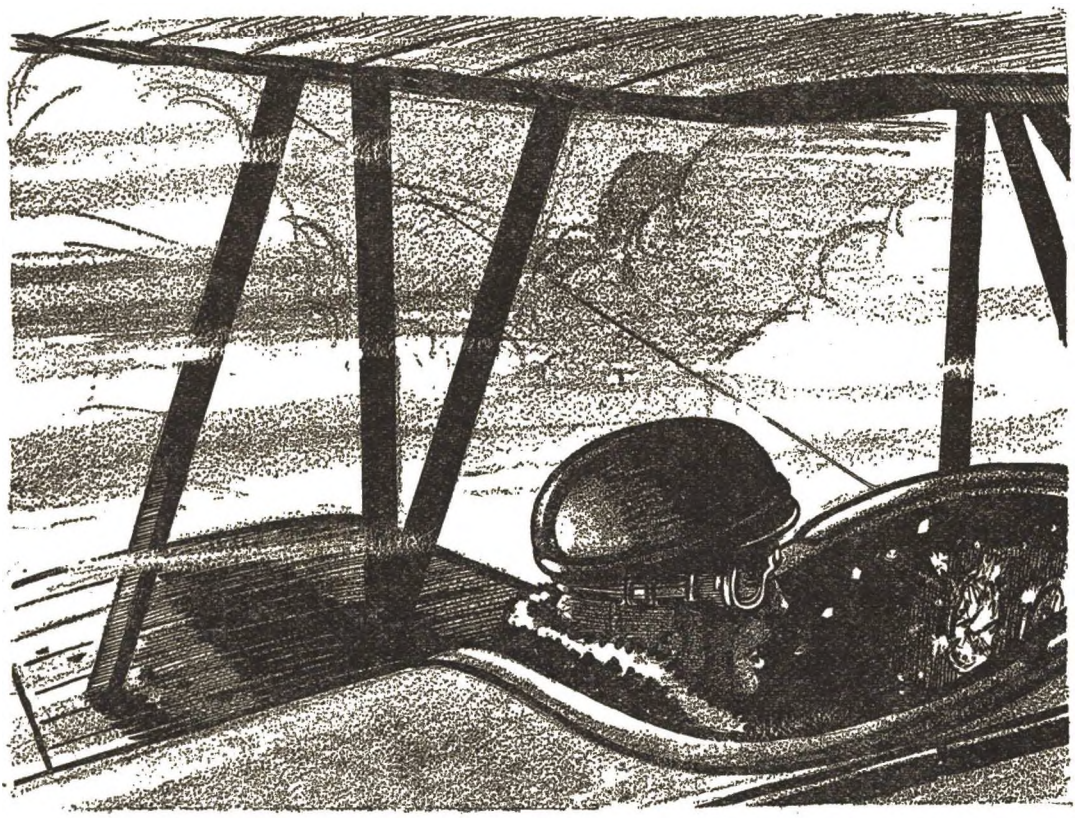
Therefore he opened his throttle wide and sped for home with a regretful glance over his shoulder.

It was not often he had been able to cross so far into enemy territory. The fierce activity of the Allied air services, as well as the prevailing winds, usually kept him and his companions fairly well confined to their own side of the lines, but this time and for the past few days, things had been different.

Certain definite information with regard to the British activities in that sector was required by the High Command—cost what it might—and at last it had been obtained, albeit at a terrible expenditure of valuable lives and aircraft. Now—and this was no small matter—it must be conveyed back to his Excellenz.

"*Ach wohl,*" decided Erich with a philosophic grin, "it might be worse. We've got the information we came for. *Gott im Himmel!* So much ammunition ! So many shells ! Never have I seen so much gathered in one place before. Of a certainty it is for the long-expected attack. Now we know from where it will begin. But what . . ."

Five little grey and smoky pencils suddenly flicked across the nose of his Fokker. Instantly he sideslipped, giving a nervous glance backwards. Then he looked towards Hauptmann Schlieger in



The pursuing Spad opened fire and Erich's instrument-board dissolved before his eyes

the centre of the line. But neither Schlieger nor the line was any longer there. Instead there were three 'planes which dodged and zig-zagged madly in an attempt to keep away from the diving Spads, whilst the others, hotly beset, were fighting furiously nearly a thousand feet below.

Even as he looked, one of the fleeing Fokkers, its longerons pierced through and through by Vickers bullets, broke in two amidships and fluttered earthwards.

"*Donnerwetter!*" groaned Erich. "What am I to do now? If I fight, I disobey orders. If I obey, I am dead."

A line of bullets zipping through his right-hand plane decided matters for him.

"I fight," he growled, "orders or no orders. Better a court-martial than a coffin."

HE dived suddenly, squirmed aside and zoomed upwards, flipping over in a precise Immelmann. He pressed the triggers as a dun-coloured Spad centred in the sights and the twin Spandaus hammered on the forward cowling.

But the Spad pilot was no novice, and he dodged aside even as the stream of bullets flicked through his upper wings. Erich banked tightly round and dived upon a second 'plane which was chasing Schlieger's badly-holed machine in a close circle. One burst—two—and the Hauptmann breathed more freely whilst the British pilot clutched his throat and fought against the choking blood which welled into his mouth from lacerated lungs.

"*Zwei tausend acht hundert und vierzig*" (2840), memorised the young German, carefully noting the number on the falling Spad. "*Mein zehnte.*" (My tenth.) "Now have I one more than Schmidt, who has only nine. I must claim credit for this victory when I return."

But the chances of Erich von Breitaugen's return seemed remote in the extreme, a fact which he realised to the full. They had but seven 'planes—six now that Wolffe's wings had parted from his fuselage—and they were beset by a dozen British Spads, every one of which was obviously handled by a man who knew his job.

"*Gott strafe deisen Englischen,*" Erich swore as he wrenched his Fokker on to a wing-tip whilst a spray of ·303's ripped through his top centre-section. "And some of the young bloods of *der Vaterland* say that as pilots they are not much good! So? They should be up here—those mocking ones. Then they would sing a different song."

The sky was now dotted with a series of independent duels; in each case a Fokker and a Spad were circling madly about the ever-changing centre of an invisible ring; each striving to gain the mastery over the other; each knowing that in all probability the first mistake would be the last. It was quite impossible to tell which of the twain in each ring-a-ring-o'-roses was pursuer and which pursued for more than a few seconds at a time, they were so evenly matched.

Now one, now the other, would gain a momentary advantage and drive in a hurried blast of fire. In one such encounter was Erich von Breitaugen suddenly engaged, but it was of short duration. The British pilot, forgetting the golden rule never to look behind him, glanced for an instant over his shoulder. His Spad wavered a trifle and the nose fell away. Quickly Erich seized his advantage and poured in a withering burst. But even as the British pilot jerked upwards in agony whilst his 'plane nosed down out of control, Erich's instrument board—plain deal, unvarnished, and containing a very minimum of instruments—dissolved before his eyes. Ruddering suddenly, he banked off into a side-slip while the pursuing Spad shot past him with a roar.

Zooming with a full engine, Erich climbed for safety and looked beneath him.

"*Gott im Himmel!*" he groaned aloud; "this is terrible. But three of our 'planes left—two," he corrected hastily as he saw a British machine dive for the tail of the Hauptmann's Fokker

which was already chasing or being chased by another Spad in a tight circle.

"I must get back and report; only Theissen and I are left alive and poor Gustav—he will not last long."

It was a true prophesy, for even as he turned east and fled with full throttle towards the lines, Gustav Theissen fell mortally wounded beneath the converging fire of three of the victorious Spads.

"Twelve to seven," Erich muttered, licking powder grains from parched lips. "They had every advantage; even the accursed wind blows from the east to-day."

He glanced hurriedly behind him and what he saw there made him clench his jaw determinedly. "Six!" he gasped. "Still six of them left. Six to one. I must report. I alone am left. If they get me, all is lost. I must get back. *Himmel!* So much depends on me. *Ach leider!* So much—so much!"

BUT he knew only too well that his chances of returning and reporting the discovery of the vast camouflaged dumps of ammunition and supplies were far from good. Usually he was able to show a clean pair of heels to his pursuers in an emergency, although his D.3 was rated a little slower than the Spads, but he had an exceptionally good engine, and few pilots possessed a more completely equipped bag of sky tricks than Erich von Breitaugen. This time, however, his Oberursal was behaving badly. His pressure gauges having disappeared when his instrument board was shattered, he could not know that the life-giving oil line was damaged—so badly dented that the flow was cut down.

Thus it was that in a very short time tracers began to smoke past him in disconcerting numbers. He tried to climb, but looking above him; he realised the futility of attempting this, as two Spads were there, already dropping to the attack.

And the lines were so near. Almost, he calculated, they were within gliding distance. He pushed the stick forward and dived. If only he could get across the shell-torn inferno which lay beneath him!

"Such information!" he muttered. "Such valuable information! It might even mean the *Pour le Mérite*."

Something burned his left forearm. Instinctively he squirmed away, gazing almost incredulously at the little red stream which oozed almost immediately from the wrist-band of his short leather flying-coat.

"A scratch," he muttered. "It is nothing. I shall get back."

Bam! Crash! His 'plane shuddered from prop-boss to rudder-post as his vibrating engine seized up solid.

"*Ach Himmel! Zehn tausand Teufeln!*" he cursed as he put the nose down. "Now they have me!"

Looking anxiously below him, his trained eye told him that a straight glide would land him fairly between the opposing trench systems, whereas away to the south he saw a stretch of wooded land from which projected here and there rocky outcroppings, sparsely tree-clad.

Carefully he weighed his chances. If he landed in No Man's Land he would almost certainly be killed, if not in the crash, then probably before he could take cover. On the other hand, if he could gain the shelter of the woods, even although they were in enemy territory, he might succeed in lying hidden until darkness fell and then be able to make his way across the lines under cover of night.

"*Gott sei gedanken,*" he breathed as the firing behind him ceased. "These fellows do not shoot one down when one is disabled. They are foolish, of course, but it is certainly well for me."

He set the nose of his machine towards the woods. But this did not seem to suit the leader of the British flight, who had guessed what the Fokker pilot was attempting to do. A Spad dropped down beside him and the pilot, who carried a red streamer on an interplane strut, grinned at Erich and waved him away.

Erich glanced about him with a hunted look and saw he was trapped.

Spads were above, behind him and to the right. Only the left was clear. There being nothing else for it, he shrugged his shoulders resignedly and ruddered over.

Thus, carefully shepherded, he landed a few minutes later, some five miles within the British lines in a long and narrow field.

CHAPTER II

A Prisoner Resists Arrest

AS the Fokker rolled to a standstill, Erich von Breitaugen jumped out, wrenched the fuel pipe free and struck a match.

The raw fluid caught at once, and he jumped back to escape the leaping flames. Then he turned and bowed from the waist to the young English flight commander who was running towards him over the short grass.

"You surrender, of course?" the newcomer asked, covering him with an automatic.

"*Natürlich*," he was about to answer, when it occurred to him it might be better if he pretended not to understand the question. Instead, therefore, he smiled slightly and replied "*Was sagen Sie?*"

"That's all right," grinned the Englishman, holding out his hand. "Fortune of war, old chap. Wounded?" he asked sympathetically, his eyes falling on the dripping sleeve.

Erich followed the direction of the glance and nodded shortly.

Then he looked about him and saw the flight commander was alone. Glancing aloft, attracted by the sound of droning engines, he noticed the other 'planes were already winging their way westwards, evidently under orders from his captor, whose 'plane with its red streamer now lying limp was standing nearby.

Still covering him, the Englishman searched him with his free arm. This was by no means to the liking of Erich. That he—a von Breitaugen—should be subjected to this indignity at the hands of an enemy was unthinkable, usage of war though it undoubtedly was.

Slowly and cautiously, smiling in friendly wise the while, he drew back his right arm, then suddenly stiffening, he shot it forward with all the strength of his powerful shoulders behind the blow, catching the Englishman on the point of the chin.

He staggered back, his eyes taking on a glazed look, and, like those of a comedian at a music-hall, seemingly at cross-purposes with one another. Then he sagged to his knees and collapsed slowly.

Erich took one hasty glance round, saw half-a-dozen British infantrymen advancing at the double and hesitated. There was no time, he could see, to walk to the unconscious Englishman's machine before they overtook him, and to run would be fatal; they would be immediately suspicious. Therefore he strolled to meet them with apparent unconcern, binding up his arm as he went.

He held up his hand as they reached him, and the foremost halted and saluted.

"Want any help, sir?" he asked with a glance past Erich at the man lying on the ground not far from the Fokker, now burning furiously.

"Yes," he answered smilingly, thanking Providence for a far-sighted parent who had sent him to Oxford after Heidelberg, and also for the fact that there was little difference between the leather coats worn by British and German pilots: "I want one of you men to swing my propeller for me. Then go and attend to the German prisoner who is badly wounded. Take him to Headquarters for questioning."

"Wounded, sir?" grinned the Tommy in some surprise. "Why I seed you knock 'im cold."

"The same thing," smiled Erich. "He resisted arrest, so I had to. Which of you men can swing a propeller?" he demanded as the others came up.

"Me, sir," grinned one importantly, with a hurried salute. "Useter work for Grahame-White out 'Endon way before the War, sir."

"Good. Follow me."

He led the way to the Spad, climbed in, and studied the controls with close attention.

"All right," he said quickly, glancing over his shoulder and seeing the others grouped round the English pilot, who

was now trying to sit up. "Pull her over and jump aside. She's still hot, and should start at once. Contact!"

The man heaved on the propeller, and simultaneously Erich von Breitaugen heard a sharp crack from no great distance. *Ping! Ping!* The 'plane was moving now. Furiously he jockeyed with the throttle lever, intent on getting off the ground as soon as possible.

He looked backward. The Englishman was firing at him with his automatic. One of the men was taking aim with his rifle and the man who had started his engine was now standing open-mouthed, gaping foolishly from him to the little group near the burning 'plane.

Suddenly the man flung himself prone, snatched his rifle from the ground where he had laid it, and began rapid fire with his magazine.

But the Spad's tail was up now and it was fast gathering speed. Erich crouched in the cockpit, wondering how soon it would be safe to take-off. Thirty-five; forty; forty-five. *Bang!* The right-hand tyre exploded as a .303 crashed through cover, tube and rim. Erich pulled back on the stick. The 'plane staggered into the air then sank slowly back to the ground. As the punctured tyre hit the earth, the Spad slewed round in a half circle. Erich ruddered hard left, but it was too late. The weakened rim collapsed, the undercarriage "vee" dug in and a wing-tip buckled. Over the Spad went in a cartwheel and the propeller burst just as he switched off the ignition.

Having had no time to fasten his safety-belt, he was catapulted out of the cockpit and flung through the air. He landed with a thud which knocked all the breath from his body, rolled over and over like a shot rabbit, and lay still.

WHEN Erich recovered consciousness, night had fallen. For a minute or two he lay still with closed eyes, trying, without immediate success, to recollect what had happened. Slowly he pieced together the events which had led up to the crash which he now remembered.

Opening his eyes, but without moving, he looked about him. A square of cracked ceiling with laths showing where the plaster had fallen away was the first thing which met his gaze. He wondered where he was. With infinite care he turned his head slightly and saw a khaki-clad figure with a red-cross brassard on his sleeve. He was busily rolling bandages against his knee by the yellow light of a kerosene lantern.

The sight of these made Erich wonder if he were badly hurt. He raised his arm and touched his forehead tentatively. In place of the usual crop of fair hair his fingers came in contact with something which felt like a linen band. There was a smell of iodoform. His head ached and he dropped his arm with a smothered groan as he realised his helplessness. Hearing the sound, the orderly rose and crossed the room.

"'Ow yer feeling now, mate?" he enquired professionally.

Erich looked up at the friendly freckled face and smiled.

"*Ganz gut*" (pretty well). "*Sie sprechen Deutsche hein?*"

The R.A.M.C. man shook his head, recognising the nature of the question.

"Not a blinkin' word," he assured him. "'Ow yer feelin'? Like a drink of water?"

Erich nodded shortly, although the slight action made his head swim. The orderly went out of the room, leaving the door ajar. Erich slipped off the narrow cot and discovered, to his surprise and delight, that although he was bruised and sore all over, his limbs still functioned.

He sank noiselessly back on the cot and closed his eyes just as the orderly returned with a tin mug of water.

With a desperate plan slowly maturing in his tired brain, he allowed the man to help him to a sitting position, drank the water held to his parched lips, although he noticed it tasted strongly of chloride of lime, and sank back with a groan which was only half pretence.

"If I could only get him out of the way for a while, I'd risk it," he thought "Presently I shall ask for some food Perhaps it might work. I must get back,"

he muttered softly. "I must get back. So much depends on it—so much. *Ach! was ist das?*"

Heavy footsteps were ascending the creaking stairway and he heard voices. One seemed to be remonstrating with another. He could not catch the words though he strained his ears to their utmost.

The door opened and the orderly rose and stood smartly to attention. Two English officers entered. The first wore little red tabs on his collar, gold oak leaves on his cap and a triple row of ribbons on his tunic. He was a large, paunchy man.

"*Der Herr General,*" thought Erich, his eyes mere slits.

The other was bareheaded, and had no ribbons.

"How is he?" demanded this latter of the orderly.

"Not so good, sir. Give 'im a drink of water just now, sir. 'E was that weak I 'ad to 'old 'im up while 'e drunk it, sir."

"Did he say anything?" interposed the General quickly.

"Somethin' in the 'Un lingo, sir, but I couldn't catch on to wot it was, sir."

The General laughed shortly.

"Hurrumph! In German, eh? The fellow speaks English as well as you or I," he said, turning to the other. "At least, so the men said who brought him in. See if he's conscious, doctor."

The medical officer bent over the bed and spoke quietly.

Erich took no notice, but continued to breathe regularly.

"Shake him," said the General briskly. "Burn feathers under his nose or whatever you fellows do. I want to interrogate him."

"Sorry, sir," protested the Medical Officer curtly. "But he's got concussion. It might do him a great deal of harm. He is sleeping quietly now, I can tell from his breathing, and that's the best thing . . ."

"Sleeping? Well wake the blighter up," ordered the General.

"But, sir," expostulated the other, "it . . ."

"If you don't, I will," threatened the General, taking a step forward.

STILL protesting, the Medical Officer bent down and shook Erich's shoulder.

Erich realised he had to wake up, and did so as naturally as he could.

"Ha!" exclaimed the General gustily. "Thought that would do the trick. Now then," he began, clearing his throat, "I want to know how many of your pilots got back this afternoon?—that's the first question."

Erich looked at him through heavy lids, then shook his head slowly with a vacuous grin.

The General repeated the question, with the same result.

He tried again, this time in very fair German, but Erich continued to shake his head slowly from side to side.

Did they think, these fools of Englishmen, that he would answer their questions? He—a Prussian—a von Breitaugen? They would get nothing out of him.

After a while the General gave it up as useless.

"Dense as mud—or as obstinate as the Devil!" he swore angrily as he took his departure. "I'll try him again later. We must know if any of his fellows got back. The Flying Corps people say they bagged the lot, but it's absolutely essential we should get confirmation. Even if only one of them returned after penetrating so far behind our lines, it's all up with the attack."

But the Medical Officer was not quite happy in his mind. Good though Erich's acting had been, he had noted the light in the prisoner's eyes, disguised though it had been, was not quite that of one suffering from severe concussion. And he had seen plenty of it.

Ten minutes later, therefore, a couple of stretcher-bearers clumped up the narrow stairs, deftly removed Erich von Breitaugen from his cot and bore him down below. There he was placed on a cot in the cellar of the farmhouse and the door locked upon him.

Left alone, he swore gently to himself.

"Is this the way they treat wounded

prisoners ? " he muttered disgustedly. " Now my plan is useless."

He stared morosely at the lantern on the floor and at the huge shadows its frame flung on the ceiling beams.

So far as he could see, the place was escape-proof, being composed of stones firmly cemented together, and without a single window.

Hearing no sound without, he rose quietly and moved stealthily about the little cellar. He tried the door first. It was strongly built and fitted well into the jamb on either side. Furthermore, he found there was no handle on the inside and the hinge butts showed it opened inwards. Then, in the midst of his investigations, he heard the sound of approaching voices, one of them speaking in German.

" I tell you," its owner was remonstrating angrily, " I am an officer and a gentleman. Keep your filthy hands off me ! "

Erich hurried back to his cot, pulled up the brown army blankets, and, as the key turned in the lock, was apparently fast asleep.

" In you go, Fritzie," ordered a harsh voice. " Keep yer 'air on."

" *Schweinhund !* I'll make you and all your *verdammt* countrymen suffer for this when we reach London ! "

CHAPTER III

The Ruse that Failed

ERICH VON BREITAUGEN opened his eyes as soon as the retreating footsteps had died away up the stairway. He saw a man in the uniform of the Imperial Air Service looking down upon him with a smile.

" So," said the new arrival, " they have captured two of us *hein ?* They told me I would find company here. Two eagles in one small cage. What is your name, *mein freund ?* "

Erich told him. " And yours ? " he asked.

" Otto von Guzmann. Are you badly damaged ? Your head ? "

Erich smiled and told him the extent of his injuries, adding, " My head buzzes like an overturned beehive, but that is nothing. I am stiff and sore all over, like—well, as if I had been flogged at the wheel—but that is nothing either. What matters is that I have most important news to convey to Excellenz. Together we must escape."

Otto von Guzmann seated himself on the edge of the cot as Erich curled up his long legs to make room for him.

Since the stranger was now facing the light, whereas before he had his back to it, Erich had a better opportunity of inspecting his companion in misfortune. He saw a man of about his own height though perhaps of slightly heavier build, his tight-fitting tunic as immaculate as his highly-polished field boots.

For a time they chatted of their mutual misfortune, and Erich somewhat to his surprise, found his visitor keenly interested in whatever he could tell him of the latest in their country's aircraft.

" But why is it, *mein freund,*" he asked suddenly, " that you seem to know so little about our latest developments ? How long . . . ? "

The other laughed easily. " If you had been on the Eastern Front, where we have only old machines, as long as I have, I have no doubt you also would be interested."

" Yes, of course," assented Erich thoughtfully. " When did they bring you down ? "

" Two days ago. I am still here instead of in one of their accursed prison camps because I refuse to tell them anything. But they torture one—*mein lieber Gott*—how they torture one, but I say nothing ; not a word," he protested proudly.

" Torture ? Is that true ? " asked Erich quickly. " They have always warned us about that, but I never quite believed it."

" Wait," answered Otto meaningly. " You will see without doubt."

He fished in his pocket and produced two small cigars.

" Is your head too bad to enjoy a smoke ? " He held one out.

" *Danke schön,*" accepted Erich, somewhat surprised, since all his own possessions had been taken from him. " How

did you manage to keep these ? " he asked, biting off the end.

Otto shrugged his broad shoulders. " Overlooked, I suppose."

He took a box of matches from his pocket and struck one, and for a while they smoked in silence.

Erich was thinking deeply. How was it, he wondered, that this fellow-countryman of his looked so neat and tidy ? His tunic was creaseless, his boots shone, he was freshly shaved : he had matches and cigars, whilst he himself was dirty, his tunic and breeches torn and everything he owned had been taken from him.

It was very strange. He would ask him. But even as he took the cigar from his mouth to put the question, he hesitated as a new thought struck him. This pilot said he came from Württemburg. Strange ; he knew several Württemburgers, and none spoke in this dialect. This man spoke more like a Bavarian ; and yet not quite. He wondered. Then a new idea came to him. It was a silly thing perhaps. He had read it in a book once—a book of detective stories. It had said that a man, suddenly startled, invariably swore in his mother-tongue. It might not be so, but it was worth trying.

He flicked the grey ash from his cigar and leaned forward.

" Listen, von Guzmann," he said in a low tone, " bend your ear towards me. We must not be overheard."

The other leaned forward, his eyes lighting up expectantly.

" None can overhear," he said. " You can speak safely."

As Erich bent towards him, the glowing end of his cigar made contact, as if by accident, with the back of the other's hand as it lay on the cot.

" Damn and blast your hide ! " Otto spat savagely, jerking his hand away in pain. " You've burnt me."

" *Ach ; Ich bin sehr traurig* " (Oh, I'm awfully sorry) replied Erich contritely. " *Das war sehr ungeschicht.* " (It was very clumsy of me.)

" *Ja wohl,*" agreed Otto, sucking his smarting hand. " *Sie sagten ?* " (What were you saying ?)

" *Nichts,*" answered Erich slowly, rubbing his hand across his eyes. " I have forgotten what it was." And he wondered if his companion realised his slip, for his own knowledge of English was such as to assure him that the vernacular had leaped quite spontaneously and with perfect accent to the other's tongue.

His mind was made up instantly, but he wondered uneasily if he had the strength to carry out what he must now do.

" Help me to get up," he pleaded. " We cannot stay here. Perhaps we can find some way out."

Otto shook his head decisively. " Quite impossible. The walls are very thick and there is a guard at the head of the stairs."

" Nevertheless, we can try," persisted Erich. " Come, give me a hand. My head buzzes, but I think I could stand if I got on my feet."

Half a minute later he was swaying on his heels as if from utter weakness, but all the time he was exulting inwardly as he felt the strength returning to his muscles. If only his head did not ache so much. He took a few halting steps round the small cellar, coming at length to a stop before his companion, who was eyeing him thoughtfully.

" Not so strong, *hein ?* Better get back to bed," he advised.

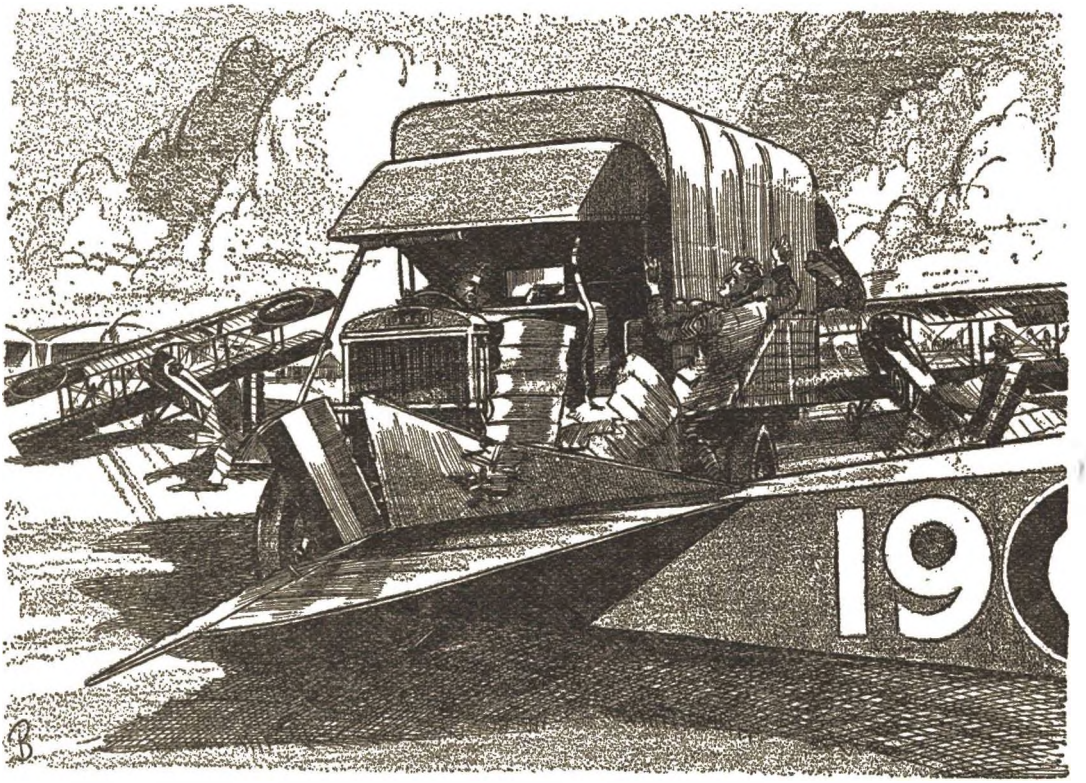
" What's that ? " questioned Erich suddenly, pointing towards the low ceiling above the other's head.

Otto looked up quickly. There was nothing there nor, a split second later, was there anything on the spot where, a moment before, he himself had stood. But some four feet away, in a crumpled heap, lay the twitching body of the man in the too-dapper German uniform.

FOR a while Erich stood there gently massaging his bruised knuckles.

" Of a surety," he muttered somewhat ruefully, as he looked down at the unconscious figure on the stone floor, " these English have chins of granite. Twice in one day. *Ach !* "

Listening carefully for any sound from



A flight-sergeant sprang for the running-board and fell back with a bullet in his shoulder

outside, he knelt beside the body, then, stripping, he put on the other man's clothing, afterwards dressing him in his own torn and stained uniform. His new uniform was a little loose, but not conspicuously so. He hated to leave behind him his old leather flying coat, his companion in so many aerial encounters, but it could not be helped. With difficulty he hoisted the insensible man on to the empty cot, threw the blankets over him and used a fold of his own head bandage to simulate one on the other's scalp. Fortunately, Otto's flying cap was large and hid his own bandage effectually.

There was one matter which caused him great satisfaction, removing as it did any vestige of doubt which might have lingered in his mind as to the status of the man on the cot. In his pocket he had found a fully loaded automatic pistol —scarcely, he thought, an object likely to have been overlooked even if two cigars and a box of matches had escaped notice.

He knocked on the door. There was no response, so he knocked again. A door opened and footsteps clattered down the stairs.

"'Ullo there," came a voice from outside.

"*Offen Sie die Thüre*" (Open the door) he ordered curtly, and a few moments later he stood outside with a British Tommy who, armed with a service revolver in one hand and a lantern in the other, poked his head inside the cellar before locking the door again.

"Can't get anything out of him," Erich explained with a faint smile, indicating the English agent. He tapped his head significantly.

"Lead on."

HE followed the man upstairs, thinking how easy it would be to put a bullet in his back, and what a useless procedure it would be.

As they reached the landing at the top of the stairs, he spoke again.

"I'll wait here while you present my compliments to the General and ask when he will see me."

"Very good, sir. 'E's in this 'ere room. Won't be a jiffy, sir."

He tapped on the door and entered, whilst Erich, stepping gingerly, walked through the outer door into what smelt like a barnyard. But it was so dark he could not see anything distinctly. He hurried round a corner and ran full tilt into a stationary figure.

"'Ere, 'old 'ard," came an aggrieved voice. "'Alt. 'Oo goes there?"

"Friend," answered Erich quickly.

"'Alt friend an' be reckernized," came the curt command, and Erich felt rather than saw a thin bar of cold steel held near his chest.

RECOGNITION was the last thing Erich desired at the moment. He did not know the name of the individual he was impersonating, and he was extremely doubtful if the sight of a German officer would be a reassuring one to a British sentry. Therefore, he prevaricated.

"I've just been visiting the General," he explained, "and am on my way back to my quarters."

"That's all right, sir," said the invisible owner of the voice, somewhat mollified, "but my orders is that everybody's got to be questioned after nightfall. You just 'alt there, sir, while I get the corpril of the guard."

He blew a blast on his whistle and hurried steps shortly made themselves heard. Just then there came the sound of angry voices behind him, and Erich heard the strident tones of the General he had already encountered once before.

"But where *is* he? Why the devil didn't you bring him in to me at once. Confound you: where the deuce can he have got to?"

Caught between two fires as it were, Erich stood greatly perplexed. The sentry's bayonet was still not a foot from his chest. The hurried footsteps—doubtless those of the "corpril"—had almost reached them. Behind him were the stentorian tones of the General demanding to know what had become of him. It was, at the least, a difficult situation.

Just as the N.C.O. arrived an idea struck him. It seemed a long chance, but the only one that offered.

"Ah, here you are, Corporal," he said disarmingly. "Your sentry very properly challenged me. If you will kindly take me back to the General, he will identify me."

"Very good, sir. Just come with me, I can hear him now."

"So can I," said Erich without enthusiasm.

"Just in at that door, sir," said the Corporal a few moments later, halting near the opening.

"Thanks very much," answered Erich advancing towards it steadily. "Good night."

"Good night, sir."

He reached the door, passed it without a glance, and hurried on.

"You've gone beyond it, sir!" shouted the Corporal, evidently waiting to satisfy himself.

"I know that," muttered Erich as he broke into a run. His eyes becoming more accustomed to the darkness, he saw something on the far side of the barnyard, and it presented a faint glimmer of a chance to escape. It was a powerful car, grey in colour and with a couple of little flags in front, such as Excellenz used to drive in. He ran towards it and climbed in. "Yessir," said a sleepy voice from behind the wheel. "Where to, sir?"

"Start her up quickly," he ordered in tones of authority. "I'll tell you as we go."

The man jumped down and ran to the front of the car.

"This is General Dawson's car, sir," he said doubtfully. "I . . ."

"I know," gritted Erich, "I am carrying out the General's instructions. Quick."

The engine purred into life, and the driver slipped behind the wheel. A few moments later they were out of the yard, speeding into the blackness, whilst a tumult of shouts broke out behind them, amongst which Erich was certain he

could recognise the booming tones of General Dawson.

"Drive to the aerodrome," he ordered. "I have despatches for the Officer Commanding."

"Which 'drome, sir?"

The question was a poser. Erich had a fair idea as to the location of the Allied aerodromes in the sector where his Jagdstaffel operated, but could not tell in the least where he now was.

He temporised. "The nearest one," he said, hopefully.

"That'll be Roubiers, sir, won't it?" enquired the driver.

"Yes—Roubiers. I have orders for Major Sharpness."

"Very good, sir."

Erich von Breitaugen leaned back and sighed with relief. That had been easy. So he was near Roubiers, was he? He knew Roubiers, and, very naturally, knew its commander by name and reputation, and also by the red muffler he always wore. They had met in the air more than once and he remembered thankfully that he was alive now only because the *gut Gott*, who fought on the side of the All Highest, had caused this Sharpness to run out of ammunition on a never-to-be-forgotten occasion.

"Somebody coming up from behind sir, ain't there?" said the driver suddenly as the sound of a raucous Klaxon smote upon their ear-drums.

"I think so," agreed Erich anxiously, startled out of his reflections. "Drive faster."

"Can't be done, sir. Not without 'eadlights, sir."

"Then switch them on."

"Orders are, sir, we mustn't use 'em till we get past . . ."

"And here is something which tells you you must," suggested Erich, presenting his automatic, at the same time leaning forward and pressing his finger on the row of switches on the dashboard.

Amongst others, these switched on the dash light.

The driver looked sideways at him and Erich almost laughed at the ludicrous way in which his jaw dropped.

"Gawd, sir," he blurted, "if you ain't a blinkin' 'Un!"

"A word I shouldn't advise you to use again," Erich ordered curtly. "Take the first turning we come to."

A minute or so later he saw a road leading to the right. Immediately he switched off the lights. "Turn here," he said, "and go carefully."

The driver did so, and they sat there in silence until, half a minute later, the pursuing car swept past the end of the lane.

"Now turn and follow them, without lights," he said. "How far is Roubiers from here?" he added a few minutes later.

"About four miles, sir," gasped the driver. "Straight ahead."

"Good. Now stop." The car slowed to a standstill. "Get out." The driver obeyed with alacrity, evidently thankful at getting off so easily.

CHAPTER IV

A Lorry Runs Amok

FOR three miles or so Erich drove fast but carefully, with his lights out. Then he stopped, opened the door, put the car in low gear, let in the clutch and jumped to the ground. As he did so he opened the hand throttle. The car slid away and shortly overturned in a ditch, its rear wheels spinning in the air.

Erich walked on towards Roubiers. The dawn was breaking as he saw the row of hangars by the roadside, and reconnoitred carefully. 'Planes were being wheeled from the sheds and their engines tested. The air was full of the rattle and roar of echoing exhausts.

From his place of concealment in a little clump of bushes not a hundred yards from the east end of the tarmac, he could observe clearly what was going on. On the tarmac itself two figures were pacing up and down, engaged in earnest conversation.

He could not hear what was being said above the roar of the engines, but he recognised the two men.

One was Major Sharpness, whose red muffler was plainly visible in the half

light, and the other was General Dawson.

In their absorption they passed beyond the strip of tarmac and approached the clump of bushes where Erich lay concealed.

Flattening himself, he buried his face in his arms and lay listening.

"Well, if you haven't seen him, you haven't, and that's that," the General was saying. "He was seen heading this way, but he may have gone past, or have turned off somewhere. I only hope the devil hasn't got his information through yet. There'll be merry hell to pay if he has. The advance, as you know, is timed for to-morrow morning and if the Huns get wind of it they'd have time to . . ."

But by this time the speakers had turned back, and their voices faded away in the distance. But Erich had heard enough.

"To-morrow morning," he muttered. "*Vier und zwanzig horen. Ich bin sehr glücklich gewesen.*" (Twenty-four hours. I've been very lucky.)

He rose silently to his feet and stepped gently back into the bushes, then, moving to the roadside, made his way cautiously towards the rear of the hangars. A string of five-ton lorries was parked behind them, and into the first of these he crawled. Its brown tarpaulin cover would provide him with an excellent temporary hiding-place, and as such he intended to use it, but a glance at its contents suggested a plan whose sheer audacity made him catch his breath.

It seemed that the Quartermaster had been using the lorry for storing spare equipment for the troops, for it was filled with neatly-tied bales and bundles of uniforms and blankets.

Erich was partly right, but not entirely. What he did not know was that the squadron had received orders to move to their new aerodrome at Villeron, and that the lorries had been loaded overnight with stores.

However, that was a detail which did not matter. All that concerned him was that he could now cover his tell-tale tunic with an R.F.C. great-coat, and put one of the funny little caps with the bronze badge on it on one side of his head. He grinned to himself as he tried one on, then winced as he felt its pressure against his bandage. Then he stuffed his flying cap into his pocket and climbed gently to the ground. The first and easiest part of his plan was accomplished. What was to come was far more difficult and dangerous. He switched on the ignition and bent to the starting handle. It was no easy matter, he found, to start one of these powerful engines from cold, but in a couple of minutes he was up in the driver's seat of the heavy Leyland, the sound of his activities drowned by the barking exhausts of the Spads on the tarmac.

Grasping the wheel, he laid his automatic on the leather seat beside him and let in the clutch, his scalp pricking with excitement.

Making a wide detour he drove on to the tarmac from the far end. A dozen 'planes were there in perfect alignment, and all had their engines running.

Two or three men looked up from their tasks as the great lorry lumbered past them, but, presuming the air mechanic in khaki behind the wheel had his orders, they took no notice.

ERICH VON BREITAUGEN then began the most awe-inspiring performance of his whole career; a stunt which he was never tired of recounting to his friends in after years; nor did they ever tire of hearing it.

He put that five-ton Leyland into top gear, let in the clutch and, pressing the accelerator right down, he charged down the line of Spads at about twenty miles an hour.

Bing! Crash! The radiator and offside front wheel crashed into the tail assembly of the first in line. By the time he reached the second, number one had slewed round, slid between the chocks and started towards the sheds. By the time he reached the third, number two was on its way across the field on a zig-zag course, its empennage sagging drunkenly behind it.

By now the whole aerodrome was in

an uproar. Men came running ; swearing as they ran. A flight-sergeant sprang for the running-board, and fell back with an automatic's bullet in his shoulder. Frantically the mechanics sprinted to remove the remaining Spads from the path of the lumbering Juggernaut, but only two were saved. One was the last but one in the line, and a figure with a blood-red muffler round his neck leaped from nowhere and overrode the chocks just as Erich reached it.

Erich slammed on the brakes, leapt from the lorry and ran for the last 'plane on the line. Reaching it safely, he put his foot in the stirrup and hoisted himself aboard.

A fleet-footed pilot flung himself upon him. Erich's pistol hand rose suddenly ; there was a sharp crack and the youngster fell backwards with his hands clutching his head.

A moment later, as he threw open the throttle, he heard the familiar *rat-tat-tat* of a machine gun and saw that the tail of one of the 'planes had been elevated by two mechanics, and that someone was firing at him with a Vickers gun. The bullets went wide and he sped down the field followed by a salvo of shots from such few weapons as could be found in this unexpected emergency.

The last thing he saw from the tail of his eye was a portly figure with oak leaves on his khaki cap jumping up and down on the tarmac and shaking impotent fists at him.

CHAPTER V

An Armada Sets Forth

ERICH VON BREITAUGEN lost no time in circling for altitude. He was by no means certain of the best climbing angle for a Spad, but excellent pilot as he was, he got the feel of it in the first thousand feet. Thereafter he kept on climbing with the nose of his stolen 'plane pointed due east.

He had forgotten completely about the 'plane which had got away, and was therefore no little surprised when a burst of tracers bit through the fuselage behind him. He jerked upwards in his seat and sideslipped away, with bullets flailing his right upper plane.

Pivoting on a wing-tip, he banked round. Sharpness must have kept step with him, for he never saw him. He dived, came out of the top of a loop in a half roll, and a hail of lead spattered on his cowling. Then he saw Sharpness slightly below on his off-side forward quadrant. The two 'planes sped towards each other, twin darts of fire spurting from Vickers muzzles.

" *Mein Gott !* A collision ! " screamed Erich, pulling up at the last possible moment. He felt the 'plane shudder as the Englishman sped beneath him, and closed his eyes momentarily. Then, as the engine still turned over regularly and the controls seemed to function, he opened them again. Banking carefully round, he looked beneath him.

Already far below he could see the other Spad slowly spinning with something that looked like loose fabric blowing back from its top centre-section. Then he lost sight of it in the ground mist, and ruddered for home.

Some half an hour later he switched off his engine at fifteen thousand feet and started to glide into his aerodrome. He had no desire to be fired upon by his friends so he chose to come in with a dead engine, trusting to be able to land without being observed.

But Fate decreed otherwise, for whilst still two miles above the earth he saw gaily coloured specks flying beneath him, the rising sun shining upon their satiny dope.

A few minutes later he was surrounded. Seizing the stick between his knees, he raised both hands in token of surrender.

He grinned to himself as he saw the surprise on the faces of his friends as they escorted him downwards. Obviously they could not understand how the pilot of an English Spad, wounded in the head though his bandage proclaimed him, should submit to capture so tamely.

Erich was, however, surprised in his own turn that none seemed to recognise him, not realising that the blood from his re-opened head wound had spread and congealed on his oil besprinkled face.

Closely shepherded by his escort he landed, and as his wheels lightly grazed the turf he congratulated himself on his neat landing in a strange 'plane.

"*Heisa ! Wie geht's Oskar ?*" ("Hello ! How are you Oskar ?") he shouted joyfully as his friend, Unter-Leutnant Oskar Reuter, ran to his side, with a Luger in his hand.

The muzzle of the pistol dropped suddenly and Erich laughed again at the ludicrous expression on his friend's face as he slowly recognised the pilot of the English Spad.

"*Was hast Du . . .?*" (What have you . . .?) began Oskar, when he was pushed roughly aside by an enormous fellow who leaped from the seat of a throbbing Benz touring car.

Instantly Erich von Breitaugen and those crowding about the machine stiffened to attention as they recognised the General's Chief of Staff.

"Who is this ?" he demanded impatiently, pointing to Erich.

A chorus of voices informing him of the astonishing truth, Erich was ordered forthwith into the waiting car and whirled away to the General's H.Q. to the vociferous accompaniment of rousing cheers from the squadron members.

Unwashed, dirty, blooded and unshaven —no wonder his comrades had not immediately recognised the usually dapper pilot—Erich was ushered into the presence of General von der Stahl.

"Excellenz," he reported, standing stiffly to attention, "I have the honour to report the reconnaissance has been successful. Have I your permission, Excellenz ?" he bowed from the waist and leaned across the desk. "There," and he pointed with a pencil, after poising it thoughtfully over the map between them, "is the ammunition dump we were sent to search for. It is enormous, Excellenz, and the concentration is complete. The attack is timed for tomorrow. I learned it from the lips of the Herr General Dawson himself. The other gentlemen of our Staffel, Excellenz, I regret to say, were killed," he added softly.

For a few moments there was silence in the little room, then von der Stahl put half a dozen curt, incisive questions.

Then he heaved himself to his feet and stretched out a large and mottled hand.

"*Ganz gut, Leutnant von Breitaugen.* I am satisfied with you. I shall recommend you for reward. Within limits you may ask what you will. You have my permission to speak."

Erich von Breitaugen's eyes sparkled with pleasure at the warmth of the great man's rare praise.

"Excellenz," he pleaded earnestly, "I have but one desire—to serve *der Vaterland.* I beg, Excellenz, that I may fly one of our bombers when we destroy their dump."

"My son, who was killed last year, would have been such as you had he lived," replied the General, with a bleak smile which so seldom softened that grim mouth. "Request granted."

LATE that afternoon ten Albatros C.3 bombers, their 160 h.p. Mercédès engines drumming out the aerial miles, left for a tiny spot on the Allied side of the lines pin-pricked on the map of their leader. One of them was piloted by Erich von Breitaugen.

Escorted by a strong flight of Halberstadts and an entire squadron of Fokkers, the armada set forth.

What happened subsequently, whereby the long-prepared British advance was completely frustrated, is probably better expressed by one Second Lieutenant Billy Landers, one of the few pilots in the R.F.C. who returned more or less unscathed from the attempt to ward off the attack, than by any other eye-witness.

He was a taciturn youth, not given to verbosity. As he staggered into the mess and called through powder-caked lips for a very large Scotch, he summed up the whole gigantic German success in these half a dozen short words, addressed to the batman-waiter in the argot of the R.F.C.

"They did the dirty on us."

Lt. L. T. E. Taplin—a Sketch from a Wartime Photo

An Ace from the Engineers

To-day a Forgotten Hero of the War in the Air, Lt. L. T. E. Taplin, Australian Air Ace, Once made History in the War Skies of Palestine and France

By
A. H. PRITCHARD

SO long as men continue to admire brave deeds and gallant patriotism, the names of Britain's famous "Aces" of the Great War will remain immortal. It is right that such heroism as theirs should live in history, but what of the many thousands of warbirds who gave of their best, yet never made the headlines? In our own air services there were over 250 men who destroyed anything from seventy-three to five enemy aircraft each, but who can now name one-tenth of them?

It is surely time that some attempt was made to record the deeds of these forgotten heroes, and from time to time this series will include a short biography of some unknown warbird whose chest is unadorned by strings of medals, but who was ready to answer with his life when his country called.

Typical of these unsung heroes is Lieutenant L. T. E. Taplin, of No. 4 Squadron, Australian Flying Corps, holder of the D.F.C. and victor over twelve German airmen. Born at Unley, near Adelaide, Australia, on December 16th, 1895, Taplin left school to study electricity, and when war broke out he was in business as an electrical engineer at Parramatta, Sydney. Naturally enough for a man of his technical ability, Taplin first saw service in the Royal Engineers, but transferred to the Royal Flying Corps in the midsummer of 1917. He could, no doubt, have secured a "soft" berth far behind the lines, but, like so many of our brothers from "down-under," adventure called, and his ultimate destination was the aerodrome of No. 1 Squadron, Australian Flying Corps, "somewhere in Palestine."

There was little opportunity for a bloodthirsty airman flying an old B.E.12a over the desert wastes, and Taplin had to be content with an odd bombing raid or an occasional strafe of "Johnny Turk" and hostile Arabs. On January 17th, 1918, however, he was out on a photography detail over the Nablus hills, when opportunity appeared in the shape of an Albatros D.3. When the enemy machine attacked, Taplin had the "stick" between his knees and was patiently dismantling his camera which had jammed a few seconds before, and his first knowledge of danger came in the shape of four bullet holes in his leather coat. Turning on his attacker, Taplin opened fire, but after one burst his gun

jammed. Meanwhile, the Albatros had dived, and Taplin had time to clear his gun before the enemy machine could pull out. Twenty rounds sped from the Australian's single Vickers, Herr Albatros hurtled to destruction on the desert twelve thousand feet below, and Lieutenant Taplin resumed his interrupted camera repair.

Several other daring, but unsuccessful, fights with enemy 'planes marked Taplin for something better than plodding two-seaters, and in due course he returned to England, and was trained on Sopwith Camels at Castle Bromwich. Then followed the usual hustle of wartime training, and early in June Taplin was posted to No. 4 Squadron, A.F.C., at Rockingham, a fully qualified Camel pilot. He soon got into the thick of things, for on July 17th he was out searching for his flight, having been delayed by engine trouble, when he was attacked by four Pfalz D.3's. By a brilliant piece of flying he demoralised the enemy formation, and the Germans gave him up as a bad job. Left to his own resources again, Taplin flushed a couple of Albatros two-seaters near Estaires, and one went down minus its wings.

On July 26th he had one of the narrowest escapes from death ever recorded, and it all happened on his own aerodrome. While taking-off on a bombing raid, his undercarriage hit a bump and the axle snapped. Luckily for Taplin, he had undone his safety belt, and when his 40-lb. incendiary bomb exploded it threw him clear of the wrecked Camel. Still he was not out of danger for, ignited by the phosphorus bomb, his ammunition belts and Verey lights went off, and for ten minutes he was shot at by his own machine-gun.

Despite the pain of a few minor burns and bruises incurred in this adventure, Taplin was in the air again on the 30th, and destroyed a Fokker D.7 near Armentiers. His ability as a pilot had not gone unnoticed by his C.O., and on the 31st he was appointed temporary flight leader and sent out at the head of six other Camels. Flying at ten thousand feet over Nieppe Forest, Taplin spotted eight Fokkers below, and immediately led his men to the attack. Only three enemy machines escaped the Australian attack, and Taplin had bagged one in flames and two " out of control."

Drama of a Dawn Patrol

TAPLIN'S fifth victory was acquired at the expense of an L.V.G. on August 3rd, and was the result of a very tough fight. While out on a dawn patrol he met an L.V.G. over Merville and fired a thirty-round burst at its belly, directly beneath the pilot's cockpit. Shock number one—the L.V.G. flew serenely on, while the observer calmly swung down his Parabellum and opened fire. Then came shock number two, for a bullet struck the cowling directly in front of Taplin, and immediately burst. Taplin must have smiled grimly at the sight for, like every airman in France, he knew that the use of explosive bullets was forbidden in warfare unless used against balloons—and an L.V.G. was certainly no " balloon-strafer." Dazed by the explosion, he allowed the Camel to fall into a spin, but pulled out quickly and charged the L.V.G. head-on. This time he made no mistake, and the two-seater fell with its engine riddled. When the wreckage was examined, it was found that the underside was completely armoured, and the gun-belts were loaded with explosives in a ratio of one in four. Incidentally, Taplin's experience on this occasion led to the order for British pilots to carry explosive bullets, an order which aroused fierce controversy, for, according to international law, an enemy pilot found with such ammunition could be shot.

Taplin's next victory came whilst out on a bombing raid with two companions. While strafing a German strong point at Pont-du-Hem, he spotted two Albatros D.5a's, and motioned to his companion to stand by and guard him against possible attack from above. One burst and an Albatros was falling in flames, while the other was heading for home with wide-open throttle.

Taplin was no student of aerial strategy or tactics, but he was a fine pilot

and a dead shot ; in fact, he was just one of those " men-of-all-work " who were the real backbone of our air services, and was a very useful bomber. In addition, he seems to have had a remarkable knack of extricating himself from tight corners and emerging unscathed from the most hair-raising experiences.

Take, for example, the occasion of his next victory, on August 9th. While out with a patrol over La Bassee he became separated from his companions in a heavy cloud bank and decided to carry on alone. The first enemy machine he encountered was a Hannoveraner, most formidable of all the enemy two-seaters, but Taplin got in a lucky burst and it fell in flames. Seeing the " Hanna's " fate from afar, four Fokker D.7's came plunging after Taplin, who managed to dodge them in the clouds. Coming out to check his position, he almost rammed the leader of a five-machine formation of Pfalz Scouts, but again escaped into the friendly clouds.

His final encounter on this busy morning was with another Hannoveraner that he found " strafing " the advancing Tommies. This proved to be a tough nut to crack, and in the end the Australian had to give up, owing to shortage of ammunition. His luck was certainly good on this day, for he flew from over thirty miles inside the German lines without a single round for his guns, and any enemy machine that had shown up could have riddled him. As it was, he flew across the busiest part of the enemy terrain without sighting a single black-crossed machine, and eventually glided the last five miles to his aerodrome with a bone-dry petrol tank.

Harrying the Retreat

WITH the enemy falling back all along the line, the activities of the Australian squadrons increased ten-fold, and from dawn to dusk their pilots harried the retreating Germans, destroyed their ammunition dumps and periodically shot up the aerodromes at Lomme and Haubourdin. Mass raids and formation flights were the order of the day, and for three weeks Taplin flew merely as a unit in a seventy- to eighty-machine formation, firing his guns and dropping his bombs according to instructions.

On September 1st, however, Taplin and Captain R. King decided to do a little private hunting for a change, and went out long before the daily raids were due to start. Their objective was the balloon line at Aubers, and both pilots sent a " sausage " down in flames, afterwards proceeding on their routine job of bombing the Don railway junction with an added zest. During that night the enemy evacuated all their positions around Armentiers, and in consequence the Australians found no German aircraft to fight on the following morning, whereupon they vented their feelings on anything German that appeared on the roads below.

Despite this lack of opposition, Taplin scared up a two-seater near Fromelles and sent it down in flames. That evening the Australian pilots discussed what was to be done during the absence of the enemy 'planes, and after much argument they decided to amuse themselves at the expense of the much-abused balloon line on the Aubers Ridge. Lots were drawn as to who was to be the first player of the new game, and it was agreed that if the winner sent his target down in flames he was to be entitled to another shot. Taplin won the draw and arrived over the balloon line just as two *drachens* came up. A gush of flame and smoke marked the passage of one balloon, and then " Archie " went mad. " Flaming-onions," tracer bullets, light shells, in fact, every shape of small arms ammunition imaginable crashed and banged around Taplin, and three of his comrades came down to help him out. While they settled with the defence force, Taplin pounced on the other balloon, and its flaming débris fell across the dead bodies of its winch crew.

Next day no balloons went up from Aubers, so Taplin went further afield and destroyed a balloon on the Perenchies line.

The morning of Taplin's last day in the air saw a plan being formed for a

great drive which was to knock down all enemy 'planes in its path. Five Camels from No. 4 Squadron, led by Lieutenant N. C. Trescowthick, were to contact ten S.E.5's from No. 2 Squadron, and a similar number from No. 32 Squadron R.A.F. The Camels took-off early in the afternoon of September 5th, all unaware of what fate had in store for them, and flew towards Brebieres. For some unknown reason, the proposed contact was never made, and the small formation carried on alone. By a cruel irony of fate they passed over Brebieres at the exact moment that three German squadrons were returning to the front.

The Germans, whose formations held a number of machines from the Boelcke Staffel, were three thousand feet higher than the Camels, and Trescowthick, seeing that it would be suicide to attack such a huge formation, fired the signal to retreat and dived for home. Again something went wrong, for his companions never saw the signal, and, with typical disregard for odds, met the diving Fokkers nose to nose. Against almost ten times their number the four Australians performed a modern "Charge of the Light Brigade," but they were doomed from the start. Lieutenant A. H. Lockley fell in flames, closely followed by Eddie and Carter, and Taplin was left alone. Hemmed in from all sides, he fought on, and three Fokkers went down badly damaged before wounds forced the gallant Taplin to a crash landing inside the German lines.

A Gallant Company

THE Armistice freed Taplin from German prison hospitals, and on his return to Australia he passed into oblivion. To-day he is probably an ordinary civilian, perhaps still in a little electrical business somewhere in the backwoods, and no doubt it is only with difficulty that he can be persuaded to talk about the days that are past. For it is not in the nature of such men to seek either fame or reward ; they are content to remain unidentified members of that gallant company, the unknown heroes of the War in the Air.

AIR BOOKS

Reviews of the Latest Books on Aviation

THE WAR OF 1938

"Four Days War": By S. Fowler Wright: Robert Hale & Company: 7s. 6d.

IN 1938 Germany delivers an ultimatum to England which it is impossible to accept. The result is immediate war, in which England, allied with France and Japan, finds herself opposed by Germany, Russia and Poland, until, later, the United States throws her weight into the balance on England's side.

It is, of course, mainly a war in the air. The author does not describe any aircraft types or equipment in particular—other than a mention of six score Fairey Fantômes belonging to the Canadian Air Force—but draws a general picture of war in the air, painting with vivid realism the bitterly contested aerial combats, the chaotic consequences of successful raids and the all-pervading dread of imminent disaster from the skies. A novel point is the employment by Germany of a new weapon in the form of bombs containing a freezing gas, the effect of which is to produce a temperature so low that its victims are instantly frozen to death.

It is possible to quarrel with the author in making Russia ally herself with Germany, bearing in mind their present vitally opposed viewpoints and the fact that the War takes place as soon as 1938, but the alliance of these two great air powers does serve to add point to the author's plea for increased armaments. Further, the harrowing tale he unfolds of an unprepared England called upon to face colossal odds and to suffer terrible havoc suggests that he has no great faith in the immediate efficacy of the huge Air Force expansion scheme in which we are at present involved.

But Mr. Fowler Wright certainly knows how to tell a story, and if the leading characters, who include an English pilot-spy and a girl he rescues from Germany, are rather eclipsed by the magnitude of the events taking place around them, the horrors of intensive aerial warfare are made very real to the reader, whose interest is sustained throughout by the desire to know the ultimate fate of Europe. But for this he will have to wait for a sequel—or, perhaps, for 1938.

TRANS-ALPINE FLYING

"From Heston to the High Alps": By Douglas Fawcett: Macmillan & Co.: 6s.

MR. DOUGLAS FAWCETT made his first flight as a passenger in 1933 at the age of sixty-seven. Two years later he was the possessor of a Pilot's "A" Licence, with the distinction of being the second oldest "ab initio" pupil in this country to have qualified for the certificate. His considered opinion is that flying is a far from formidable enterprise, "much easier to learn than good skating, and much less dangerous than guideless mountaineering."

So that others may share his new-found enthusiasm he has written this book, of which some two-thirds are devoted to a detailed account of his experiences whilst learning to fly at Heston and to a recital of various hints and tips which he collected, from experience and from various counsellors, in the course of his novitiate. The remainder of the book, and all the excellent aerial photographs with which it is illustrated, are devoted to subsequent Alpine flights, in the course of which the author, piloting his own light aeroplane, traversed such mighty peaks as the Matterhorn, Mont Blanc and those of the Savoy Alps. The alluring picture he paints of the exhilarating joy of these aerial explorations of the High Alps should send all ex-mountaineers of robust age hurrying to their nearest flying-school, eager to replace a form of climbing for which they are now too old with another of far greater charm and no less adventure.

EYES OF THE ANZACS

"The Battle Below": By H. N. Wrigley, D.F.C., A.F.C.: Published by Errol G. Knox, 66 Pitt Street, Sydney.

DURING the Great War, Australia was the only Dominion to raise and operate its own Flying Corps in the field, and of the several squadrons thus raised none was more famous than No. 3, which earned for itself an enviable reputation as one of the most brilliant and efficient Corps Squadrons in the whole of France. How well that reputation was deserved is evident from a study of this squadron history which, without frills or heroics, tells the eventful story of fifteen months' continuous active service in France and Belgium, during which the squadron played its part in such historic battles as those of the Third Ypres, the Somme, Amiens, and the final storming of the Hindenburg Line.

No. 3 Squadron of the Australian Flying Corps went overseas in August, 1917, equipped with the R.E.8's which it used throughout the war. The first unit of the A.F.C. to go on service on the Western Front, it was, for the greater part of the time, attached to the Australian Corps, with temporary diversions to the Anzac and Second American Corps. Its principal duties were artillery-observation and counter-battery work, photographic, contact and "retaliation" patrols, though, as a "maid of all work" squadron, it was liable to be called upon for a variety of other tasks, from laying smoke-screens to drowning the noise made by tanks assembling for an attack.

That the work of the squadron was not accomplished without determined opposition is evident from the many stirring accounts of individual combats and by the squadron's record of fifty-one enemy aircraft destroyed or forced down as against their own total loss of only eleven aircraft—a record the more meritorious since the squadron's primary rôle, which it ably fulfilled, was not to seek out and destroy the enemy but to serve as the eyes of the Corps to which it was attached.

Incidentally, this history lends confirmation to the view that Richthofen fell victim, not to the guns of Captain A. R. Brown, but to a bullet fired from the ground. It records that the post-mortem examination of Richthofen's body, which had been recovered under heavy shell-fire by a mechanic from No. 3 Squadron, was held in one of the squadron's hangars at Poulainville and attended by the Squadron's C.O., Major D. V. J. Blake. This officer states that there was one bullet wound only, the bullet having entered from the right side of the

lower ribs and made exit through the left breast at a point about three inches higher than that of entry. Major Blake also quotes the evidence of numerous ground eye-witnesses of the combat and crash, to the effect that, at the time, Richthofen was chasing a British aircraft so close to the ground that both machines had to zoom to avoid rising ground ahead of them. To this sudden climb is attributed the fact that there was so little difference between the points of entry and exit of the fatal bullet.

The author of this thorough squadron history is Wing Commander Wrigley, D.F.C., A.F.C., who, having served with the squadron first as a pilot, later as a flight commander, and finally as its commander, writes with an authority based on personal experience that is rare among historians.

A COURSE OF FLYING TRAINING

"Guide for Flying Instructors": Published by the Guild of Air Pilots and Air Navigators of the British Empire: 5s. 6d.

BEFORE anyone may act as a paid flying instructor in this country he must first satisfy the Air Ministry as to his competence to instruct, and must have his Pilot's "B" licence endorsed accordingly. As evidence of competency the Ministry accepts a certificate which is issued, after practical and theoretical examination of the candidate, by the Guild of Air Pilots and Air Navigators, an organisation representative of British commercial pilots and their professional interests. Three different types of Guild Instructor's certificates are now available, for landplanes, seaplanes and gyroplanes, and a set form of instruction in each of the three types of aircraft has been devised by the Guild's Panel of Experts so that pupils throughout the Empire will all be taught to fly by the most up-to-date method and in the same standardised sequence which experience has shown to be the best.

This booklet, issued by the Guild for the guidance of prospective candidates for Instructor's Certificates, describes in detail the recommended forms of instruction, the sequence in which it should be given, and the "patter," or verbal explanation, that should accompany it. The instructional sequences for landplanes, autogiros and blind flying are given in full, while for seaplanes, whose handling technique varies according to type, there is a list of recommended text-books. Also included in this handbook are the general conditions attaching to the issue of Instructor's Certificates, copies of the forms which have to be completed and the syllabuses of the tests which the prospective instructor must pass.

For the general reader, the interest of the book lies in the informative instructional sequences which comprise a complete written course of flying training from the preliminary description of the controls to the first solo flight, and include the gist of all the verbal instructions that a pupil receives from his teacher in the air—other than the less polite interjections which distinguish practice from theory.

TALES OF THE EARLY BIRDS

"Airdays": By John F. Leeming: Harrap: 7s. 6d.

JOHN LEEMING is one of the pioneers of gliding and sports flying in Great Britain, and, in this book of reminiscences, he draws a lively picture of the difficulties that "early birds" like himself had to face in their efforts to encourage the development of a country fit to fly over. It was a slow and disheartening business, but nothing quenched their optimism, and the author has many amusing stories to tell of those early days when flying was still a novelty and pilots who flew for fun were regarded as far from harmless lunatics.

His adventures did not lack thrills, and he gives graphic accounts of a forced landing on a busy main road, of finding himself flying upside-down with a broken safety-belt, of landing on the summit of Helvellyn, and of flying over a quarry at the moment of blasting.

Many well-known names figure in the author's reminiscences, and he writes in an easy, pleasant style that makes agreeable reading. For Lancashire readers in particular the revealing accounts of the early days of the Lancashire Aero Club, the battle to put Manchester on the air map, and the gallant struggle for existence of Northern Air Lines, in all of which he played a leading part, will make this book of special interest.

THE CONQUEST OF THE AIR

"Aerial Wonders of Our Time": In Two Volumes: Edited by Sir John Hammerton: Waverley Book Company.

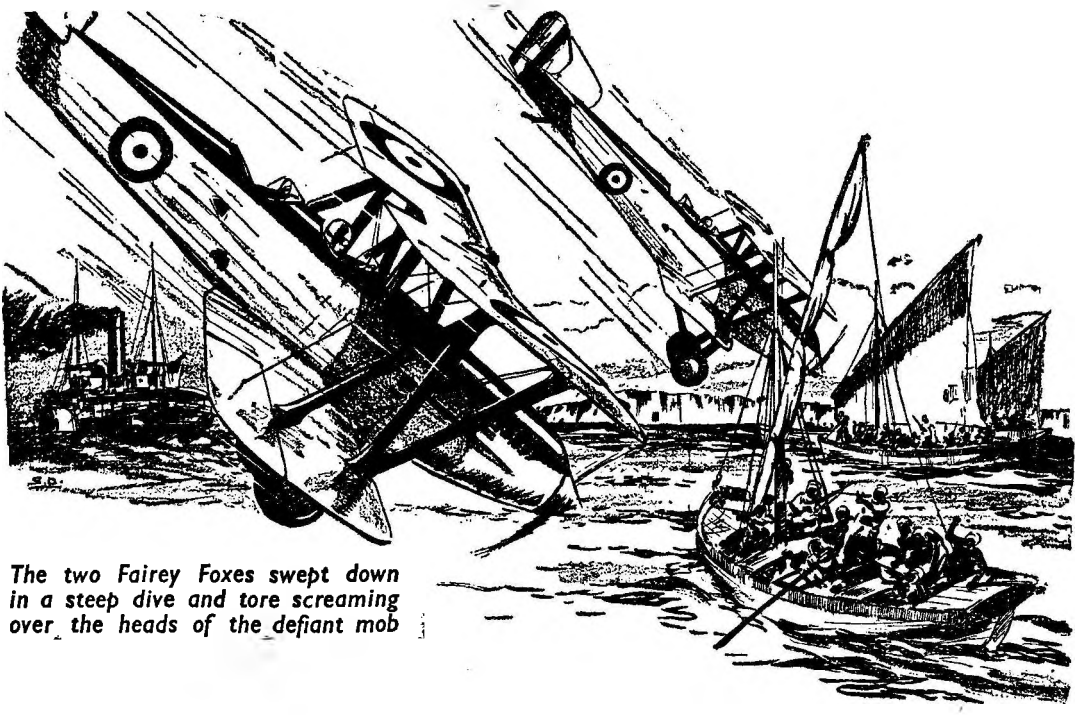
THIS imposing work, published in two attractively bound volumes, is described as "A Pictured Story of Flying, Past, Present and Future." It is a fitting description, for there are few aspects of aviation with which it does not deal in the course of its 804 large-sized pages and its 1,300 striking photographic illustrations. The chief contributors include such notable experts as Sir Alan Cobham, Lieutenant-Colonel J. T. C. Moore-Brabazon, Major Oliver Stewart, Sir Alliott Verdon-Roe, Boyd Cable and Major C. C. Turner, authority enough for the accuracy and interest of the historical sections, which trace the eventful and stirring story of man's conquest of the air from the pioneer days of 1903 up to the modern marvels of present-day military aviation. The period of the Great War is particularly well covered and the large number of historically interesting photographs, many of them from the Imperial War Museum records, probably represent the largest and certainly the finest collection of actual war-air photographs ever gathered together in one book.

The layout of the work follows no particular system of chronology or division, but a detailed index to both text and illustrations adds greatly to the value of the volumes as a work of reference. But it is, perhaps, as the most interesting and complete pictorial record yet produced of man's conquest of the air that "Aerial Wonders" will have its widest and most irresistible appeal.

BOOKS RECEIVED

Reviews of the following new aviation books will appear next month :—

"Ride on The Wind": By Francis Chichester: Hamish Hamilton: 10s. 6d.
"Contraband": By Dennis Wheatley: Hutchinson & Co.: 7s. 6d.
"War over England": By L. E. O. Charlton: Longmans, Green: 12s. 6d.



The two Fairey Foxes swept down in a steep dive and tore screaming over the heads of the defiant mob

SPECIAL DUTY

A Topical Story of Air Action Against Arab Rioters in Palestine, the World's Latest Trouble Centre

By J. H. STAFFORD

WHEN Flying Officer Lister of 216 Squadron, stationed in Egypt, heard the news that his old friend, Flying Officer Boyle, was to join him on special duty at the Headquarters of the British Section of the Palestine Police at Jaffa, his ordinarily happy countenance was wreathed in beatific smiles.

Now, standing before the canvas hangar, he watched the Fairey side-slip easily in to land in the confined space of the Macabee Sports Field, which, owing to its proximity to the police barracks, had been commandeered as an aerodrome.

"Boil, Old Boy!" Lister welcomed his friend with the familiar nickname.

"Blister, you Old Crab!" Boyle returned the greeting.

Since the day they had come together and some wit in the mess had christened them Boil and Blister, Limited, the corruption of names had stuck.

Now, as he led the way across the road to the hotel in which the flying personnel were accommodated, Lister explained in brief sentences the cause and progress of the Arab riots which had brought them to this lovely watering-place on the eastern shores of the Mediterranean.

Entering the hotel, Boyle's thirsty gaze fell on the loaded tray of a passing waiter. Meaningly, he licked his lips and eyed his friend.

"Come now, Blister, welcome your brother with the right spirit," he said.

"You'll get none of the right spirit

here," replied Lister. "It's mostly German."

Boyle shrugged with the slight impatience of one accepting the inevitable.

"Well, even a bad drink is better than a good thirst," he remarked philosophically. "Come on, don't let's trifle with the serious things ; let us taste what joys life has to offer."

"Yes, with the fifty piastres I lent you before I left."

"Impossible, brother, I lost it on the exchange."

"Exchange ? "

"Yes, the exchange of drinks with a bloke I met in Cairo."

TWO hours later, in the office of Colonel Barrington, Lister and Boyle faced their temporary C.O. To Boyle he looked like an ancient broody hen with a big moustache, a weary attitude, a sleepy voice and the keenest eyes he had ever seen ; eyes which pierced to the very core, and were quick to measure a man.

"Had any experience of this country?" The penetrating eyes rested on Boyle.

"Yes, sir, I was with 14 Squadron at Amman for twelve months."

"Good. Speak Arabic, or any other local language ? "

"No, sir, only English, er—and Air Force."

The faintest shadow of amusement flickered in the quiet depths of the Colonel's eyes. Turning to Lister, he enquired : "And what is the extent of your linguistic achievements ? "

"French, sir."

"And English and Air Force, I suppose ? "

"Mostly Air Force," Boyle answered for his friend, and smiled at the other's scowl. Colonel Barrington ignored the flippant remark ; his quiet tone assumed a seriousness which compelled the attention of the two pilots.

"Somewhere between this office and Air Headquarters, Ramleh, there has been a leakage of information concerning convoy movements, with the result that convoys escorted by armoured-cars arrive unmolested, while unescorted convoys are invariably ambushed by strong forces of Arabs. This ambushing has got to be stamped out before anything really serious occurs. That is the duty for which you two men have been chosen. You will hold yourselves in readiness for immediate action. You may go now ! Find Captain Harvey ; he will give you any help you need."

Outside in the dazzling sunshine Boyle pushed back the flying topee which he still wore.

"So this is the thrilling, hair-raising, breath-taking situation you have lured me into ! I'm to sit around waiting for orders to escort convoys. And to think that I left Albert shaking Blushing Maidens at the cocktail-bar of Shepheard's Hotel just for this ! "

"Oh, forget about Albert and his cocktails."

"I can't. He's got your fifty piastres."

"Wait till the fun starts, you'll forget quickly enough. Come and see the armoury."

As their eyes became accustomed to the comparative darkness inside the long low building, Boyle felt rather than saw a native watching him intently from behind a chained rifle-rack. He nudged Lister.

"Who's that bird ? "

"That's Ali—been here about ten years, I believe. He's a cleaner and works in here under Corporal Symes—he's all right."

Boyle approached the native, staring hard at the black fathomless eyes, the loose shirt and sexless trousers.

"Weren't you at Amman ? " he asked. The native slowly shook his head.

"No, Sahib—me here always," he replied.

Again Boyle searched the black depths of those eyes.

"Funny," he remarked. "Must have been somebody remarkably like you."

The native shrugged in the expressive, baffling way of a native confronted with something he did not understand.

"Me no him, Sahib," he said, and turned away to his task.

IT was during his second dive on the target next day that Boyle noticed the altered tone of his guns. The chattering rhythm changed suddenly to a clanking vibration. Suspecting a gun fault, he waved to Lister and nosed his machine for the 'drome.

Ten minutes later the two pilots were staring, fascinated, at a small, clean hole punched neatly through the aluminium blade of Boyle's propeller.

"What do you make of that?" Boyle asked.

"Moth," Lister replied as he fingered the hole. "I expect the whole thing is worm-eaten." Then, noting his friend's concern, he added, "Or maybe the gun-timing has gone."

"Timing nothing; it was set and tested a few days ago, and was in perfect order when I left Heliopolis. Except for reloading with ammo., it hasn't been touched."

"Perhaps there's something wrong with the ammo. then."

Boyle, however, scorned the suggestion.

"It's the same as yours, so we can count that out. Of course, it may have been one delayed round—though that's hardly likely. Anyhow, if we strip and inspect the gun and change the ammo. it ought to cure things."

"Mr. Blister."

Lister swung round to face an orderly and there was a distinct trace of indignation in his voice as he demanded:

"Who?"

"Flying Officer Blister, sir. The Colonel's compliments, and——"

"Just a minute; *Lister* is the name. Now, what is it?"

In obvious confusion the orderly stammered his apologies.

"I thought Corporal Jacobs said Blister, sir. The Colonel would like to see you immediately, sir."

Lister dismissed the man with a curt suggestion of a salute, and, followed by the grinning Boyle, made his way to the Colonel's office.

Despite his dreamy accent, Colonel Barrington wasted no words on formality.

"There is a disturbance on the water-front," he said. "Natives trying to board a cargo steamer. Take your machines and investigate; troops will arrive there shortly after you. You will only fire in defence, or if circumstances call for action. Just scare 'em."

IT was apparent to the two pilots, as they passed over Jaffa docks, that the Colonel had underestimated the situation. About a dozen open-decked boats, loaded with natives, were surrounding and attempting to close in on a small cargo steamer, which was heading for the open sea and safety. Crouched in the scuppers could be seen the crew, firing with pistols and rifles at the horde of screaming, gesticulating madmen in the smaller craft.

With a whoop of sheer joy from the pilots, the two Fairey Foxes swept down in a steep dive, shaved the heads of the cowering Arabs and clawed swiftly up to a thousand feet. Knives, stones and spars were hurled up at the machines in futile rage, as each tore screaming over the heads of the defiant mob.

When a shattering blow shook Lister's machine, and an invisible claw wrenched a bite out of his inner port strut he felt the time had arrived for more drastic action. Taking a sight alongside a boat-load of yelling maniacs, he cut a line of spray with his fire.

It was at the peak of his third climb that the Fox shuddered as a great metal blade tore clean through its port planes. With a noise like ten thousand empty tins in a hurricane, the engine raced madly. Frenziedly Lister struggled to hold his machine steady as he cut the switches, and in the stunning, nerve-shattering silence that followed he realised that he was hopelessly out of control.

With a few hundred feet between himself and a calm sea dotted with boat-loads of screaming fanatics, a "dead" engine, one prop.-blade completely missing, and his port aileron flapping like a broken wing, Lister glanced about helplessly for his comrade.

Lister himself had but the vaguest recollection of what followed. Like a wounded duck, his machine pancaked with a terrific splash into the sea. He

jumped, and as he rose to the surface a deafening roar and the vicious chattering of synchronised guns told of Boyle's activity. Behind him, the crippled Fairey floated deeply on the still heaving billows. He clung desperately to the slowly sinking 'plane, and watched with grim satisfaction the havoc wrought by Boyle's guns as a boat approached too near the wreck.

Tearing through the blue sea, bows lifted high above the stern, two fast motor-launches raced to the rapidly settling Fox, their mounted machine-guns blazing a deathly trail. Then eager hands gripped Lister's drill tunic as the tail unit of his machine disappeared beneath the waves, and brown, brawny arms lifted him over the gunwale of the launch like a bundle of sodden rags.

A CHANGE of clothes and a stiff "livener" did much to aid Lister's recovery. Beyond a ducking and the loss of his machine, he had escaped unscathed from his unnerving experience.

But, beside Boyle's discovery, the ordeal of the morning sank into insignificance.

"Blister, my Old Crab, cast your watery eyes over those—and tell me what you see."

Lister took the handful of cartridges held out to him.

".303, mark VII., red label stuff," he opined.

His eye caught the faint indentations on the bullet, and he whistled. Carefully he scrutinised the barely perceptible scratches with which each bullet was scarred.

"You mean ?"

"Yes. That ammo. was prepared for us. It's been doped or deadened in some way ; that's how you lost your prop.-blade. Can't you see ? If these cartridges were doped, the shots would be delayed by hang-fire, each a little later than the previous one until the bullets would cut into the prop."

In the deserted armoury, Boyle proved the startling truth of his suspicions. From the charge of the doped cartridges part of the macaroni-like threads of cordite had been removed, and the steel-jacketed bullets carefully replaced.

Lister gasped at the subtle, laborious ingenuity of the trick. He turned as Corporal Symes entered.

"Where's that Arab of yours ?" he demanded.

"He's in his quarters, sir," replied the Corporal. Then, noting the exchange of glances between the two pilots, he asked, "Anything wrong, sir ?"

"Yes, very much so," answered Boyle. "You'd better come with us and help sort this out."

As they left the armoury Boyle turned to Lister : "Lucky we're not both playing hide and seek with the mermaids," and, as an afterthought, he added : "Still, I'm glad it was you who got a ducking, because this is your best tunic I'm wearing."

"I thought I recognised the superior cut," was Lister's unruffled reply.

COLONEL BARRINGTON'S gaze lifted suddenly from the little heaps of cordite to rest questioningly on Boyle.

"And what makes you think the native, Ali, is behind this ?" he asked.

"Because he is so much like a native who disappeared suddenly from Amman camp, sir. I'd swear it's the same man."

Abruptly, as though he had decided a doubtful point, the Colonel's easy voice spoke a trifle less dreamily :

"Corporal Symes, bring Ali-Ben-Hussien, or, if you cannot find him, bring any tool which he is likely to have used." Turning to Captain Harvey, he continued, "Get me the native labour records, Mr. Harvey."

Of the five people present, Colonel Barrington was the least surprised when Corporal Symes returned with the report that Ali had not been seen since the morning.

With the leisurely concentration of a jeweller examining a precious stone, he studied with the aid of a reading-glass, the spanner which Corporal Symes gingerly handed to him, pausing now and then to compare the finger-prints with the official finger-print record which is

imprinted against the photograph of every native employee.

There was an even more intense gleam in his eyes as he met the set stare of each man in turn.

"As alike as two peas," he murmured. "Except for the finger-prints."

Boyle started forward eagerly.

"You mean, sir, that that Arab was not Ali?"

"That's precisely what I do mean. He was most probably a spy, and he *must be caught.*" There was a slow emphasis on the last words which sent a meaning glance flashing between the two pilots. That there was more to follow neither doubted; an impression which was immediately confirmed by the Colonel's next words.

"A troop-train left Akaba this morning and is due to arrive here to-night. Somewhere along that line there will probably be an Arab ambush waiting. One of those Arabs is the man who so nearly caused your deaths." He paused, and in the strained silence that followed his quiet voice sounded like the far-away echo of menacing drums.

"You understand me, gentlemen—that train must be warned at all costs."

"We understand, sir." Boyle spoke with the enthusiasm of a schoolboy.

"Oh, perfectly," Lister added, in a tone which he felt dispelled all doubt.

FLYING easily, steadily, the Fairey Fox followed the tortuous twists of the rails as they wended their way into the Judean Hills. With strained, aching eyes the two officers searched the long straight tracks where the lines crossed dried-up mud flats to the foot of a hill, when prudence bade them rise to safety.

It was over the barren, sandy bed of a sea which once lay between Ras-Hish and Hebron that Boyle, in the rear cockpit, pointed excitedly down to three natives who were staring up at them from beside the tracks. Banking sharply, Lister glided down to within fifty feet of the startled Arabs.

Three rifles spat a sudden volley at the machine as it passed overhead.

In his second dive Lister opened fire, and felt a grim satisfaction as two shrouded forms crumpled to the sand. He circled round searching for the third man, and was mystified to see no trace of a dark, fleeing figure.

Twice they circled the still forms beneath them before risking a landing, but their caution was unnecessary. No ambush awaited them as they clambered from their machine, but a few moments later Boyle whistled in surprise as he turned over the bodies of the two natives.

"Our chum—the gentleman known as Ali," he remarked. "Dead as a—— why, gosh, look at his shoulder." He paused to gaze in fascinated horror at the shattered mass of still bleeding pulp.

Lister glanced at the torn and mangled flesh, and turned away.

"They asked for it," he muttered. "Anyway, where's the other Johnny, and what were they doing?"

Boyle tore his eyes away from that awful sight.

"Yes, that's right, there were three of them. As for the job they were doing, I'll lay an even fiver they were planting a mine or a bomb."

Glancing at his watch Lister started.

"The troops will be along any minute now. Where is this bomb, or whatever it is?"

Completely recovered from his first shock, Boyle answered rapidly.

"Never mind that now, I'll find it; you carry on and warn the troops. I'll stay here in case that other fellow comes back."

Overwhelming his friend's protest with his urgent appeal for haste, Boyle clung to the wing-tip as the Fox was swung round to meet a freshening wind.

SCARCELY ten minutes had passed since Lister waved to the lonely figure standing between the rails when he sighted the hazy cloud of smoke above the long dark caterpillar of the train.

Flying the length of the train, he frantically motioned his message of warning, only to receive a cheery wave in reply. Again he sped swiftly along, level with the carriages, again he lifted and dropped his arm in rapid gestures.

The carriage windows were now blocked with khaki-clad figures, each waving a friendly welcome. A topee dropped off and bowled happily along the track.

Lister realised that his signals were being misunderstood. Hastily scribbling the words, "*Track mined—Stop*," he feverishly crammed the slip in a streamer.

With his wheels almost kissing the carriage roofs, Lister waited, and as the huge oil-tank tender of the engine came under him, he dropped his message practically onto the upturned face of the driver.

Ahead, minute white puffs and an intuition of his friend's danger urged him to return.

As he reached the spot where they had landed Lister took in the position at a glance. Crouched between the rails, shielded by the two dead Arabs, Boyle was desperately trying to hold off a creeping circle of attacking Arabs who were slowly and stealthily closing in.

The circle broke as he tore screaming over their heads, and there was a mad scramble for the knot of waiting camels a short distance away. They were too late. With the thunderous roar of a full throttle, Lister dived on the startled animals. Lashing and kicking in a frenzy of terror, they fled towards the horizon in a frantic stampede.

Fifty yards from the scene the troop-train halted, disgorging a stream of yelling khaki savages. Good English rifles spat with the rapid accuracy of a well-trained battalion, and Boyle burrowed deeper into the sand as the bullets hummed and whistled over his head.

The fight finished as suddenly as it had begun. Outnumbered, hopelessly outclassed and completely cut off, the remaining Arabs surrendered their arms sullenly to the triumphant and still laughing troops.

Shaken, but unhurt, Boyle grasped his friend's hand warmly.

"Thanks, Blister, Old Crab." The deep emotion of perfect understanding gripped them both.

Lister gave his friend an affectionate punch. "Rot, man, that show of yours was worth a medal," he declared fervently.

"It was worth two medals," Boyle replied seriously.

With a return of his usual light-hearted banter, Lister added generously, "Boil, Old Boy, forget all about that fifty piastres you owe me."

"That's all right, Blister, Old Crab—I have."

FEW people found anything startling in the published report that "*A Palestine troop-train was saved from disaster by a machine of the R.A.F.*" Fewer still realised the thrilling incidents that lay behind that barren statement. The Royal Navy is not Britain's only Silent Service.

But in the comparative peace of normal routine at Middle East two young flying officers toasted the achievement. It is possible that, in such a moment of jubilation, one repaid the fifty piastres which he had borrowed from the other.

It is possible. It is far more probable that he borrowed another fifty.

THE STORY BEHIND THE COVER

Major W. G. Barker's Famous Christmas Day Raid on the Austrian Front

THIS month's striking cover painting by S. R. Drigin depicts the novel form of Christmas greeting which the R.F.C. once delivered to the Austrian Flying Corps during the Great War. The occasion was the Christmas of 1917, and the originator of the "warm welcome" was Capt. W. G. Barker, later to win the V.C. for his gallantry on the Western Front.

Starting off in the early hours of Christmas Day Barker and two companions from No. 28 Squadron, all flying Sopwith Camels, launched a lightning attack on the Austrian aerodrome at Motta, some twenty-five miles from Istrana. Diving down on the snow-covered field from a great height they laid their "eggs" and then proceeded systematically to shoot-up barracks, hangars and all aircraft in sight. Their ammunition exhausted they zoomed up and away, and, as a parting gift, Barker dropped overboard a placard bearing the seasonable inscription :

"*To the Austrian Flying Corps, from the British R.F.C., wishing you a Merry Christmas.*"

No official report of the damage done in this raid was ever issued but it is believed that a Gotha and a scout were both completely destroyed, a fire started in a hangar and some sixteen men killed and wounded.

Next day the Austrians decided to return the compliment and their gratification at destroying two R.E.8.'s and three Italian Hanriots was only slightly tempered by their subsequent discovery that the object of their attentions had not, after all been No. 28 Squadron's aerodrome.

A MILITARY GYROPLANE

By
JAMES HAY
STEVENS

A Description of the Avro "Rota," with Complete Instructions for Building a Solid Scale Model

THE "Rota" is the official title bestowed upon the military version of the standard Cierva Autogiro Type C.30 but, without divulging any State secret, it may be mentioned that the only real differences between the "military version" and the standard civil Type C.30 are its colour scheme and a few items of special equipment. The "Rota" is unarmed and is intended for Staff Communication purposes, not for the ordinary offensive Army Co-operation work. The Autogiro's low minimum flying speed and its ability to land in, or take-off from restricted spaces give it marked advantages over the conventional aeroplane for this work, and render it ideally suited for transporting officers and delivering messages, as well as watching and reporting upon the movement of supporting troops and thereby assisting in the control of traffic.

The principle of the Autogiro is well known, and only the briefest re-capitulation need be given here. It should be remembered that an Autogiro is *not* a helicopter, as it is so often miscalled. The vanes of the rotor are aerofoils and revolve freely, not under power, while those of a helicopter are power driven and attempt to screw their way into the air. The rotor of an Autogiro is started by means of a driving shaft from the engine while the machine is on the ground; but, once it is air-borne, this drive is "de-clutched" and the rotor revolves freely, being kept in rotation by the action of the air on the blades.

The blades of the rotor are hinged to give them a limited vertical movement and also a backward one. If they were rigid they would soon collapse under the effects of aerodynamic and centrifugal loads. When in normal flight the blades rotate at 180 to 200 r.p.m. Naturally, due to the speed of the aircraft, the forward-moving blade has a higher air speed, and therefore a greater lift, than the backward-moving one. The hinged rotor blades allow the forward-moving blade to rise and absorb this extra lift. The resultant "lift" of the rotor is not quite vertical, and to counteract this the rotor pylon is mounted at a slight angle. The different air speeds of the forward and backward movement of

each blade during the course of one revolution impose large variations of drag load, and these variations are absorbed by the vertical hinges, which are fitted with special friction dampers. The Type C.30 Autogiro has the "direct" system of control in which all manœuvres in the air are made by tilting the rotor pylon. Turns are made by banking only, no rudder being required.

The "Rota" is built by the Avro Company, and has certain structural points of resemblance to their aeroplanes. The rotor blades consist of steel tube spars with wooden ribs and plywood covering. As with all plywood-covered structures on British aircraft, there is an outer covering of fabric. The blades are hinged to the rotor hub so that they are free to move, over limited angles, in the vertical and horizontal planes. Circular friction dampers, mounted over the hinges, restrict the horizontal movement of the blades. The hub is mounted on top of the pylon so that it can be inclined fore and aft, or to either side by means of a "hanging-stick." The movement is damped and limited by springs. A driving shaft from the engine serves to give the rotor its initial rotation and an internally-expanding brake is employed for stopping the blades. The rotor pylon is a straightforward structure of four round steel tubes with deep balsa wood fairings.

No Rudder and a Hanging Joy-Stick

THE fuselage has a main structure of welded steel tubes and is rectangular in cross-section. Light wooden formers and stringers are used in order to obtain a rounded shape. The covering is of fabric. The two cockpits are perfectly normal with parachute seats and equipment is conventional, except that the usual joy-stick is replaced by a stick hanging down into the cockpit from the rotor. Although there is no rudder, the tailskid is steerable, and for this purpose there is a foot-bar in each cockpit.

The engine is an Armstrong-Siddeley Civet seven-cylinder air-cooled radial of 140 h.p., and is mounted with a very pronounced downward thrust. The standard Armstrong-Siddeley exhaust collector ring is fitted; but there is no cowling on the engine. Petrol is carried in a 23-gallon tank in the fuselage in front of the fire-proof bulkhead.

The tail unit is rather interesting. The long low fin is necessary in order to give clearance to the rotor blades. The framework of the fin is welded steel tube, and it is integral with the fuselage. The small tab at the rear is adjustable for directional trim—it is not a rudder. The tail-plane with its upward-swept tips is especially interesting. The camber is not symmetrical—it is like a wing section, one surface is flat, the other cambered—and in order to offset the effect of engine torque the *upper surface of the starboard side and the lower surface of the port side* are cambered. By this means the tail-plane tends to roll the aircraft to port, thereby counteracting the torque reaction of the engine which tends to roll it to starboard. Trimming tabs are let into the trailing-edge of the tail-plane. All tail surfaces are fabric covered.

The undercarriage is very strong and has a very long travel. The shock-absorbing units consist of two Avro oleo-spring compression legs with Palmer wheels and low pressure tyres. Bendix brakes are used. The tail-wheel is also a Palmer wheel, and is carried in a special Dowty fork and compression strut. A specially strong tail-wheel unit is needed owing to the unusual take-off and landing of the direct-control autogiro wherein this wheel is the last to leave and the first to return to earth.

The following data apply to the Rota fitted with the Civet engine:

Tare weight	1,220 lbs.
Fuel and oil	209 lbs.
Useful load	371 lbs.
Max. permissible weight	1,800 lbs.
Max. speed	110 m.p.h.
Cruising speed	95 m.p.h.
Minimum flying speed	15–20 m.p.h.
Initial rate of climb	700 ft./min.
Service ceiling	12,000 ft.
Range (still air)	285 miles

HOW TO BUILD THE SCALE MODEL

Details of Tools, Materials, Construction and Assembly

THIS model is simple to make, the amount of material required is small, and the time required for construction is not great. One or two parts, notably the engine and the undercarriage, require a fairly delicate touch, but apart from this it is a straightforward model. In accordance with the practice followed in connection with previous models in the series, a $\frac{1}{72}$nd scale has been chosen for the drawings and all dimensions for materials and parts of the model are given to suit this scale. Conversion to any other scale more suitable to some individual taste is a simple matter.

Materials and Tools

MATERIALS required for this model are :—a block of wood $3 \times \frac{5}{8} \times \frac{1}{2}$ in. from which to carve the fuselage ; a sheet of fibre for the rotor blades and horizontal portion of the tail-plane, measuring $6 \times 6 \times \frac{1}{16}$ in. ; a piece 6×6 in. of fibre $\frac{1}{32}$nd in. thick or of 22-gauge sheet aluminium for the tips of the tail-plane and the vertical fin. The rotor pylon struts are best made from 22-gauge aluminium sheet—if it is decided to use aluminium for the fin there will be enough for the struts in the piece already quoted. Some 18 in. of 22-gauge brass wire will be needed for the undercarriage.

The engine permits of several methods of construction, and details of the materials will be given when it is described. Wheels and airscrew may be purchased from almost any model store, or from toy or sports shops. It is certainly advisable to purchase the wheels, as the low pressure type is difficult to model without the aid of a lathe.

The following tools constitute the essential minimum :—a $\frac{1}{4}$-in. chisel, small plane, penknife, oil-stone, small long-nosed pliers, small half-round file, $\frac{1}{16}$-in. bradawl, fretsaw, plastic wood, a tube of cellulose glue and a penny ruler measuring $\frac{1}{10}$ths, $\frac{1}{12}$ths and $\frac{1}{16}$ths of an inch. Soldering can be employed with great advantage on this model, and anyone capable of tackling ordinary wireless soldering should include a soldering kit among his model-making tools. An elaborate kit is not needed, principally an iron (with not too small a bolt), a stick of solder and some liquid flux, such as "Baker's Fluid," all of which are obtainable from an ironmonger's or a tool shop.

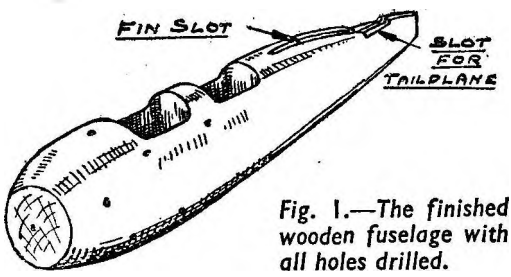


Fig. 1.—The finished wooden fuselage with all holes drilled.

Method of Construction

HAVING thoroughly read and understood the instructions, assembled the tools and purchased the materials, work should begin with the making of a tracing of the side elevation of the fuselage. When making this tracing the engine and the tail fins should be omitted. Place the tracing on the fuselage block and pin-prick the outline. Remove the tracing, line-in the outline with a pencil and cut away the surplus wood. Draw a centre-line on the upper and lower faces of the resulting block and mark in the plan of the fuselage. With a fretsaw cut a slot $\frac{1}{32}$nd in. in width very carefully along the centre-line of the fuselage from the tail to a point $\frac{1}{4}$ in. from the back of the rear cockpit. This slot is to take the sheet of fibre for the fin and, having cut it, work may be resumed on the fuselage and more surplus wood removed. The next step is to round the fuselage to its correct section. Cut out the cockpit openings and drill the holes for the various struts. With the fretsaw cut a horizontal slot in the rear of the fuselage to take the tail-plane.

Cut the rotor blades from the sheet of $\frac{1}{16}$-in. fibre and give them a bi-convex camber with file and glasspaper. The simplest form of rotor head to which

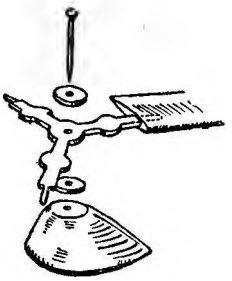


Fig. 2.—Details of the rotor hub arranged in order of assembly.

the blades can be attached is made from sheet brass or aluminium. The arrangement is shown in Fig. 2. If the fibre is sufficiently protected with paint it should not be affected by damp or heat unless it comes in contact with it in excessive quantities—damp swells, and heat shrinks unprotected fibre, while they both tend to warp it. The pylon head is made from a block of wood and, after shaping, it has to be drilled to take the rotor pin, engine drive, the ends of the four struts and control stick. The pylon struts are made from sheet aluminium. The drive from the engine is a plain piece of wire. The control-stick is best made from two pieces of wire, soldered together and faired with paper, as shown in Fig. 3.

The fin is marked out by tracing the

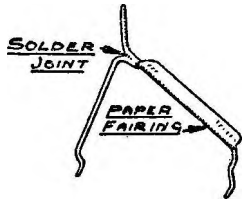
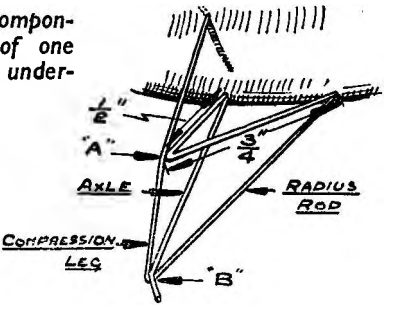


Fig. 3.—The connected "hanging stick."

General Arrangement Drawing and pin pricking—it is best to streamline it after glueing in place. The thicker fibre tail-plane is cut out and cambered—*on the top surface of the right-hand side and the under surface of the left-hand side.* The turned-up tips are glued on after assembly. The "vee"-shaped struts are made from wire.

The undercarriage units are made from brass wire, and the method is shown in Fig. 4. The joint "A" may

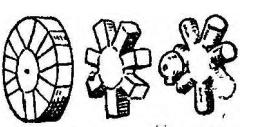
Fig. 4.—Component parts of one side of the undercarriage.



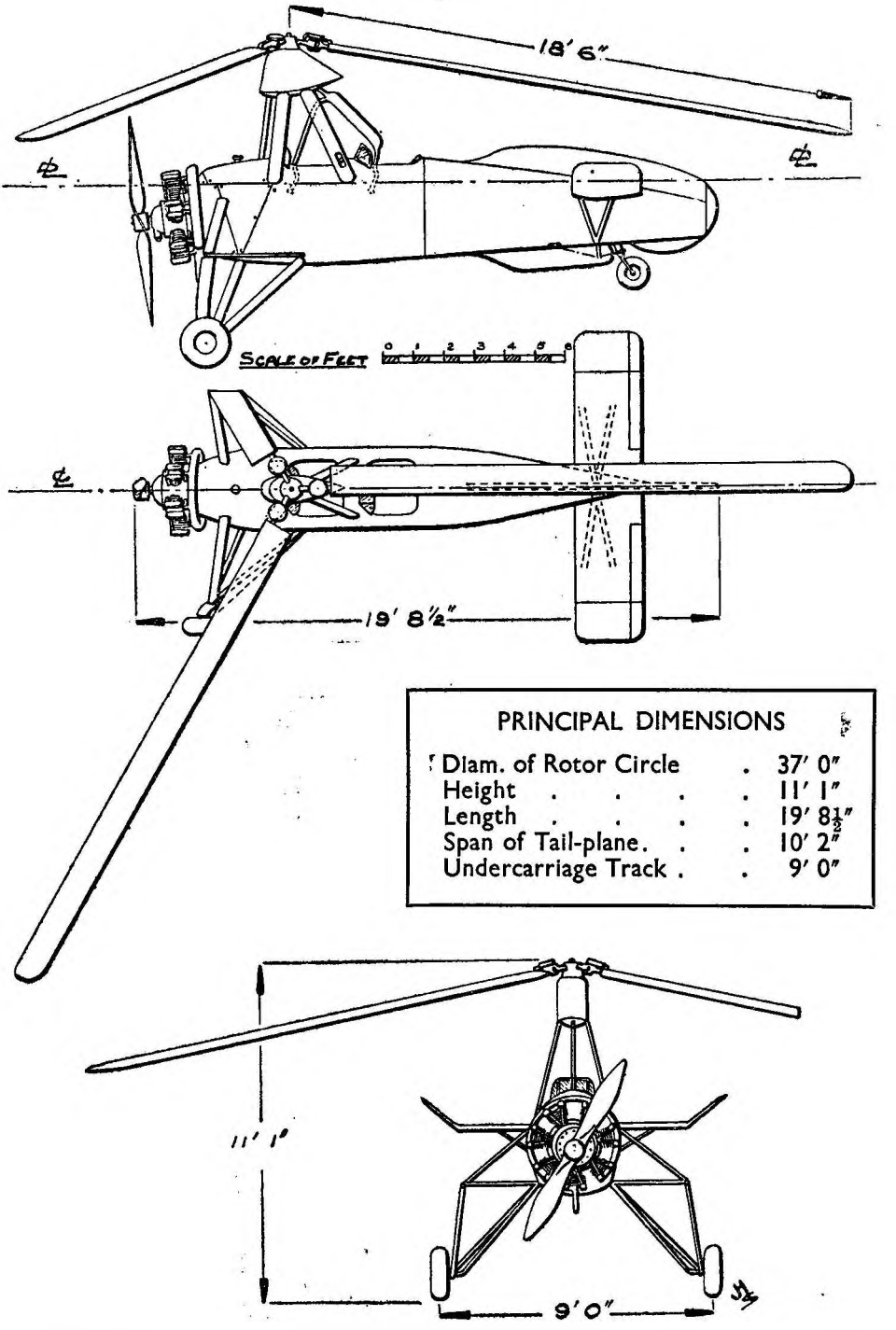
be made by turning a tiny loop with pliers, but it is far better to solder it. The best way to adjust the undercarriage is to make the horizontal "vee"-shaped structure and fit it to the fuselage; the dead lengths of the struts are given in Fig. 4. Fit the long wire from the top of the fuselage to the apex of the "vee," from there to the axle and back to the bottom of the fuselage in one piece—this wire represents both the compression leg and the radius rod. A very long pin makes the best axle and should be neatly soldered to the bottom of the undercarriage "vee" (Fig. 4—"B"). The various struts may be faired with paper when the undercarriage has been assembled.

The engine is the most difficult, or at any rate the trickiest, part to make. Two of the best and easiest methods are shown in Figs. 5 and 6. Fig. 5 shows the way to cut out and shape a disc of wood for crankcase and cylinders, using another piece of wood for the front part of the crankcase. A more effective metal engine is shown in Fig. 6. This is not as terrifying as it looks. The crankcase is filed from a piece of brass rod (usually obtainable from any good toolshop, garage or smithy) of about $\frac{1}{4}$ in. diameter. $\frac{3}{32}$ in. holes are drilled to take the cylinders, which are made from 6 B.A. brass bolts; their inner ends have to be filed down slightly in order to make them fit the holes. The cylinders can be secured with a touch of solder, and details, such as the valve gear, can

Fig. 5.—Three stages in the construction of a wooden engine.



THE AVRO "ROTA" COMMUNICATIONS 'PLANE



PRINCIPAL DIMENSIONS	
Diam. of Rotor Circle	37' 0"
Height	11' 1"
Length	19' 8½"
Span of Tail-plane	10' 2"
Undercarriage Track	9' 0"

A General Arrangement Drawing showing Three-view Plans and Dimensions of the Military Autogiro

Fig. 6.—The crankcase of the metal engine is filed from a brass rod and the cylinders are small brass bolts.

be made from wire and soldered in place. A few more tools than are mentioned in the list will be needed to make this engine ; but the actual construction is simple. The airscrew is carved from a piece of wood in a similar way to the fuselage.

Method of Assembly

GLUE the fibre fin into its slot, camber it and fair it with plastic wood. Slip the tail-plane into its slot and fix its two " vee "-struts. Fit the tail wheel in place with a wire fork.

Mount the wooden pylon head on its struts and glue the whole in place. Do not forget the engine drive, for it will be tricky to fit later. The windscreens are made from celluloid and should be glued in place immediately prior to fitting the pylon.

Next fit the undercarriage units, adjust them for track and alignment and glue them in place. Add the rotor unit, with its washers, to the top of the pylon and glue the stick in place. Glue on the turned-up tips of the tail-plane. Glue the engine to the nose and pin the airscrew into place.

Painting and Colour Scheme

The Rota is painted entirely silver. R.A.F. cockades are carried on each side of the fuselage, and on top of it between the rear cockpit and the fin. The machine number is borne on the sides of the fuselage. The engine is black. The airscrew is silver with the backs of the blades painted black.

Any good quality paints or enamels will do for painting the model—oil paint is easier to handle than quick-drying cellulose. No. 5 sable, or camel's hair brushes are about the best. Apply the paint thinly and evenly and allow it to dry thoroughly before attempting to put on another coat. Two or three coats of silver should give the model a good finish, provided the parts were originally well smoothed with glasspaper.

(NEXT MONTH: The Short N. 2B. Flying-boat.)

HERE'S THE ANSWER

Replies to Readers' Enquiries

PTERODACTYL FIGHTERS (R. S. Lea, Falmouth, Cornwall). No R.A.F. squadrons are as yet equipped with Westland-Hill Pterodactyl Fighters, as this machine is regarded as being still in the experimental stage so far as military aviation is concerned.

R.F.C. STRENGTH (L. O. Parks, Edinburgh). (1) On the outbreak of the Great War the total personnel of the R.F.C. and R.N.A.S. amounted to 197 officers and 1,647 other ranks. On the date of the Armistice the strength of the R.A.F. was 30,122 officers and 263,410 other ranks. (2) R.F.C. and R.N.A.S. strength in August, 1914, was 272 aeroplanes and seaplanes, and 7 airships, compared with 22,647 aeroplanes and seaplanes, and 103 airships, in November, 1918.

TAIL MARKINGS (W. E. Smith, Plaistow, E.13). (1) The national colour markings formerly seen on the rudders of R.A.F. machines were abolished for aerodynamical reasons. With modern high-speed aircraft, in which all control surfaces are delicately balanced, it was found that the extra weight of paint and its usually irregular surface, was apt to unbalance the controls and involve serious risk of accident. It was, therefore, decided that no control surface, whether rudder, aileron or elevator, should in future have any paint on it other than the ordinary waterproof dope.

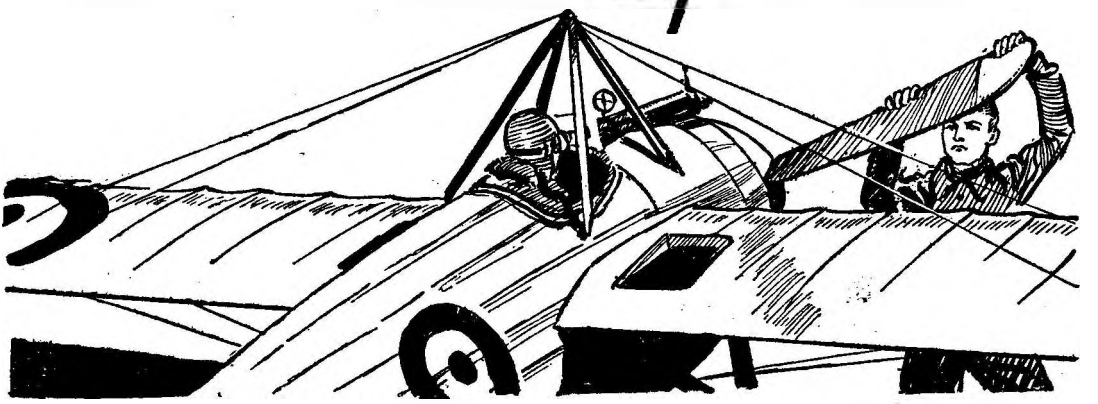
RADIO BEARINGS (Harold Jones, Blackpool). The bearing which you recently heard given by radio to an aircraft in flight was in degrees not in metres. Most probably it came from the Manchester Airport station and was the magnetic reciprocal bearing of the aircraft in relation to the Airport, enabling the pilot to check the accuracy of the course on which he was flying.

McCUDDEN, V.C. (S. Crabb, London, S.E.25). Major J. B. McCudden, V.C., was buried in the Airmen's Section of Wavans Cemetery in France.

S.E.5 (B. Josling, Brentwood, Essex). (1) Yes, the S.E.5 did use a four-bladed propeller. (2) Here are the victory scores of the airmen you list : Garros, 5 ; Cicelet, 2 ; Madon, 41 ; Coppens, 34 ; Putnam, 11 ; Lufbery, 17 ; Rickenbacker, 26. Hpt. Brandenburg was the C.O. of No. 3 Bomber Squadron and had no official victory score.

LOOPING AN AUTOGIRO (Miss S. Bowman, Southport). Yes, an autogiro has been looped, but we have never heard of it doing a full roll and rather imagine that such a manœuvre would be impossible with this machine. Why roll an autogiro, anyway ?

CONTACT *by the* EDITOR



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WITH this issue AIR STORIES, born in 1935, enters upon its third year of publication, and the occasion is a fitting one upon which to express our thanks to the host of good friends to whose constant interest and support the magazine owes its present success. In particular, we are grateful to those readers who have helped us by their letters of praise or criticism, and by suggestions for new features or the improvement of existing ones. These letters come from all parts of the British Empire and play an important part in maintaining the standard of AIR STORIES by helping us to gauge the preferences of readers and to meet new requirements.

In the coming year we hope that we shall not only keep these old and valued friends, but that we shall also hear from many new ones. Whether they write in praise or in criticism their views will be equally valuable—and just as welcome. For the rest, we shall continue to flatter ourselves that their absence of comment indicates satisfaction with the magazine as it is and confidence in our continued endeavour to make each issue of Britain's only air magazine of fact and fiction a little bit better than the last.

The Last War or the Next?

TYPICAL of the kind of letter that we welcome as a frank expression of opinion is the following, recently received from Mr. F. Royston-Mather of Leeds:

"I am a regular reader of AIR STORIES," he writes, "and would like to tell you what I think of it. In the first place, it is a fine magazine, but has, I think, too much war-time fiction. Most people nowadays who are at all interested in aviation know the types of machines and methods of fighting employed during the War, and all such stories are bound to be much the same. After all, the aeroplanes of the Great War do not really concern the present generation, which will have flying bullets and not 100 m.p.h. relics to contend with.

"I think it would be a better idea to print more articles about modern military 'planes—your new series of diagrammatic sketches is on the right lines—and descriptions in fairly simple language of the working of such modern devices as the motor-cannon.

"To me, 'Here's the Answer' is one of the most interesting parts of the magazine, and I always read that and 'Contact' before anything else. I hope I have put my views clearly and, in conclusion, would add this final point: keep the magazine entirely British in style and it will never go far wrong with the British youth of to-day, which is much more patriotic than Mussolini seems to think when he refers to us as 'a declining nation' and 'a country of old men with old ideas.'"

No one is likely to dispute the sentiments of the last paragraph of this letter, but how many, we wonder, will agree that there is little interest or advantage in recalling those heroic days of the Great War in the Air? What tales of a future war in the air could ever, for example, carry the conviction of an air story of the World War which, fiction though it might be, was based on fact and written by a man who had actually lived and played his part in the stirring times of which he writes? We may be wrong—and we invite opinions on the view expressed in this letter—but we imagine that stories of the War in the

CHRISTMAS, 1936
To all readers of AIR STORIES we offer the Compliments of the Season and our Best Wishes for Blue Skies and No Forced Landings in the New Year.
The Editor and Staff of "AIR STORIES"

Air are one feature of which the great majority of AIR STORIES' readers will never tire.

"The Eagle of the Ægean"

THAT there are ex-Service readers who appreciate such stories for the memories they revive is evident from the following most interesting letter sent to us by Mr. W. H. Johnson, a former chief mechanic of "C" Flight, No. 17 Squadron, R.F.C., who writes :

"I am a very enthusiastic reader of AIR STORIES, and have been waiting for someone to remember that the R.F.C. also served in Macedonia during the War. A. H. Pritchard in his recent article, 'Eagle of the Ægean,' has given myself and others of 17 and 47 Squadrons a real treat. No. 17 Squadron, from Egypt, was the first R.F.C. unit in Macedonia, and I well remember the kite-balloon episode when Von Eschwege was blown to pieces.

"'C' Flight had been shelled out of Orljak and had taken over the 'drome at Lahana which was 2,500 feet above sea level. I was inspecting an engine in a hangar at the time and the concussion blew the canvas in and knocked me off the ladder I was standing on. I remember, too, that Captain K. Greene, O.C. Scout Flight, was away on leave in England when it happened, but returned soon afterwards with some new S.E.5a's with which finally to settle with the Count. He was furious when he learnt that the Count had been brought down a few days earlier.

"Nos. 17 and 47 Squadrons were then equipped with B.E.2c's, 2d's, 2e's and 12's, and we had to make upright gun-mountings for the pilots as 'Jerry' flew at about 22,000 and the only way we could reach him was from underneath. Captain Greene accounted for a good number that way. Then came A.W.'s, the Gun Bus and, at the last, D.H.9's. One day, too, a flight of R.N.A.S. Sopwiths came to assist in the bombing, but we didn't see much of them because, whilst the last machine was being loaded up the next morning, a bomb exploded and the whole lot went up ! Fortunately, most of the men had already left the hangar.

"I should also like to see an account of the 1916 Darfur Expedition, as I was one of five mechanics at Gebel-el-billa, from where Captain Ballantyne flew the longest service flight then on record—7½ hours on a B.E.2c. It was on this front, too, that Captain, now Wing Commander, Slesser was wounded in the thigh—he already had one gammy leg—and flew home holding the rudder cables. He won the M.C.

"Enough of this, I could go on for ever ! And if my reminiscences have bored you, lay the blame on your intensely interesting magazine, which has rekindled memories for which I am grateful."

To which our reply is that we only wish many more of our ex-Service readers would "bore" us with reminiscences of similarly great interest and historic value.

Readers who have enjoyed Mr. Edward Green's fine story in this issue, "Evidence from the Skies," will be interested to know that, like most of the fiction in this magazine, his story is founded on fact. In a covering note attached to the story, Mr. Green states :

"Though the Fisheries Patrol story is fiction, it is taken from an actual happening which was chiefly responsible for the formation of the present Air Arm of the Fisheries Patrol now operated by Canadian Airways. These aeroplanes patrol the fishing areas, and keep such a strict eye on all boats that they have put the poachers completely out of business. They carry aerial cameras with which to substantiate any prosecutions brought for fishing in prohibited areas, and such photographs have repeatedly proved invaluable in maritime courts."

Another Richthofen Controversy Settled

IN our November issue we published a letter from a reader, Miss Patricia Hancock, who possessed a photograph of von Richthofen taken immediately after his death, but who doubted its authenticity because of the apparent bullet holes near the nose. We have received a number of letters on the subject expressing widely divergent opinions, but, fortunately, AIR STORIES' "Official Historian," Mr. A. H. Pritchard, is able to settle the argument and explain the mystery of the "bullet holes" :

"Miss Hancock's photograph of Richthofen," he writes, "is quite authentic, and I happen to have a print from the same negative. She has, however, been misinformed regarding the bullet-holes, as the marks to which she refers are, in reality, injuries caused to Richthofen's face by impact with the dashboard when his machine crashed on its last flight. Some of these injuries, particularly those under the nose and chin, might easily be taken for bullet-holes by those unfamiliar with the appearance of such wounds."

So that's that, and the threat of another Richthofen controversy is nipped in the bud.

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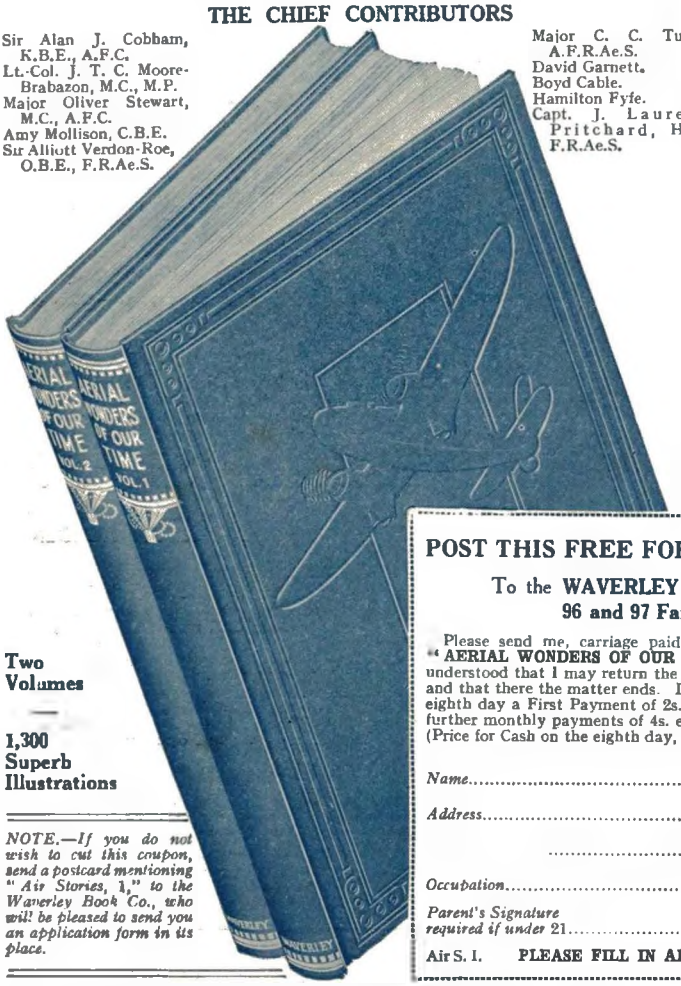

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