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INDIVIDUALITY

In the imagination of the world, of the future, the history of the period through which we are passing will occupy a great space. The children's children's children of the present generation will, in the days to come, be taught to look back to the time in which we are living as the days in which the great happenings began from which a new world and new civilisation had their origin on this planet.

The children will read of the gradual development of Prussian military power. They will read that for more than a quarter of a century, the Kaiser and his satellites had in mind "Der Tag." They will learn how insidiously the military and naval leaders of Prussia strived and worked to attain world wide power. They will understand that when the memorable clouds of war burst and the world was thrown into chaos, science had made vast strides. Then they will examine circumstances further. They will learn of the claims our enemy has put forward of intellectual superiority and will ponder over the wonderful and deadly engines of war evolved by the scientific minds of the nation which assumed for itself the name of "the nation of the scientists." The fact that this nation's remarkably rapid development in aircraft occurred after the never to be forgotten August of 1914 will come to mind. That the submarine was little more than in the experimental stage before that date will also occur to them.

Then they will think of a gun specially devised to throw missiles of death a distance of 75 miles. They will have other food for thought too, but it will all tend to the same end, that the greatest scientific development was accomplished by the scientist of the nation which advanced such claim, with the idea of destroying human life. They will say "truly it is remarkable how a nation which claimed for itself intellectual superiority, and advanced that as a reason for desiring world wide power, could utilise the efforts of its best brains in so terribly an objective."

They will be interested still further and continue the examination. They will delve further into history. They will learn of the vast preparations for war made by the Prussian autocrats of Germany. They will then find out that France, though unprepared, managed to mobilise her army sufficiently to offer resistance to the German hordes that devastated Belgium and, that equally unprepared, Great Britain ranged herself on the side of right against might and the allied forces were then able to offer strenuous resistance. They will then learn the forces of this nation which claimed such striking superiority "trooped off to the firing line in their millions, happy and singing," as one writer of to-day remarked. They will learn that the millions were opposed to forces which could be counted in thousands, yet the weaker held the stronger in

check. They will then learn that though the war raged for years, and other nations joined in the conflict in the interests of civilisation, the numerically stronger and "more intellectual" forces failed to accomplish the mission the leaders intended. Again the examiners of the present day happenings will marvel.

They will no doubt pursue the matter further. They will remember firstly that although all the devilish devices scientific achievements allowed were resorted to, and secondly overwhelming superiority in numbers failed to give this "intellectual and superior" race victory. Again they will wonder and then consider causes and reasons, but it will only be the psychologist that will be able to explain the apparent mystery. He will understand as we to-day can understand when reviewing events of the last month, of the little thought of factor that dominates all. The scientist may work and devise such things as we of to-day know of on the sea, on the land and in the air, the inventor may produce the wonders that we acclaim as marvellous inventions, the leaders of men can possess

wonderful powers of forethought and accomplishment, but all their efforts go for naught, unless those whom the scientist and the inventor hopes to benefit, and the leaders desire to succeed, possess the factor of individuality and realise personal responsibility.

That is the only deduction possible to arrive at now, as in the time of the third and fourth generation. And never can it be more strikingly exemplified than it has been during the last month. The allied forces on the western front enjoy the benefit of scientific advancement and inventive genius to as great an extent as the enemy, on land, on the sea and in the air, and have always done so. But, the great factor after all, is that the soldiers from the private up to the General, and sailors from the humblest to the admiral, fighting in the Allied cause, possess individuality, and consequently assumes responsibility. This is what the psychologist of the next century must understand, else he would indeed be at loss to solve many things when he interests himself in events of to-day.

∴ YOU ∴

*If the word of our Lord as it's written is true,
In millions of bibles for all and for you,
If the word of our Lord as it's written is true,
Then what do you think of the creature called YOU?*

It's so easy to doubt, it's so simple to pray,
When there's no reply to the prayers, that you say
If you'd just hear a tick or a tap in the wall
You'd think perhaps someone had heard your call.
But the tick doesn't come, nor the tap don't relieve
The phantom of doubt, so you just must believe,
Just lie in the dark and into space stare,
And hope, if you can, that He hears you out there.
I've a thought in my mind that has made me believe;
I will tell it to you—it may make you believe
The words that you don't understand—that you've
read;
Just suppose for a moment, my friend, that you're
dead.

What do you think of it now that you're dead,
And six feet of earth is piled high on your head,
And a mantle of dampness is all 'round you there,
And a box of rough wood is all meets your stare?
Just suppose that the soul that you never quite found
Doesn't leave your cold clay when you're put in the
ground,
And you know you're boxed and they fast the last
screw,
That you've nothing to do but to think the thing
through.

What do you think of those words roughly said,
Heaped in cold scorn on somebody's head?
What do you think of that underhand deed,
Which caused so much anguish and made those
hearts bleed?

What do you think of those dollars you got,
That brought you soft beds and left victims a cot?
Man's law could not reach you, the way it was
read;

But what do you think of it now that you're dead?
What do you think of that wild, startled look,
Which spreads o'er the face of the girl you forsook?
And the words that you spoke when she started to
cry—

Would you speak them again if your tongue were
not dry?

What do you think of that job you obtained
Through the twist of a fact, and a co-worker
blamed?

Much power it brought to you—to others distress,
And now that you're dead, do you call it success?
What do you think of it now that you're bound
In a little black suit way down in the ground,
And endless eternity drifts o'er your head—
What do you think of it now that you're dead?

*If the word of our Lord as it's written is true,
In millions of bibles for all and for you,
If the word of our Lord as it's written is true,
Then what do you think of the creature called YOU?*

FROM THE MIDST OF THEIR ARMY

(By C. A. JEFFRIES)

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The man who ordered the burning of the Belgian City of Louvain was Major General von Forestier. One can quite imagine that the Belgians wanted von Forestier very badly indeed. All the wealthy Belgians were not in Belgium when the German hordes rolled in; and in quite a little while von Forestier was a haunted man. There was a price on his head on proof of death. There was a bigger reward still for the man who would deliver him alive into the hands of the Belgian troops around Dunquerque. Roughly, the reward on the delivery of von Forestier, alive and cursing, into the hands of the Belgian army stood at about £10,000. None of this sum, be it mentioned, was offered by the Belgian Government, but was all guaranteed by wealthy Belgians whose treasure was not in Belgium.

The German High Command, ever solicitous about its most thorough criminals, shifted von Forestier east, and for a while he served on the Polish front. But in this war the Germans were very thorough. Certain officers had made a study for years of certain districts in Belgium and France and Poland and Russia, and everywhere else where German troops might be employed. Von Forestier had made a five years study of Louvain and its surrounding country, and after a brief respite on the eastern front, he was transferred back to the district he knew, regardless of the consequences to his own hide.

There is a certain type of scouting aeroplane used by the Anglo-French forces that does not make the infernal aerial riot we usually associate with flying craft. It is not noiseless, but it has certain advantages which may not be particularised here. Flight Lieutenant H. J. was to make an excursion into Belgium on one of that type this particular night, with a view to ascertaining in what direction the German troops were concentrating. At 2 a.m., the full moon would be flooding the land with mellow light, and the Flight Lieutenant would be able to get a clear view of what was happening. This was necessary, for the Germans were trying to play off on the western front what Hindenburg had so successfully put up on the Russians in East Prussia. Every morning General Rennenkampf used to send his giant Ilya Mourametz aeroplanes to see what Hindenburg was doing. Hindenburg em-

ployed an entire army corps for the purposes of camouflage. All day they marched on foot towards Rennenkampf's right wing; and the Russian prepared for assault in that quarter. All night those marching troops went back by motor lorry or any other means, and did it all over again next day for the benefit of the Russian aerial scouts. And when the attack did come it was on the other flank, with troops that had been concentrated by railway at nights. It was a successful ruse, but there was small hope of playing it on the British and French, with their night flyers. This will explain the nature of the work on which the Flight Lieutenant was engaged.

Night flying is always dangerous; but it is tenfold so when the air is full of planes scouting round without lights, seeking to bomb and machine-gun billets and hutments, and gather information. Many brave young lives have ended in the crash of colliding aeroplanes.

The scout climbed to 10,000 feet and dived across the German lines, between the search lights and star rockets. In his comparatively quiet machine he could hear the sullen "crump-crump" of the shells falling in the German lines. Then, suddenly, just beneath him he saw a barrage laid down, and guessed that some raiding work was afoot, to worry the German nerves. Then the roar of the guns and the crump-crump of the shells droned down and died in the distance. The moon climbed up into the sky, and the seeking plane slowed down to the lowest possible speed, and the scout began to seek for signs of moving troops.

The land of Belgium was strangely quiet and beautiful in that mellow light. As far as appearances went it was a sleeping land where there was no sign of war and brutality, and any inexperienced person sitting in that plane would have thought he was sailing over Elysium.

Suddenly the moon was blotted out. A cold, clammy moisture struck the scout's cheeks. He was in utter darkness, and the luminous faces of his instruments looked ghostly in the clammy darkness, the darkness that could be felt. His compass oscillated wildly. A sudden flash of lightning almost blinded him, and then a terrific rush

of burning wind accompanied by a deafening, ear-splitting roar dazed him. He knew what it was. He had charged right into the centre of a thunder cloud. In the rush of contending currents his plane was tossed about like a cork on a raging ocean. Then a corporsant (St. Elmo's light), fastened to the centre of his propeller, and streamed like a banner of light through the whirling blades, making it impossible to see anything but its unearthly glare.

It seemed hours, but, as a matter of fact was only seconds, and then he fell out of the thunder cloud and was once more in the calm, beautiful moonlight. The corporsant had gone, and the aviator saw with horror that the moon was beneath him, and above him was a great mass that looked like a large sized hamlet, which seemed to be falling down upon him at headlong speed.

The sweat broke out on him as he altered the angle of his planes, and seemed to drop towards the moon, and the village in the sky went whirling past but stopped falling towards him. Then he righted himself, and the moon was once more over his head and the earth beneath his feet. The explanation was, of course, that in the thunder cloud he had turned right over and when he emerged from the cloud was flying upside down.

And down below him the roads were full of moving troops. Shots began to bang and crash. Shells burst around him, but he swooped lower still, and then rifle fire blazed out. There were long lines of moving lorries, and all the roads were filled with sinuous lines that wriggled like great snakes—marching men. Oh for a squadron of battle-planes!

He shot away across country where there were no roads, only fields, with houses dotted here and there. Then more roads filled with marching troops and more shrapnel bursting around him. More searchlights stabbed through the misty moonlight and caught him momentarily. The time had come to get out. The moonlight was growing dimmer every moment; a fog was creeping over the whole land. He climbed 2,000 feet and found it thicker. He climbed another 2,000 feet and then the moon shone clear and glorious, but the earth had gone and below him was a fairy land of gold and silver clouds, with here and there rainbows.

As far as he could visualise that floor of rolling cloud was unbroken. His position was serious, for the moon was going down, and presently he would be in darkness with a blanket of impenetrable fog between him

and the earth. And, another thing, he knew he was lost. Even if he could descend he dared not, as he might come down in the middle of an enemy army.

He rushed southward at headlong speed, seeking an opening in the rolling clouds below, and, at long last, found it. A long spiral dive, with one eye fixed on his aneroid he climbed down that narrowing funnel in the mist. Then, seen dimly as through a veil, a wide field with a poplar lined hedge. He flattened out, made a perfect landing, shut off every gleam of light, and waited, listening intently, nervously.

Only the multitudinous noises of the night sounded from hedge and tree. He reached for his thermos flask and wrapped himself a bit warmer, and lay back. He felt himself grow drowsy, but knew the one thing he must not do was go to sleep. The fog had closed right down, and was so thick he could not see twenty feet ahead. In spite of himself he drowsed, till suddenly he heard a bugle sound. It was answered by another, and then another in the distance. In a moment he was wide awake, alert. Those were German patrol bugles, signalling "all well!" But what profoundly affected him was that he realised he was right in the centre of the charmed circle they were guarding. He had landed in the middle of a pretty nest of hornets. Well, there was nothing for it but to await the daylight, and make a dash for it.

The fog grew whiter and whiter. The daylight was coming. He drained the last of the hot coffee from his thermos flask and prepared for instant flight. Then suddenly he froze. The air was filled with a sudden clatter and roar; the noise of battleplanes, big ones, too. They passed right overhead, high up, and he knew they were circling round. Were they after him? No, they could no more see him than he could see them.

They were descending. There was a burst of machine gun fire. Those planes had landed; and the clatter of machine guns was mingled with the crackle of rifles; German curses and glorious English oaths tore through the mist. Then it grew suddenly light, for a gust of wind shook the veil of fog, and out of it appeared a German officer in pyjamas, running for his life. He saw the aeroplane and stopped; the scout shot him on sight.

The wind ripped the fog into ribbons that waved languidly; and through the openings the scout gazed on a weird scene. He had landed in the very centre of a depression,

and on the swelling crest of the rim of the saucer was a white cottage with a red roof and green shutters. The scout knew he was in Flanders. Four great battleplanes bearing the colors of England were on the smooth lawn in front of it. Two tall men hurried towards him, and stared with amazement at him and his machine, then they seized the wounded German.

"Say, mate, if you're von Forestier you're coming with us. If you ain't that cow, you can stay here and be buried nicely by your own blankers. Let's see your flaming ear!"

The wounded German groaned as the Australian turned him over and examined his left ear.

"You are not von Forestier; so you can slip: You seem to be done for anyhow."

Bugles were ringing out; a long whistle came from the nearest aeroplane, which bore down on them, and suddenly left the ground. The two who had examined the dying German raced for their machines, and got on board. They circled and rose, and the scout rose with them, and saw for the first time that every aeroplane had a German tied and strapped on to the fuselage.

The battleplanes turned south west, and the scout followed them. They signalled him to make faster speed and keep low. They were still driving through scattered masses of mist and by the time they reached 500 feet, the fog was still thick beneath them.

Pandemonium was raging beneath them. Shots were coming from all quarters; and looking round the scout saw a covey of Germans in pursuit. In front the fog was breaking right up, and through the rents and rifts he saw glimpses of the German lines. The battleplanes in front swooped; they were going to pass just over the heads of the Germans and bluff them they were German machines from an aerodrome just at the back; the aerodrome, in fact, the pursuers had risen from.

They flashed over the German lines at 150 miles an hour; and as they soared over their no man's land, the German guns spoke. One great battleplane swerved, staggered, but lifted herself and flew on; rolling heavily.

"Hard hit!" said the scout as he ducked his head to the sound of an explosion near by, and his own plane rocked ominously. Then the British guns spoke; the trenches were left, and in a few minutes the sunlight sent the mist shivering away in tender spirals and threads of silver, and below was an Australian aerodrome, in which the first battleplane was just making a landing.

They gave him a royal welcome and insisted upon him staying to breakfast, while leading him to the telegraph office so that he could report his whereabouts. This done he was rushed to the breakfast table, and after gulping down some boiling hot tea, he inquired what was the caper they had engaged in.

"It was this way," said the tall Australian he had first seen and who was evidently in charge of the raid. "The Belgians want that cow Forestier, the blanker that fired Louvain, you know. Some wealthy Belgian johnnies offered a thousand quid for him, dead or alive, but they gave a bonus for him alive. Another five hundred thick uns."

"And did you get him?" inquired the scout.

"Bet your adjective life. He's outside now, and three others with him. We want that £1,500 for the Belgian kiddies' orphanage. Hope the swine doesn't die before we hand him over. That damned shell that hit the 'plane took his leg off just below the knee."

"Shot their own general, eh!"

"Yes; won't they be mad when we let them know. Wonder if they'll court-martial the bloke that fired the shell. That would be a joke."

There was silence for a moment and then the scout remarked, it was a deed of some pumpkins to rip a general out of the midst of his army.

"Yes," said the big Australian dreamily, "it was all right once we got the swine aboard. The archies were afraid to fire for fear of hurting them, otherwise not one of us would have got back. We'll never get another chance like that, though. Have some more duck, old man!"

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Five Airmen, who, as they were drafted from various parts of the world, suggest Rudyard Kipling's immortal lines in his poem "The Parting of the Columns."

GOOD-BYE, YOU BLOOMIN' ATLASSES! YOU'VE TAUGHT US SOMETHING NEW.

THE WORLD'S NO BIGGER THAN A KRAAL. GOOD-BYE-, GOOD LUCK TO YOU.



ORDERS HAVE ARRIVED FOR DEPARTURE FOR THE FRONT.

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AT HOME IN ONE OF THE HUTS.



THE FIVE ATLASES AGAIN.



THE LABOUR (NATIVE) CORPS ON THE DECK OF A TRANSPORT.



THE DOCTOR AT WORK VACCINATING THE MEN OF THE LABOUR CORPS.



THE TURKS LEFT SEVERAL TRUCKS INTACT AND THE AIRMEN PROMPTLY SECURED ONE TO SERVE AS HOME.



A "CATERPILLAR" TRACTOR HAULING STORES. OWING TO THE NATURE OF THE COUNTRY, CARTS WERE USELESS.



A MORE COMFORTABLE TYPE OF HOME.



THE AERODROME AT ——— SEVERAL MACHINES ARE LINED UP READY FOR A FLIGHT.



HEADQUARTERS OF THE AUSTRALIAN CAMEL CORPS AT ——— MOUNTED ON THESE CAMELS. THE AUSTRALIANS HAVE PERFORMED WONDERFUL WORK.



A "FORCED" LANDING FAR DISTANT FROM AN AERODROME. THE ENGINE HAD TO BE TAKEN OUT ON THE HILLSIDE.



THE RESULT OF AN ERROR IN JUDGMENT. THE MACHINE LANDED ON ITS "NOSE."



THE PILOT OF THIS MACHINE PREFERS LANDING UPSIDE DOWN.



A LANDING IN "UNOFFICIAL" GROUND ATTRACTS ATTENTION, AS WILL BE NOTICED BY THE INTERESTED GROUP OF SPECTATORS.



A MONOPLANE—A VERY USEFUL TYPE OF MACHINE.



THE RESULT OF AN INCORRECT LANDING.



A BAD SMASH. THE ENGINE IS NOTICEABLE IN THE FOREGROUND AND COMPLETELY BROKEN OFF.

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ANOTHER BAD SMASH. FORTUNATELY THE OCCUPANTS OF THE MACHINE WERE UNINJURED.



A HUN MACHINE DESTROYED DURING A RAID ON THE ENEMY AERODROME.



UPSIDE DOWN IN MID AIR.



A TRAILER BRINGING IN A SMASHED MACHINE.



A STREET SCENE IN ONE OF THE VILLAGES THROUGH WHICH THE AUSTRALIANS PASSED.



ANOTHER VILLAGE SCENE. AUSTRALIAN GUM TREES ARE GROWING ON EACH SIDE OF THE STREET.



SCENE OF HEAVY FIGHTING. THE TURKS WERE STRONGLY ENTRENCHED ON THE DISTANT HILL.



VILLAGERS SELLING ORANGES, ALMONDS, FIGS, ETC., TO THE AUSTRALIANS.



RESULT OF AUSTRALIAN BOMBARDMENT. THE SCENE IS IN THE CENTRE OF A TOWN.



ONE OF THE MANY MOSQUES. A SHELL HAS FALLEN THROUGH THE ROOF.



ANOTHER BUILDING WHICH WAS A GOOD TARGET FOR THE ADVANCING FORCES.



NATIVES AT WORK DRAWING WATER FOR THE TROOPS.



RESULT OF A COLLISION. THE MACHINES MET HEAD ON AS THEY WERE GLIDING DOWN TO LAND.



THIS ILLUSTRATION WILL GIVE SOME IDEA OF THE APPEARANCE OF A TOWN, FROM A HEIGHT OF 3000 FT.

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A CAPTURED TURKISH LOCO AND TRUCK. THE TRUCK WAS ALSO USED AS A HOME.



AFTER REPORTING TO HEADQUARTERS, A "SPELL" IS MUCH APPRECIATED.



CAMEL WATER CARRIERS ATTACHED TO THE ROYAL FLYING CORPS.



A CAPTURED HUN HANGAR. ONE OF THE "DUG IN" HANGARS IS DISCERNIBLE IN THE DISTANCE.



A CAPTURED GERMAN HANGAR.



A SLIGHT SMASH.



A HUN ALBATROSS MACHINE, WHICH, DURING A FIGHT, CAUGHT FIRE WHEN SEVERAL THOUSAND FEET IN THE AIR.



A BRISTOL "FIGHTER" ATTACKED AND BROUGHT DOWN THE HUN MACHINE, WHICH WAS TOTALLY WRECKED.



TYPES OF HOUSES IN A BIG NATIVE TOWN.



A CAPTURED HUN AERODROME.



AN OBSERVATION POST OF THE ENEMY'S, WHICH MADE AN EXCELLENT TARGET DURING A BOMBARDMENT. THIS VIEW OF THE INTERIOR WILL TESTIFY TO THE ACCURACY OF THE GUNNERS.



THE FAMOUS BEERSHEBA RAILWAY STATION.



PLOUGHING WITH AN OLD WOODEN PLOUGH, FASHIONED OUT OF THE BRANCHES OF A TREE, AND TWO YOUNG BULLOCKS IN EXACTLY THE SAME WAY AS IT WAS DONE IN BIBLICAL TIMES.



ANOTHER INTERESTING SIGHT. AFTER THE AUSTRALIANS ADVANCED, MANY OF THE POPULATION RETURNED TO THEIR HOMES AND BEGAN TO PLANT THEIR CROPS.

The Nerves of the Army

By Lieut. Horace J. Firth,
A.I.F.

Special to "Sea, Land & Air"
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No more wonderful advance has been made in scientific knowledge since the commencement of the war than in the systems of communication between units of the army—the means by which "the right hand knoweth what the left doeth." The story of the rise of the Signal Service in the field will be, when fully written, one of the technical marvels of the age. Its work is quiet and unostentatious, but it must be unflinching. A fighting unit without its perfect signal organisation would be like a body with-

He will know at once and issue instructions for the reinforcement of the threatened position or for retirement, if necessary, to a position of greater security. Is the enemy weakening at any point? Again he will know and throw in his attack before there is time for his adversary to strengthen the line. It is as though one places his hand in a position of danger—near a fire, for instance. The information that the hand is being burnt is conveyed to the brain in a flash. Another infinitesimal fraction of time and



A COMPANY OF AUSTRALIAN SIGNALLERS ATTACHED TO THE LIGHT MOTOR WIRELESS SECTIONS.

out its nervous system—a mere lump of clay—blind, deaf, dumb, insentient and helpless. As the nervous system connects all parts of the human body to the controlling centre—the brain—so does the Signal Service link up the multitudinous sections of the army to each other and to General Headquarters—the brain of the army. General Headquarters is in constant touch with Army Headquarters and Army Headquarters with each other. Divisions, Brigades, Battalions, Companies, Platoons and even isolated units, all are connected one to the other and to the higher and lower formations, in order that news of any importance may be instantly conveyed to the nerve-centre. The Commander-in-Chief is thus enabled to take action at the crucial moment. Is a portion of the line in danger?

the brain has issued orders to the muscles to withdraw the hand, which is done before serious damage results. Similarly, in boxing, the eye sees a weak spot and telegraphs to the brain, which causes the hand to strike before the weakness can be remedied.

Some form of communication must be among the first to arrive in any new position and with the last to leave. The writer, who has been on active service with various signal units since August, 1914, first in German New Guinea and afterwards in Egypt, Gallipoli and France, had the good fortune to be at the landing at Anzac with a wireless section which was ashore and in action on the heels of the first attacking party. At the evacuation he was in charge of a signal section attached to a Brigade Headquarters, when his duty was to keep in touch with the

whole of the line until the moment when the trenches were evacuated by the last of the defenders, with whom his party retired. Two wonderful experiences which would take volumes to describe, but which are outside the scope of the present article, and are cited merely to illustrate the necessity for the immediate transmission of information to the nerve-centre or brain of the operations. At the landing it was essential for the director of the attack to know exactly what each unit was doing and how each was faring, and to be able to communicate speedily to unit commanders orders as to their dispositions. It was largely owing to a partial failure of the systems of communication that the venture was not completely

ing up of Allied reinforcements to the threatened areas, will serve to illustrate the difference in present conditions from those of the past.

As indicated in an article in the first number of "Sea, Land and Air," up to the beginning of the nineteenth century there was not even any method of communication between ships at sea, and the army had to rely on word of mouth or on written messages carried by aides-de-camp. The Signal Service of the present day practically had its birth in the Boer War, prior to which the only advance that had been made in this department from the use of mounted aides-de-camp as despatch riders was the employment of a few visual signallers (eight



MARCONI PACK STATIONS ON THE WAY TO THE FRONT.

successful, and it was only the perfect understanding and intercommunication between all sections of the army and navy which made the evacuation one of the world's most astonishing military feats.

From olden times up to the middle of the nineteenth century, an army consisted of a few thousand men—even Napoleon's great force never exceeded half a million—and a battle on a grand scale was a matter involving at the most some thousands on each side. The numbers were limited to what the Commander-in-Chief, with the assistance of his aides-de-camp, could keep under his personal supervision. Where simultaneous attacks by two or more armies were to be launched against an enemy, laborious preparations were necessary. Once started, an attack had perforce to follow the prearranged course, as it was usually impossible to divert an army separated by distance and lack of communication from its head, even though the venture might be proving to be a failure in other sectors. The lightning diversions of the German armies, in the great battle now raging, from the points of greater to those of lesser resistance, and the prompt bring-

per battalion then being considered sufficient), and a crude effort at establishing field sounders and cables for telegraphic work.

The wide areas covered by our armies in the South African campaign, and the distances separating them, made unity of command impossible without some means of connecting up isolated units. Then it was that visual signalling, with flags for short distances, and lamps and heliographs for longer ones, with the morse code as a means of intelligibility, came into more general use. The limits of these methods being well defined—even with the aid of powerful telescopes seven miles for flag signalling, twenty miles for lamp signalling, and seventy miles for heliographing under the most favourable conditions, are the outside distances attainable (though it is said that a phenomenal record of 176 miles was put up by heliograph during the Boer War)—the necessity for other means became apparent.

Necessity is ever the mother of invention, and the outcome of this particular need was the portable field telephone and the field telegraph. The first attempts at both were naturally far from perfect, as is the case

with all inventions in their embryonic state, but they served their purpose for the moment, and what is more important, showed their possibilities. At the conclusion of the South African war the whole question of the establishment of a Signal Service was considered by the British War Council in the light of the experience gained during that campaign. The immediate result of their investigations was the formation of a number of new units, who formed part of the engineer services, whose sole duty was to instal and maintain communications be-

advance or retirement—can be effected. The use of telegraphs and telephones alone in the present war, forms a huge portion of the work of the Signal Service, involving the employment of an army of telegraphists, telephonists, switch operators, line repairers and erectors, pioneers and a hundred other details.

Even so late as 1914 the importance of establishing a separate Signal Service had not impressed itself upon our military leaders. Until quite recently, as stated above, it formed a section of the Royal



WIRELESS MEN AT WORK IN THE TRENCHES.

tween the various parts of an army in action. So the Signal Engineers came into being. The next progressive step was the publication of a new "Training Manual of Signalling," which was intended to co-ordinate the training in, and practice of, signalling throughout the whole of the army. This manual is constantly undergoing revision, as the experiences gained on active service bring out new points of progress.

The field telegraphs and telephones have been developed to such an extent that a Divisional Signal Office at the front in the present war is more like a permanent city telephone and telegraph exchange than a mobile office, and it is almost incredible, even to the initiated, with what speed and lack of confusion an unpremeditated move—to keep pace with

Engineers and was under the jurisdiction of the Director of Engineers. In this, as in other matters, we were almost hopelessly outdistanced by the Hun, whose systems of intercommunication at the outset of the war were years ahead of our own. However, in our usual only-just-in-time British way of "getting there" in the end we have now organised on similar lines to those of the enemy, and have in some ways improved on his arrangements. The Signal Service is now under control of a Director of Signals, who is responsible for communications of every description throughout the whole of the army. His duty it is to see that no stone is left unturned to provide the highest degree of efficiency in the maintenance of communications. No move of any description is now ordered without consulta-

tion with "Signals" as to the possibilities of the various positions available, and his advice largely decides the venue. The Signal Officers throughout the army must be in constant close touch with their immediate commanders, and must receive early information of any projected move in order that such arrangements as can be made beforehand are ready, or plans for different contingencies may be worked out.

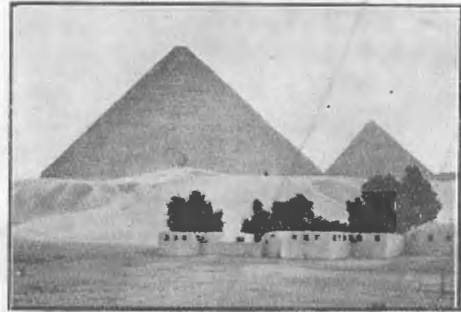
It is only in motion—in advance or retirement—that the signaller, like his brothers-in-arms, the infantryman and the gunner, is really "tried out." During the long periods of lull, when both sides are sitting back and building up their strength for another blow, his work is comparatively easy. On arriving at a new position, which is likely to be semi-permanent, he has to instal his communications, which are, at least as far as telegraph and telephone lines, exchanges and junction boxes are concerned, always laid out with an eye to possible permanency. Cables near the front line are buried deep enough to be safe from shell-fire; exchanges and junction boxes are built with the utmost solidity, and are usually underground. Plans and charts are carefully constructed of all lines, and suitable positions for visual, line, pigeon and wireless signalling, so that on a Division being relieved for the purpose of resting, the incoming Signal Officer will have no difficulty in taking over and carrying on without delay.

This is the playtime of warfare, enlivened only by little "stunts," such as raids, reconnaissances and gas alarms, during which the signaller settles down into a humdrum routine—going carefully over everything under his care, repairing and replacing where required, experimenting with new appliances, getting his full requirements of sleep and food, and generally preparing for the "crowded hour of glorious life" which he knows most certainly approaches.

Then, like a bolt from the blue, the storm-cloud bursts, and woe betide his unit if his preparations have been carelessly made, or if he is unable to fulfil the demands made upon his energy and his wit. It may be that he is called upon to extend his field of operations to keep pace with an advance, in which case his arrangements must be such that he is able to cover each yard of ground as it is taken, following up the front line with his system as though it were an elastic netting attached to the advancing party and being dragged forward with them. In case of retirement he must be ready to

withdraw in a similar manner, except that now he is contracting instead of expanding.

Sit back, reader, close your eyes for a moment, and try to imagine it. Think of yourself taking a house, furnishing it, installing light, water and telephone. Fancy a cruel landlord ejecting you, bag and baggage, and your having to take up your goods and walk. Picture yourself being compelled to move all your worldly goods to another house some distance away, and at the same time having to keep yourself in touch with supplies and telephone. Try to visualise the confusion, worse than Dante's conception of the Inferno, of hundreds or thousands of other people in the vicinity undergoing the same treatment. Add to this the most tremendous noise of which you can conceive. Double it. Double it again, and re-double—



A NOVEL USE FOR ONE OF THE PYRAMIDS. THE LARGER OF THE TWO IS USED AS A MAST FOR A WIRELESS STATION.

even then you will fall short of the reality. Recall the worst weather conditions you have ever experienced. Mix the ingredients together, and partake of the mixture carefully at first. An overdose is liable to be fatal. Now, having gradually become used to the conditions, try to think of yourself struggling to preserve ordinary everyday arrangements in the midst of all this mess. This is what the signaller must do. His organisation is like some huge octopus, whose tentacles may be advanced or withdrawn at will, and whose whole body may be moved if necessary.

Communications between Brigade Headquarters and higher formations are comparatively simple, and are usually kept up by means of telegraphy and telephony. Mounted and motor-cyclist despatch riders are also used to carry such messages as are too long for transmission by wire, or are of a secret nature. It is from Brigade Headquarters to the front line, when in action, that the many ramifications of the Signal Service are drawn upon to supply

those methods most suitable to the occasion. Here, owing to the tremendous nature of the artillery bombardments, it is usually found impossible to lay any sort of cable, for if laid they will be cut to fragments even as they are paid out. The writer has seen cable placed in position prior to an enemy barrage. After the firing ceased he has examined the place where the cable was, and been unable to find pieces of more than a few inches in length. Other means must, therefore, be used. Numerous "runners" (foot despatch carriers) are always

The birds are carried in baskets containing six, or in double baskets of twelve. In the basket is fitted a "Pigeon Service Message Book," composed of specially prepared forms printed on very light rice paper, known as "fimsy." The forms (as are all message forms) are made out with a view to the reduction of the number of words to be transmitted to the least possible consistent with clearness. On the back is a large scale map of the sector in which the operations are being carried out, which may be marked to indicate necessary positions,



A MESSAGE BEING RECEIVED ON A PORTABLE WIRELESS STATION IN A TRENCH.

available, but the human element is precious, and to be conserved, so mechanical means must be first tried. Visual methods are often possible, but depend entirely on the configuration of the ground and the position of the enemy. Pigeons are extensively used as message carriers, and have proved a huge success. They are bred in lofts some distance from the line, close to Divisional Headquarters, and the lofts are connected by wire to Headquarters.

The pigeons are carried forward to the line in baskets by men specially trained to deal with them, but on account of the difficulties attendant upon their transport to the front line the number available in any action is comparatively small. They are, therefore, only sparingly used to carry urgent messages.

and so further conduce to brevity of expression. The birds are fitted with clips to carry these message forms, which, when folded, occupy an extremely small space. The messages are written out in duplicate or triplicate, and two or three birds are released, each carrying a copy of the same message. This is to ensure that one, at least, will reach the addressee. In the case of an especially important message the methods of transmission will also be duplicated or triplicated, or more. The responsibility lies with the Signal Service. There must be no failure, and such is the present state of efficiency of the Signal Service that there rarely is any failure. But to return to methods. So little is known by the great G.P. about the use of pigeons in the present

"Big Noise" that a little elaboration of the subject may not be amiss at this juncture.

The effectiveness of this very ancient method of communication on the Western Front has been nothing short of amazing. It was thought at first that the tremendous noise and the concussion of the artillery fire would militate seriously against the pigeons getting through with their valuable freight, but the fact is that sound is conducted mainly along the surface of the earth, not being audible at any great height, and the bird on being released soon rises through the stratum of great concussion, quickly gets his bearings and flies straight, at a great height, for his destination, on arriving at which he dives almost perpendicularly to his loft. Owing to these considerations it has been found that a very large proportion of the pigeons gets through, and though, of course, numbers of birds are lost, the percentage of efficiency is very high.

The only really modern methods of inter-communication are by means of wireless and aircraft observation. Each, as used during the present struggle, forms a large subject, about which books could be written. As it is not proposed on this occasion to write even one book, a good deal must necessarily be omitted, but a general idea of the work carried out will be attempted.

The uses of wireless are many, and wireless itself is ubiquitous. Most people have some knowledge of it, but few understand its extent. It may be found in high-power stations for world communication, and in low-power portable sets for trench work. Between is a wide range of instruments of various types and powers, for use in all conceivable positions and emergencies, but it is with the sets used in action that this article is mainly concerned. These are constructed first with a view to effectiveness, and secondly with regard to lightness and portability. Speed of movement, as has been shown, is often of the first importance. A delay of seconds in "getting through" may mean all the difference between the success or failure of the manoeuvre of a whole army.

It is not permissible to discuss some of the apparatus in use on the Western front, details of which are a profound secret even to those whose duty it is to make use of it. It is issued under seal, which must be broken only in case of necessity—for repairs or adjustment—by the chosen few who know its construction. In no circumstances must the seal be broken by anybody in or near the line. If repairs are required, the

instrument must be returned to those responsible for its issue.

The ordinary $\frac{1}{2}$ K.W. trench set is familiar to all connected with signals. It is easily portable by three men, but has been found too cumbersome for the present trench war-



A MILITARY MOTOR WIRELESS STATION WITH THE BELGIAN ARMY.

fare on the French front. It will soon be obsolete, as it is being replaced by the more powerful, more reliable and more portable sets mentioned above. Like its forerunner, the field telegraph, the portable field wireless installation is subject to continual modification. New inventions are being evolved and tested daily. When found efficient they are immediately taken up by a War Department which is necessarily much more lively now than it was in pre-war days, and put into use almost before the inventor's brain has had time to cool after his labours.

The $\frac{1}{2}$ K.W. pack set, carried by four horses or mules, and the $1\frac{1}{2}$ K.W., $2\frac{1}{2}$ K.W. and 5 K.W. waggon and motor-car sets, which had been brought up to a high standard before the war by the Marconi Company, are extensively used, more particularly on the fronts on which great distances are covered in a short space of time, and where the communications have to keep pace with cavalry movements. The smaller sets transported by pack animals are employed over broken or hilly country, where motor traffic would be impossible. The latter is used over terrain which is negotiable by wheeled transport.

Australia has a number of these stations in the field in Palestine and Mesopotamia, manned entirely by Australians, trained in

Australia. Some of these are fitted out with sets of Australian manufacture, but this industry has not yet been fully developed here. Probably when it is fully realised that it can be done without our calling in assistance from outside there will be a growing tendency to place orders for "home-made" goods in this, as in other lines, and Australian wireless work and research will receive a much-needed impetus.

To return to the maintenance of our nervous system during movements at the front. A simple form of wireless, com-

laid plans have been frustrated. This, by the way, is one of the branches in which the Germans had a long lead in the earlier stages of the war. Bitter experience has taught us much, and we may now claim to be at least equal, if not superior, to them in this form of spying.

One of the most important amongst the means of keeping the brain of the army informed of the progress of a detached front line in an offensive movement is by what are called "contact patrol" aircraft. These are not fighting machines, and are only fitted for



HER MAJESTY THE QUEEN IS INTERESTED IN WIRELESS TELEGRAPHY. THIS PHOTO. WAS TAKEN WHILE THEIR MAJESTIES WERE INSPECTING A STATION IN THE FIELD.

monly known as "earth induction," is sometimes used during an action. The apparatus consists of a pair of horizontal wires laid on, but insulated from the ground, and earthed at each end. One of the wires is in or near the front line, and is perhaps a couple of hundred feet in length. The other is several thousand feet behind, and is longer. The front wire has at its centre a sending buzzer, which causes ether vibrations to be carried through the medium of the earth to the wire in rear, which has in circuit a detector for picking up the signals. By this means an isolated post can transmit news of its progress to the rear, whence it may be forwarded to headquarters by other means.

Wireless instruments have also been used for detecting enemy signals. Their messages are frequently intercepted and deciphered, and much valuable advance information as to their intended moves has been gained, with the result that their carefully

defence. A number of them invariably takes part in any action. They issue forth from aerodromes in fleets, attended by a number of fighting aeroplanes to keep off marauders, and fly low over our line to be ready to observe any untoward movement of the enemy, any threatening danger, or any point which may be taken advantage of by the attackers. This information is immediately passed on to headquarters. Though aircraft are not yet an integral part of the Signal Service, there is little doubt that in the very near future a number of observation planes will form part of the equipment of a Signal Company. The contact patrol machines have distinguishing marks on the under side of the planes, so that they may be readily picked out by the infantry. They carry in addition to the pilot, an observer, who is provided with various means of signalling. These include wireless for communication with headquarters, specially designed electric lamps, which can be

sighted on to their object like a pistol, for sending information to the infantry by visual methods, and flares for attracting attention or for S.O.S. signals, indicating urgency. The observer can receive messages from those below, through the medium of similar lamps to those described above, or from

and so on through the alphabet. The examples quoted are naturally not the code actually used, but are merely given to indicate the method. Our superiority in aircraft has enabled this form of communication to be brought to a very high standard of efficiency. When one considers that even within



BRUCE BAIRNSFATHER WON THE UNDYING GRATITUDE OF ALL SIGNALLERS WHEN HE PRODUCED THE ABOVE CARTOON, WHICH SHOWS THAT SIGNALLERS HAVE THEIR TROUBLES AS WELL AS THE REST OF US.

"The Things that Matter," from "Fragments from France."

sheets laid out on the ground, whose surface is green with white underneath. By pulling a rope, the green is obscured and the white exposed. On releasing the rope, the white is again covered by the green. The morse code is as usual the mode of signalling employed, and though in this case it is necessarily slow, anything which might conceivably be required can be conveyed to the observer by the transmission of a single letter. For instance, A might mean "All is going well," B "Reinforcements urgently required," C "Ammunition running short. supplies must be pushed forward at once,"

the memory of the youngest of us, who are old enough to be on active service, the idea of flight at will, was almost laughed to scorn, the sight or mention of aeroplanes literally in flocks, at times hundreds being visible from any point, carrying out their dangerous duties in the most matter of fact way, is a never-failing source of wonder. That is, if one looks at it from the viewpoint of twenty—or even ten years ago. And yet one actually scarcely pauses to notice them. By a special dispensation of providence, the sense of proportion grows with requirements, and one very quickly adapts



THE LATE CAPTAIN W. H. PAYNE.

Who organised the entire scheme for military wireless training in the Commonwealth and at the same time retained his association with Amalgamated Wireless (Australia), Ltd., acting as Manager, during the absence from Australia of Mr. E. T. Fisk, the General Manager of that Company during 1915-16.

Captain Payne was eventually despatched from Australia as officer commanding a Divisional Signal Squadron. He lost his life while on active service in December, 1917.

oneself to new conditions to meet the exigencies of the moment. Otherwise we would be overawed by the stupendous

In East Africa. The Plight of an Aviator.

(Communicated.)

One generally supposes that the work of the Royal Flying Corps consists solely of dropping bombs, aerial fighting and reconnaissances, being "archied," and enduring other exciting experiences in the air, but one hardly expects to find an aviator suffering from undue attention on the part of wild animals.

It seems, however, that our pilots in East Africa, whilst perhaps not meeting with all the dangers incurred by those who fly in France, nevertheless have things to put up with which are not dreamt of by them while they are being trained for aerial fighting.

The experience of Lieut. G. in East Africa reads like a chapter out of one of the works of Jules Verne.

Lieut. G. was sent out from his aerodrome in British East Africa in order to make a reconnaissance. On his failing to return, machines were sent out to endeavor to discover his whereabouts, but for some time completely failed to locate the missing machine. At last one pilot, risking a lot, including a forced landing in the jungle, which would mean almost certain death, came down to within a few hundred feet, his attention having been drawn to a spot in the rank jungle grass owing to the presence of a large herd of elephants. Further inspection revealed the lost machine almost completely hidden by the long grass.

As it was impossible to land in this spot, and no trace was observed of the pilot, the machine was left. Subsequent reconnaissances revealed the fact that it had been torn to pieces by the elephants.

About a week later news was received that a white man had been found by native hunters in a very exhausted condition, and had been taken into their village. A party was sent out, and the white man

changes which have taken place in the condition of life during the last few years. Our senses would be numbed by the magnitude of the disturbance and we should succumb. Instead we find men and women, and even animals falling into the new ways of life as to the manner born.

The reader might possibly, in perusing this article, gain the impression that the Signal Service of the present day is perfect. Perfection is not yet, and never will be, claimed for it. This is one outstanding lesson, which has been learnt since we became the pupils of the Boche in methods of warfare—that no matter what advances we may make in scientific knowledge, something better is always attainable. All the inventive genius on both sides is continually at work experimenting on new ideas, or on new forms of old ideas, and each side is perpetually endeavouring, through its spy system, to steal the latest inventions of the enemy. When obtained, these are adapted to the use of the robbers against the inventors, and so the game goes on unceasingly, until that happy time when "the lion shall lie down with the lamb" and "a little child shall lead them."

was found to be the missing Lieut. G. When found he was wearing only a vest, sun helmet and boots, and his adventures after his forced landing were sufficiently exciting for the most blasé of pilots.

It appears that when Lieut. G. had landed, the elephants had been in the neighborhood, and had charged down on the aeroplane. Lieut. G. managed to avoid them, and, thanks to their attention being occupied with the machine itself, he escaped. That evening he spent in a tree, up which he had been chased by a lioness, who waited throughout the night for him to descend. When daylight appeared he left his tree and commenced his return to the aerodrome. On one occasion, when swimming a river with his clothes on his head, he had a narrow escape from a crocodile, and on landing at the far side, and spreading his clothes out to dry, he was alarmed by the presence of leopards. He again took refuge in a tree, and whilst he was in this precarious position, not knowing whether the leopards would ascend after him or not, a crowd of baboons appeared on the situation and made off with his clothes.

What happened after this is not known, for when Lieut. G. was found by the natives he was suffering considerably from shock as a result of his experiences, and was unable to state what had happened between the loss of his clothes and his rescue by the hunters.

Adventures of this type are hardly to be expected in the Royal Flying Corps, but it serves to emphasise the general activities of this branch of the Service in the wildest parts of the world, and shows that even a comparatively small sphere of operations like East Africa can give its fill of excitement as well as the most active area in France.

—W.T.B.

British Democracy After the War

(Specially written for "Sea, Land & Air")

By Professor Meredith Atkinson, M.A., University of Melbourne.

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Innumerable are the periodicals and books issued every week dealing with post-war problems. Many of the prophecies they make are both extravagant and misleading. It is almost impossible to foretell, with any approach to certainty, the directions of progress in trade and commerce and in political conditions after such a vast upheaval as this war. In some matters, however, we may fairly venture upon forecast. Take, for example, the domain of wealth production. Terrible as will be the weight of taxation, there will certainly be an enormous increase in the productive power of all nations, partly to enable them to shoulder the burdens of taxation and re-construction, but largely also as a result of the immensely improved methods evolved under the mighty pressure of military requirements. Edison has declared that Britain, by the adoption of the best machinery and the re-organisation of her factories, has at least doubled her productivity. It is impossible to say, with any exactness, what will be the effect of the intense international competition everywhere anticipated as certain to follow the war. But it is at least as likely that the need for meeting their national debts will provide the fullest outlet for the wealth of every country, as it is that commercial competition will be chiefly of the cut-throat character. The increasing prominence of German trade and the prospect of even keener competition with Germany after the war, have led men's minds to concentrate more upon the needs of wealth production than upon the more social and spiritual side of life. While I would not in the least belittle the need for immense improvements in our commercial efficiency, I would urge, as the merest practical good sense, the importance of remembering that the troubles of the world cannot be settled simply by improving our methods of production and increasing our national wealth. We can, of course, do much by the establishment of Councils of Industry, Trading Corpora-

tions, Arbitration Systems, Technical Colleges and the like. But these are, after all, the more mechanical side of the deeply human problem involved in the social conditions of all modern nations. It is largely because we have relied in the past too much upon these entirely material aids, without seeking to change the mind and attitude of men towards the social problem, that we are so seriously troubled to-day with international hatreds and social unrest.

Our greatest contribution as a nation to the world's history consists, not in our enormous wealth, but in giving to the world the principle of self-government. In spite of national faults and some back-slidings in our history, we rightly pride ourselves on the possession of a form of political genius, which has made modern democracy a practical possibility. This is what is meant by British freedom, the love of exercising individual liberty through parliamentary and local self-government. But we suffer as a nation from over-complacency in regarding our democracy as a finished institution. As a matter of fact, it is in the first place extremely questionable whether our democracy is deserving of the worship meted out to it, and still more questionable whether it has advanced beyond the merely primitive stage of its development. It seems to me that we can best help our nation by directing attention to the faults and limitations of democracy, for unless we make a great effort to remove them, our national wealth, however vast, will be swallowed once more in the vortex of universal war, or dissipated in the petty frictions of industrial unrest.

We have been too satisfied to regard the will of the people as fundamentally sound. While government by the majority is essential as a safeguard of our liberties, it is no guarantee of rightness of judgment. Because decisions are made in the mass, they are not necessarily inspired by justice or informed by wisdom. The psychology of

the crowd is notoriously apt to make violent mistakes. History is full of the terrible effects of policies determined by popular clamour. The demagogues are constantly flattering the people into a belief in their own infallibility. Surely the soundest organ in the body of democracy of to-day is not its brain, but its heart. If only we could ensure the head being as sound as the heart, democracy would fulfil its brilliant promise. But we have failed to educate the people on matters of public importance. The primary schools devote scarcely any time to subjects which teach the child his true relation to the world of which he is soon to be a citizen. He learns little of the foundations of the social order, or of the underlying principles of family life and the State; so seriously have we neglected the cultivation within the young of that inner discipline and sense of unity with one's fellows, without which true citizenship cannot be realised. The present chaos in Russia is largely due to the constant inculcation of mechanical obedience to external authority. In a democracy like that of Australia, we may regard ourselves as possessing far greater freedom of will than the average citizen of old Russia. But it is nevertheless true to say that even we have failed to cultivate within our own minds, the power to realise what is the next step and to take it without excess of zeal. Australian liberty is much more apt to express itself in rights than in duties. While we have by no means reached the limit of the privileges we may hope to enjoy as citizens of a great Commonwealth, our progress is sadly hampered by a chronic want of social responsibility in great numbers of our citizens. Whoever has stood in a crowd at election time, listening to speeches and interjections, must have been depressed by the crass ignorance and crude prejudices of the great majority of the audience. We charge our politicians with corruption and inefficiency, but they are largely what we allow them to be. To attempt to solve the problems of science and production while leaving our political education in its present state of neglect, is to render impossible the best use of the materials of our civilisation. What is wealth meant for if not to raise the general tone of civilised life, and to make it more possible for men to live on higher planes of thought and action? What shall it profit us if we heap up wealth and fail to bring to mankind true social peace and happiness? This is where the common-sense idealist proves himself to be the most practical of men, for he recognises that

democracy will fall into festering corruption and civil war unless we seek to satisfy something higher than man's demand for wealth.

What is it that makes men quarrel, either as individuals or nations? The sources of conflict are nearly always traceable to something which could be removed by better understanding and a thorough education in the principles of social rights and duties. Almost invariably some matter of self-interest or mistaken opinion is to be found at the root of the differences that divide man from man. If it were possible for the whole of mankind to sit round a table and discuss all matters of difference, wars would cease and social injustice become a thing of the past. I believe strongly enough in man's innate commonsense and benevolence to have complete faith in the future of democracy, if rightly educated. It is perfectly possible to bring to men's minds the same spirit of fairness and compromise as that of the council table. No sensational method is required to inaugurate such a social reformation. By elementary lessons in civics and economics in our schools, most valuable instruction may be given in the relation between citizen and state, the production and distribution of wealth, and in social and ethical ideals. Such courses are already given with great success in American schools. But we could go further. This teaching could be maintained throughout the compulsory continuation of the growing youth's education. His approach to the exercise of his right to vote could be made conditional upon his passing an examination in the simple principles of economic science and political institutions. We should then make absolutely certain that the average voter has given proof of general intelligence and political knowledge. Such a civic training could only be completed by opportunities for the exercise of political functions through Local Government, Co-operative Societies, political and industrial organisations, and other forms of mutual aid. British democracy will fall short of its high promise, unless it sets about the intensive cultivation of the minds of its growing citizens. What a wealth of mental and spiritual resource we are leaving untapped. Every year there come to manhood and womanhood millions of British citizens almost entirely unfit to make their proper contribution to our common progress. We must bear in mind, then, that the greatest of all post-war problems is not merely to "make the world safe for democracy," but to make democracy safe for the world.



The Cruise of the U29



By C. A. JEFFRIES.

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The High Port Admiral of Cuxhaven was dining his nephew, First Lieutenant Rosendorf, who was about to depart in the U 33, on that submarine's maiden trip. He was proud that his kinsman should have been appointed to this last masterpiece of German under water naval architecture, but he greatly feared for him because so many submarines went out and so few returned. He strove to cheer up the obviously depressed young man.

"The times are strenuous and things that are not in accordance with the game of Kreigspiel are justifiable on the grounds of national expediency. Therefore I tell you that you must fight these Englishers hard. In the words of their Shakespear's immortal Macbeth, be bloody, bold and resolute!"

"It wasn't Macbeth, it was his wife said that. This stark policy is going to have some unpleasant after effects, my uncle. I see them among my men. The Fatherland will be a pleasant place to live in after the war, with the nice animals we are turning the men into."

"The work is gruesome!" said the Port Admiral, filling his nephew's glass with his own hand.

"It is," replied the submarine commander. "It savages the men so that after three trips one might as well have a crew of tigers. Discipline is hard to maintain. Last time I had to shoot three men with my own hands. Not all the under water boats that have failed to return have been captured by the Englishers. There have been murders, mutinies, things told of in whispers among the men."

"Absurdity! How can the men know these things? The dead do not return, and the English will not exchange submarine prisoners."

The Lieutenant smiled grimly:

"The Englishers are wise. They send back the men surreptitiously, that they may tell of the horrors they have endured. I have such a one among my crew, the man Hans Schultz, the sole survivor of the U 29. Make him drunk, and he will tell you a story—a fine story that will make all men enthusiastic to embark on a submarine!" And he laughed a loud bitter laugh, and filled his own glass and drank with a mighty gulp.

"But the U 29 was lost or captured with all hands!" said the Port Admiral. "I was reading the report only to-day."

"Was she? Well Hans Schultz came back, and was at once sent to the base, and is now in my crew, and, I tell you, when he is drunk, he talks. Let me send for him."

Hans Schultz was a short stocky man, with the dark hair and complexion of the Bavarian. After he had assimilated two bottles of champagne he became loquacious and inclined to talk, regardless of consequences. He was an engineer and had published a small brochure on the handling of engines in aeroplanes; so the Port Admiral graciously permitted him to sit and smoke a cigar while he told of the cruise of the U 29.

"May it please your Excellency. We left the base in the morning, keeping on the surface till clear of the mine field, when seeing smoke on the horizon, our captain submerged. For two days we drilled the men practised diving, and under-water evolutions. All this, Excellency, is necessary to make the new members of the crew conversant with the work. And all crew have new men in them. The work is not healthy.

"The third day out we saw a Norwegian ship. She was going towards England, and no doubt contained supplies or munitions of some sort, and the captain said she must be sunk. We sank her. The sea was rough and I do not know if the boats escaped.

"Next morning we were on the surface, and received wireless information of three munition ships which were ordered to be sunk. And the boats shelled and destroyed, so that the English sailors should be afraid to go to sea. So we went to intercept them. At midday we saw a speck in the sky, then another. They grew larger, and then we saw they were seaplanes. So we dived.

"We made all speed under water, for these great birds drop nasty eggs, Excellency. Fortunately, the sea was rough, and the agitation of the waters served to conceal us. Suddenly the electric motors stopped.

"It was not for want of current, it was overload, and it was obvious that both pro-

pellers were fouled. We could not move an inch except up or down. Then we heard the thrash of the propellers above. Destroyers were arriving, and the captain held his head with both hands. We had run into a cursed trap; a net that fouled our propellers and called up a destroyer flotilla when it caught us. They are dangerous, these Englishers.

"But so was our captain. He knew we were in a strong current, so he let the boat drift with the current, instead of sinking to the floor of the ocean; and presently we heard explosions. Our captain commanded that oil be shot through the water cocks into the sea to make the Englishers think they had destroyed us. This ruse succeeded, and we heard the thrash of the propellers die away in the distance.

"At last our captain came to the surface, and as the periscope peeped out we saw a big 10,000 ton steamer in the distance. She opened fire and fled, and, of course, we could not pursue. The sea was clear and we found the net was all over the boat and all tightly wound round our propeller blades, and we attacked it with the oxy-acetylene and in an hour had all clear. Then we started to look for those munition ships.

"Again we ran into one of those cursed nets, and again the seaplanes appeared in the sky, and we knew that from somewhere destroyers were rushing at us. Once more we tried to clear the propeller, but the seaplanes came so fast we had to dive. Fortunately it was evening, and when we dived we were comparatively safe so long as we remained in darkness.

"For hours we drifted with the current, the only lights being the electric torches of the officers, who told us that a lit submarine is visible from a great height, a thing, your Excellency, I do not understand nor believe."

"At last the captain, unable to endure it himself any longer, ordered the lights to be turned on. We came to the surface and peeped out. A shot greeted the appearance of the periscope, and hit it. All was blank. Again we dived, but heard no sound of propellers. We shot gallons of oil into the sea and still drifted with the tide.

"With the morning we came to the surface and discovered an empty sea. Again we cleared the propellers and reported by wireless. Back came the message to go after the three munition ships, and the most likely place to catch them was given also.

"Two clouds of smoke on the horizon told of approaching ships, and we made towards

them. Presently we dived and waited, and in due time the first ship came within range.

"The torpedo went home right below the great single funnel. She rolled right over, struggled half way back again, like a great wounded animal, and then lay on her side. They were launching boats and we went after the second ship, but could see only a great cloud of smoke. As we approached it, the light was fairly blotted out, and we had to come to the surface to see. But the ship had gone.

"We shelled the boats and sank them all, which, Excellency, was an accident, because one should have been spared to spread the fear of our frightfulness. The great ship was still afloat, and to make sure of her we flung a few shells into her also, and suddenly she stood right up on her stern and vanished to our cheering.

"For two more days nothing happened. We saw nothing, heard only a few messages, which we could not understand, and then, when the light was climbing out of the sea, a big steamer suddenly appeared and came straight at us. This craft had a big gun forward, and as she bore down on us opened fire. We fired two torpedoes and both went wide. We opened fire with two guns and stood off, circling round, only to find he had another gun with which he could return our fire. We shot his boats to pieces; we swept his decks clear, but he still fought on. At last we had to dive, and we only just escaped. We heard the thrash of the great screws as the ship rushed over us, and then we came up to sight for a torpedo, only to find ourselves in a cloud of sooty smoke. The ship had gone and the instruments could detect only the faintest whisper of her propellers.

"Then we, too, raced away, with the engines clanging at top speed, for an escaped ship meant a covey of hydroplanes and destroyers. But fast as we fled they came faster, and we dived as the specks appeared in the sky, raced for another ten minutes and then came to rest on the sea floor.

"They burst bombs all about us. The ship trembled and quivered as the detonations beat against her sides, straining them till in some places water squirted in momentarily. We rose a few feet and crept away, but by some devilish means of their own they followed us.

"How long it was, Excellency, I do not know. It seemed ten thousand years. The air grew heavy, but that awful pursuit continued. Every time we poked a periscope out it was greeted with a shot. Time and

again we squirted oil into the sea, but they took no heed. Surrender seemed inevitable.

"Even in such positions, Excellency, the body must have its nourishment. We had to eat and the herr captain kindly gave us champagne to keep us up. There were some who wanted to surrender although the captain told us the Englishers hang submarine crews. One man went mad, Excellency, and the herr commander had to shoot him. We put his body through the torpedo tube hoping it would convince the Englishers above that we had been blown to pieces. But it was a mistake, because a little while later bombs burst all around us. The herr commander shot two more men, but we did not send their bodies out—they might reveal our position.

"We were still drifting with the lazy currents. The oxygen reserve was all gone. We slapped and beat one another to keep awake, and at last one man went to sleep and died. Then the herr commander gave the order to come up and surrender. We came up, and found the sea empty. The Englishers had gone. We laughed and cried and sang, and drank in the good, pure air. Ach, Excellency, it was better even than your perfect wine.

"A great striped and spotted ship climbed over the rim of the world and came on. We had two torpedoes left, and waited. There had been no time to bury the two last men the captain had shot. The steamer was very fast, and she zig-zagged very badly, and both torpedoes missed. We came up and started to shell the great clouds of smoke, and raced after the quarry. Ach, Excellency, but that ship fled fast and as we came out of the cloud of smoke, a shot went right through our conning tower, blowing the hatch right away.

"Then one of ours brought down a mast, and we cheered, but they cleared it away and again that ship fled on, firing all the time. Big shells they were, too, Excellency. One of them burst right over us and the splinters perforated the deck; then another burst alongside, and tore a great hole. We had to stop fighting, and the ship fled on. We had two-men killed and four wounded, and the submarine was in a hopeless plight. It was a question of only a few hours and we would sink.

"We sent out the S.O.S. call, and a speck appeared in the sky. We had a white flag ready, and awaited the coming of the hydroplane. As he swooped down like a great bird, we waved the white flag and tried to speak to him by wireless. But he

seemed filled with a blind fury and hurled a bomb at us. It burst on the ruins of the tower, killing another man and bursting one of the oil reservoirs, and starting a fire which nothing could put out.

"Imagine our horrible plight, Excellency: On a burning submarine, half the crew killed or wounded and helpless to save themselves from the deck that was growing so hot; and all around the sleek, oily looking waves that threatened to drown us but would not fight the flames of the burning oil. And that great bird, circling round, calling by wireless for another plane to come and finish us off with a bomb, because we had sunk a ship and all hands, and were now in a bad way. Suddenly he went racing away, and the minutes dragged into hours. Then a great ship climbed over the ridge of the ocean, and seeing the smoke of our burning, came towards us, signalling that they would rescue us. They said that, Excellency, but when they saw what we were, that ship turned like a flash, fired a gun at us twice, and raced away under cover of a cloud of smoke, the pigs.

"All that could, got into their safety dresses, and the deck was so hot that we could stand on it with only one foot at a time, for it burned us through our thick sea boots; and the wounded were screaming with pain. Then one of the wounded went mad and started to shoot at us till he was shot dead; and another made a great effort and got overboard, and went down screaming. Then we saw two hydroplanes come towards us, and although we waved the white flag, they ignored it, and one flung a bomb, and the submarine split in two and went down, fizzing and hissing.

"Where it came from I could never make out, but suddenly I saw a long greeny gray motor launch, and the sailors on board helped us out of the water and disarmed us. There were only four of us left; all the rest of the company had gone.

"The Englisher accused us of sinking a ship with all hands and sinking the boats. We denied it, but one of our wounded men swirling by, was dragged on board, and he cursed us for his suffering, and told the Englishers that we were worse than pirates and were all murderers. And he was a murderer too, and our underwater boats were murder craft; and all our war was murder and rapine.

"The great hydro-aeroplanes circled round, and suddenly flew off and hurled bombs, and the motor launch dashed for the spot, and we saw them put down water

bombs, and we heard the detonation, and presently a dead body swirled up, and then more and more, and we knew that the submarine below had been blown in. And then they looked at us as though they would have liked to have sent us to join them. So they did, indeed, Excellency.

"But they refrained and they brought us to the port, and we were separated, and I never saw my comrades again. One day I was given a chance to escape and some gave me assistance, and said:

"Go back to Germany, and whisper among the people how we treat your underwater murder boats.' But I have not spoken, only to the Herr Lieutenant and yourself, Excellency."

"It is well, Hans;" said the Port Admiral. "I shall think over it, to sea you shall not

go to-night, Hans; you have earned rest."

"Thank you, Excellency, I am grateful."

The Port Admiral smiled and pressed a bell in the table. Two armed guards entered, the Port Admiral nodded:

"See that the good Hans has sheets in his bed to-night!" he said. The guards bowed and led Hans out.

The Lieutenant looked at his uncle. The old man twined his fingers:

"He is dangerous," he said, "and the All Highest has ordered that they be silenced. Hans will sleep well to-night."

He refilled the glasses, and presently an orderly entered and saluted.

"The sailor is asleep, Excellency!"

His Excellency nodded, drained his glass and lit a cigar.

PITY POOR JACK!

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Mr. Editor,—I am an individual with a grievance and I seek your powerful aid to alleviate it. I am told on good authority that I am one of the most prized possessions of some three-hundred million people in the world to-day, and that they call me their National Flag. And I am further told and verily believe that not one in ten thousand of my owners knows how I came about, nor for the matter of that, which way up to hoist me. Sir, this ought not so to be, for I am a very great and noble flag both in my origins (for I have more than one), and what I symbolise to my owners. Though I may be primarily just so much silk or bunting, my design and coloring are full of meaning, and though my cost may be but a few shillings, my value is priceless, for in my folds I carry the Empire's honour and the history of centuries is figured in the heraldry upon my field.

I represent all that patriotism means. I stand for liberty, freedom, and equal justice, in quiet English counties, among Canadian snows, on Africa's broad veldt, and the burning plains of India, among the rich West Indies and the great self-governing colonies of Australia, and not least, "For a security for such as pass on the seas upon their lawful occasions." Countless thousands have given their lives to keep me unstained from dishonor and defeat, and to-day countless thousands are making the supreme

sacrifice—that principles for which I stand may not founder in a cruel sea of barbarism and savagery. I think, therefore, Sir, that I am justified in calling myself a very great and notable thing—worthy a little accurate knowledge on the part of my people, and certainly too good to be hung upside down, by reason of sheer ignorance. How did I come to be? My oldest component, ages old in fact, is the great cross of St. George, the Patron Saint of England, the broad red cross on the white or silver field or ground. In this form I went before the crusaders as they strove to wrest the Holy City from the grasp of the infidel. So, they wore me on their shields and so to-day I am flown on an admiral's ship—a thousand years of unbroken use and significance. I continued thus purely English in my symbolism till the partnership between England and Scotland came about in April, 1605, when the problem was presented of devising the union flag in such wise as to denote the partnership, and as St. George in England, so St. Andrew in Scotland was pressed into the service. St. Andrew's Cross is a saltire or X shaped cross of white on a blue field (argent on azure), and this was combined with St. George's Cross in a very simple and effective way, St. Andrew's white or silver cross on its blue ground, surmounted by St. George's Cross with its white or silver ground cut down to a narrow border, the two crosses

being quite clear and distinct, yet happily combined. Charles 1st issued a proclamation on May 5, 1634, forbidding any but ships of his navy to carry this union flag, all merchantmen being required to show according to their nationality, either the cross of St. George or St. Andrew. Later Queen Anne in 1707 prescribed that merchant ships should fly a red flag, "with a Union Jack described in an upper canton thereof next the staff," the union flag, as before,

when Ireland came into the partnership and a flag had to be devised to represent the union of Great Britain with Ireland. Then trouble began. Ireland's Patron Saint, Saint Patrick, had no cross, as he never suffered martyrdom for his faith and how the red saltire on the white field or ground came to be associated with him is not at all clear. At all events it had become recognised as his, and as such had to be brought into the union flag. But how? If placed over



THE CROSS OF ST. GEORGE.



THE CROSS OF ST. PATRICK.

being reserved to the navy. This proclamation of Anne's is interesting, because after many changes the same regulation was re-made on October 18, 1864, when the "Red Duster" again became the flag of our mercantile marine. It is further interesting, as the term Union "Jack" was used for the first time. The first union flag did not

St. Andrew's flag and of the same width, it would clearly obliterate it; moreover, it would then appear as a red cross on a blue ground, an heraldic misdemeanour or something worse, for the rules of heraldry straitly forbid the placing of colour on colour or metal on metal, and while the red of St. George on the white (or silver) ground of the



THE CROSS OF ST. ANDREW.



THE "JACK" COMPLETE.

have a very long life. On the death of Charles I, the partnership between England and Scotland ceased, and the flag was dis-established during the Protectorate, when Oliver Cromwell returned to the use of the plain flag of St. George. At the restoration Charles II resumed the use of the union flag, and its use was continued till 1801,

field is correct, as is also the silver cross of St. Andrew on the blue ground of the field, to place the red cross of St. Patrick on a blue field would be plainly inadmissible. Were the cross of St. Patrick made narrower than St. Andrew's, so as to show a white margin of the latter under it, this would satisfy the Herald's College, but would

mortally affront the children of St. Andrew, who would find their beautiful silver cross surmounted by St. Patrick's and merely acting as an edging to it. Hence the somewhat awkward-looking compromise that breaks the continuity of direction of the arms of the Red Cross of Ireland, by its portions being thrown out of the centre of the white oblique bands, so that in each portion the crosses of Ireland and Scotland are clearly distinguished from each other. This compromise notwithstanding, no more effective or beautiful flag flies to-day than the Union Flag of Great Britain and Ireland.

The difficulty was not yet quite over. The Cross of St. George divides the field of the flag into four quarters or cantons, and heraldic usage has assigned a differing honorable value to each canton. That next the staff in the upper part of the flag is the first quarter, the one diagonally opposite the fourth quarter, the one below the third quarter, and the one abreast it the second quarter. It will be seen that while Scot-

land's white Saltire Arm is over that of Ireland's in the first quarter, it is under it in the second, over it in the third, and under it in the fourth—a very nice adjustment of the rival claims of the two junior partners in the concern. And now one sees why there is a right and a wrong way up to hoist me, and if the friendly maker has not given your flag a wooden toggle to show which is my upper corner, remember always that the broad white Cross of Scotland is uppermost in the first quarter, and I shall no more be hoisted upside down. There is just one other point requiring explanation. Outside the Saltire Arms of St. Patrick's Cross you will notice a narrow white margin. That is a fragment of the original white ground of St. Patrick's Cross, just as the white border round St. George's Cross is, as we have already seen, an indication of the white field of his banner.

Your faithful servant,

"JACK."

GOD SAVE THE KING.



HIS MAJESTY KING GEORGE.

Our Maritime Peril

By O. M. Bagot.

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The reader has learned how the Norddeutscher Lloyd began to spread out octopus like, the first oversea vessel, the Bremen, having arrived at New York, and it will naturally be assumed that the younger Crusemann was elated at the reception the vessel received. The cordial welcome augured well for his financial benefit, in addition to being a strong stroke for the beloved Fatherland. Consul Meier was no less pleased, and at once began to figure prominently in the venture. The Consul was

portance, Meier brooked no interference, he being the usual type of blustering German, so it came natural to find him at the head of affairs when the Hudson, Weser and New York, sister ships to the British built Bremen, arrived at New York.

It is permissible to remark here that the vessels named certainly warranted the attention they received, for as in every enterprise the Germans entered into, no effort or expense was spared to create a good impression. The vessels were 334ft. by 42ft. and,



JOH. E. LOHMANN

TO WHOM AUSTRALIANS CAN LARGELY ATTRIBUTE THE REMARKABLE DEVELOPMENT MADE BY GERMANY
IN THE AUSTRALASIAN TRADE.

a man of strong personality, and young Crusemann, though alert, and possessing business acumen being somewhat retiring in character became overawed, consequently it is not surprising that Meier soon assumed a position of importance in both the official and business side of the venture. However, there was no rift within the lute for some time, and things progressed very satisfactorily. But, once he began to assume im-

portance, luxuriously fitted and well equipped in every respect. Even the second class passenger was well provided for in the way of comforts, so it naturally followed that from the outset the company secured a very fair share of the ordinary traffic, as may be gleaned from the fact that some years after its inception, a weekly service between Bremen and New York was inaugurated and no less than eight

large vessels were employed. The success exceeded even the German anticipations; a foothold had been secured, why not expand was their next idea. It was no sooner thought of than it was given effect to, so we find that on the 1st March, 1866, the N.D.L. "Baltimore" arrived at Baltimore, direct from Bremen. One is forced to remark naturally that great as the achievement of building a fleet of steamers and establishing two oversea services in little more than ten years, the later developments were more rapid, for it was about this time the Prussian Ruler of Germany began to take a hand in affairs.

At first the interest disclosed was not too pronounced, but it gradually developed until June, 1869, when Kaiser Wilhelm I, accompanied by Prince Adalbert, the Grand Duke of Mecklenburg and Counts Bismarck and Moltke, paid a visit to the Deutschland, a palatial liner just launched, and in the course of a speech the Kaiser openly referred to the interest he felt in the oversea development of the N.D.L. It is interesting to note here that Meier again played the leading part in the official welcome.

Soon after this memorable occasion the N.D.L. sustained a serious loss by the death of Edward Crusemann. Though Meier had begun to show his hand it was Crusemann, senr., who possessed the business ability and for a time after his death, the company was at a loss to secure a suitable man. In the end Herman Peters and Carl Heinrich Stockmeyer assumed the responsibility of management, but it is doubtful if at any time they were more than figure-heads. Peters died in 1872, and Stockmeyer controlled affairs till 1877, when Joh E. Lohmann assumed the managerial control. It is to Director Lohmann, Australasians can directly attribute responsibility for a large

share in the development of the N.D.L. in this part of the world. His character disclosed all the traits of the real German. When it suited his plans he would be as courteous as possible, when it did not he was dominant, but at all times he brooked no interference from anyone. His critics will, however, admit that he possessed remarkable business talent, which, combined with his great love for Germany, made him a formidable rival to Herr Ballin the Shipping Magnate, whom we have been so often told is a close friend of the Kaiser. It is unnecessary, however, to dwell upon the personal qualities of Director Lohmann, sufficient being that it was he who prepared the initial scheme for the N.D.L. expansion in Australia.

But it is essential to pause for a moment to review happenings from 1869 until 1877. It was in 1869 that a service to New Orleans from Bremen was opened, and this was followed by a service to Central America. The Franco-Prussian War caused the N.D.L. some inconvenience, but the difficulties continued for no more than 12 months. In 1876 a service to South America via Antwerp and Lisbon was inaugurated, the sailings at first being monthly, but two years later it became necessary to dispatch vessels every fourteen days.

It was during February, 1882, that the N.D.L. celebrated its 25th anniversary, and in reviewing the company's operations it was stated by a prominent speaker that the property owned represented 97 vessels, of which 29 were transatlantic liners, 7 European traders, and 14 River steamers, and although in existence for a much shorter period, the N.D.L. fleet had but one serious rival, the Peninsular and Oriental Line.

It was in 1885 that Australia attracted that N.D.L., and with the assistance of Prince Bismarck, the company received sufficient financial inducement from the Reichstag to induce expansion in this direction. The German-Australian Line soon followed the lead of the N.D.L., and it is from that period we will entertain readers in next month's issue.

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WHEN THE FIRST UNITS OF THE AUSTRALIAN NAVY WERE ORDERED, SIR WILLIAM CLARKSON SUPERVISED THEIR CONSTRUCTION IN ENGLAND.

HE WAS PROMOTED TO THE RANK OF REAR-ADMIRAL IN 1915, AND IN 1918 WAS MADE A KNIGHT OF THE BRITISH EMPIRE, IN RECOGNITION OF HIS VALUABLE WAR SERVICES.

SIR WILLIAM CLARKSON IS NOW CONTROLLER OF SHIPPING FOR THE COMMONWEALTH AND THIRD NAVAL MEMBER OF THE ROYAL AUSTRALIAN NAVAL BOARD.

Sir E. Owen Cox, K.B.E.

Chairman of the Central Oversea Shipping
Committee and Deputy Controller of Shipping
for the Commonwealth of Australia.



SIR E. OWEN COX HAS BEEN PROMINENT IN AUSTRALIAN SHIPPING AFFAIRS FOR MANY YEARS, AND RECEIVED HIS KNIGHTHOOD IN RECOGNITION OF HIS VALUABLE SERVICES TO THE EMPIRE DURING THE WAR. SIR OWEN COX OCCUPIES THE POSITION OF MANAGING DIRECTOR OF MESSRS. BIRT AND CO., LTD.

Beware A Judas Peace

By WILLIAM LEWIS

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Mr. BRENNAN said he did not propose to join in any further fatuous expressions on the part of the present Government in regard to what they were pleased to term "the securing of a victorious peace." A resolution which expressed an inflexible determination to continue the war until they had won a victorious peace would receive no support from him.

Mr. CATTS objected to the continuous insistence upon a victorious peace. Why not substitute an honorable peace or an equitable peace?

Mr. HIGGS proposed to move that "This House is not opposed to peace by negotiation."

Mr. MATTHEWS expressed the opinion that "greater good would follow a less jingoistic attitude on the part of those crying for an unconditional defeat of Germany."

Mr. FINLAYSON: "The most unjust peace was better than the most righteous war. Recourse must ultimately be had to negotiation."

These foolish, impotent words, though spoken in the Parliament of the Australian Commonwealth, can have no effect whatever on the great world issue at stake.

A weird accident has placed these men in a position where they can, with impunity, utter sentiments that may, to a small extent, embarrass our efforts in the recruiting scheme now taking shape. But we must not lose sight of this essential fact—whether we put forward our best efforts to obtain reinforcements for our men at the front, or retire ignominiously from the struggle; either determination on our part can affect, only to a very small degree, the ultimate and triumphal completion of the Allies' task. That will be settled with or without the help of Australia, as she may elect.

But, when the day of reckoning for Germany dawns, what a fine and great thing it will be for Australia to sit at the council board of the Nations and feel that she has earned the right to make her voice heard in that great assembly!

Men are not now being asked to join in a hopeless effort to assist a failing, dying cause, but rather to share in that great triumph that is now, even at this very hour, most surely approaching.

Men are being called to enlist under the banners of victory; they are asked not to lose and die, but to win and live in that great world future whose roseate dawn is even now visible to the eye of hope and faith.

It is useless to belabor these misguided men with hard words; they are rather sub-

jects for our compassionate contempt. Had it been the hard lot of these same men to have hurried to that wrecked schoolroom in London, there to find the bodies of their little ones lying bloody and mangled among the ruins, they would not be talking of "Peace by negotiation." Vengeance swift and fierce would be their passionate demand.

Ask those sturdy fishermen living in their little hamlets on the North Sea, whose brothers and sons have been savagely sent to their death while pursuing their hard and toilsome calling, how they view "Peace by negotiation."

Ask the English mothers of murdered children in quiet coastal towns, raided in cold blood from sea and air.

Ask the despoiled and tortured people of Northern France. Ask hapless, dauntless Belgium.

For these men, who have never been within the sound of cannon, men who have never inhaled poison gas or been scorched with flame-throwers, for such men to calmly rise from their comfortable chairs and preach of "Peace by negotiation" within the hearing of our returned boys, who have endured all these horrors, would be incredible did we not have the record of their words in cold type.

Let us try to be charitable, and say of them—"Forgive them, for they know not what they do." At the same time, let them be told that the civilised world knows there can be no honorable peace without the crushing and hopeless defeat of Germany.

That defeat is surely coming. Her wild and savage struggles, now more convulsive

than strong, are but the presage of her inevitable doom. Utter and irretrievable disaster is creeping ever nearer—at times hesitating, perhaps even drawing back, but coming on, yet ever on, as surely as our Australian bush fires.

It may be the task of America, the great, implacable Western giant, to finally throttle the Teuton gorilla. That country loves too well peace, with its splendid, bloodless victories, to tolerate an armed truce such as Germany desires. The clear vision of Wilson, her inspired leader, discerns every pitfall into which Germany would lead us. There will be no compromise with criminals from that quarter.

A great people, like the Germans, cannot be denied their place in the family of nations. After the crash and ruin of the German debacle, the scales may fall from their eyes. But it must be a chastened, penitent, disillusioned Germany that will again be admitted to the brotherhood of men, an awakened Germany that will recoil with incredulous horror from the cold, relentless record of the crimes that stain her former nightmare existence.

Then will the name of her present rulers, indelibly branded on the tablets of history, be recalled by future generations of their fellow-countrymen with shame and horror, perhaps with a shivering fear, when remembrance warns them that the same racial blood courses through their veins. Then may they, indeed, fall on their knees and pray that the slumbering tiger within them may never again be awakened.

The words at the head of this article, "Beware a Judas Peace," form the title of a powerful article in a recent issue of the "Saturday Evening Post," which closes with these words—

"We may pertinently enquire, what would be the preliminaries of such a peace? Whom could the Allies treat with? Not with the Kaiser, because he is foresworn; his oath is worth nothing, whether he pledges himself as monarch or as man. Tirpitz, Hindenburg, and the imperial ring could not be trusted. They boast that they hold no word as sacred, and they are busy fabricating lies, plots and conspiracies which they sow broadcast. Until German troops shall evacuate the territories they have seized, and shall disarm, it would be suicide, therefore, for the Allies to check their military operations, to withdraw their troops from any position, and much less to think of reducing their forces by a single man.

"There is a moral consideration which cries out far more solemnly against the Kaiser's schemes. Every ally, every neutral, every man or woman with a sense of justice, must regard such a compact as compounding with the most atrocious criminal in history. It would make us at least the extenuators of all the German crimes, of the outrages on women and children in Belgium and France, of the massacres in Poland and Armenia, of the systematic starving of prisoners, of the deportation and enslaving of millions of non-combatants, of the deliberate ravaging of towns and countries and the destruction of works of art, of the negation of the primal trust of man in man, and of the spirit of mercy and justice without which civilisation cannot endure.

"Who among all the Allies will take the odious, bloodstained hand of William of Hohenzollern in his and say, 'Let us be friends'?"

WAIL OF THE WITLESS.

My Tuesdays are meatless,
My Wednesdays are wheatless,
I'm getting more eatless each day;
My home it is heatless,
My bed it is sheetless,
They are all being sent to the Y.M.C.A.
The bar-rooms are treatless,
My coffee is sweetless,
Each day I get poorer, tho' wiser;
My stockings are feetless,
My trousers are seatless,
By Gosh! I do hate that old Kaiser.
I am losing my fat—
Now, what think you of that?
I am actually thin and bony.
Put it down in my log,
That now for my grog
I must go for Egg Nog to Samoni.

—Anonymous

A FORECAST.

When the War Will End.

"Absolute knowledge have I none,
But my aunt's sister's washerwoman's son
Heard a policeman on his beat
Say to a laborer in the street
That he got a letter just last week,
Written in Latin, or maybe Greek,
From a Chinese cook in Timbuctoo,
Saying that the negroes in Cuba knew
Of a colored man in a Texas town,
Who got it straight from a circus clown,
That a man from the Klondike heard the news
From a gang of South Americans
About someone from Borneo,
Who saw someone who claimed to know
Of a swell society female
Whose mother-in-law would undertake
To prove that her seventh husband's niece
Had stated in a printed piece
That she had a son who had a friend
Who knew just when the war would end."
—From the "Marconi Service News."

THE MATRIMONIAL WIRELESS

By HAROLD ADAMS

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Had Roy Kingsford chosen a theatrical instead of a telegraphic career he would have been the darling of all the women and the envy of all the men, for he was undeniably handsome, and was known all over Magnolia Town as "The Greek God." His good looks and debonair manner had got him into all manner of scrapes, and his mother and sisters offered up prayers of gratitude every night that their Adonis had got through another day without some irate husband threatening to either fire a gun or shoot a co-respondent writ at him.

Yet Roy Kingsford was entirely innocent of wrong doing. His trouble was that he made such a perfect appearance of it. But even for that he was not to blame, for as his sister Bessie, 10 years his senior, said, it was always a case of kidnapping.

There was consternation among the flirty dames and love-sick damsels of Magnolia Town when it was announced that Roy Kingsford was off to sea, to be a wireless operator on one of the great interstate liners. But in the Kingsford domicile there was a great joy and feeling of relief, and Mrs. Kingsford sat back and remarked delightedly: "He will be out of the way of temptation now." To which his sisters purred joyous assent.

As a matter of fact, Roy's temptations increased about one hundred fold; but there were compensations, and Roy discovered that the chances of his breaking the eleventh Commandment, and being found out, were considerably reduced. But his mother and sisters were ignorant of all this. It never occurred to them till Mrs. Browne-Joynes, the banker's wife, who had made a dead set at the boy, announced her intention of doing a round-Australia trip for the benefit of her health. Then Mrs. Kingsford and her daughters sat up very straight and held a council of war as to the best means to meet the threatened danger.

"It's a million to a peppercorn," said Mrs. Kingsford, "the disgraceful cat goes on the 'Bunyip.' It's only just a ruse to get near him. By the way, is she taking Violet, her step daughter, with her?"

No one had heard of any trip from Violet Joynes, and Mabel, the youngest daughter, said savagely: "No jolly fear! Roy and Violet are in love with each other, and when he used to go to see Violet, she would keep him to herself, and never let Violet come near. Roy doesn't care a fig for Mrs. Browne-Joynes."

"You keep quiet, Mabel," said her mother. "Mr. Browne-Joynes was dreadfully jealous of his wife and Roy. She is sure to go in the 'Bunyip'; Mr. Browne-Joynes will put detectives on board, perhaps several, and then, goodness knows what won't happen to dear Roy."

Sister Bessie proposed that dear mama should call on Mr. Browne-Joynes and ask him to safeguard both families by forbidding Mrs. Browne-Joynes to travel on the "Bunyip." But Mrs. Kingsford shrank from the ordeal, although she admitted it was straightforward and would be proof positive that Roy's family had actively endeavoured to prevent any mischief happening. In fact, it was so good an idea that she thought dear papa should do it right away. Men could talk to each other so much easier.

In the end it was decided to ask dad to do it; mama saying one man could talk to another so much easier. As the matter was urgent, mama and Bessie went straight down to Mr. Kingsford's office and interviewed him on the subject.

Papa Kingsford listened with astonishment; then he lit a cigar, and leaned back in his chair and expressed a hope that he might lose his immortal soul if he ever did such an eternally lost silly dashed trick.

"But, she'll ruin the boy and herself, too; if you don't!" snorted Mrs. Kingsford. "John, dear, I really must insist upon it."

"I don't care a tinker's benediction, Mabel!" snorted Mr. Kingsford. "If she likes to make a fool of herself over the boy, it's her blessed funeral, Roy's under age for seven months yet, so he's not liable for costs, damages, or anything else if old Joynes does get a divorce. And, anyhow, as he has to sow his wild oats it is better he should get his agricultural experience with something tasty like the lady in question."

Mrs. Kingsford rose:

"John, I had hoped that if you had no respect for your wife, the mother of your children, you would have some for your daughter. John" (sitting down and beginning to sob), "I never thought you could use such awful language or express such dreadful sentiments, especially about my only son; my one ewe lamb!"

"Your one what?" said the wicked Mr. Kingsford with a guffaw. "None of the blooming 'ewe-lamb' about Roy, thank God!"

Mrs. Kingsford burst into tears:

"And to thank God for such a dreadful thing!" she blubbered.

Mr. Kingsford grinned unrepentantly:

"There, there, old girl; don't cry! Roy's a man now, and he has to learn all the restraints of a man. You won't do him any good by trying to keep him away from temptation. He has got to learn to resist it; my dear—er—just as I had to and—er, did."

And he raised his eyes thoughtfully to the ceiling and pinched his leg hard.

Mrs. Kingsford dried her tears.

"I like you better now, dear John. Those sentiments are ever so much more worthy of a gentleman and a father;" and she made as if to rise.

But John Kingsford anticipated her, and was bending over her, patting her cheek.

"And by and bye," he went on, "like I did, he will find his guardian angel to protect him from the er—slings and arrows of—er—outrageous women—like I did."

Mama Kingsford kissed him, and then Bessie insisted upon doing likewise, and the deputation withdrew. He saw them to the lift, and then hurried into the office, and seized his hat, and five minutes later was in the saloon bar at the corner, telling a squirming friend the whole story.

* * *

Mr. Browne-Joynes had just finished a most unpleasant pair of interviews. His daughter, Violet, had angrily demanded that he should forbid her

step-mother to travel by the "Bunyip." She wished to avoid giving any reasons, but if forced to would, —with alacrity. Would her father exact a promise from his wife to that effect?

Her father did promise, and sought his wife. The lady flatly refused to bind herself as to what boats she should travel by. Who had dared to even insinuate such things? Her husband pointed out that nothing was insinuated—he merely asked her as a favor to give her word she would not travel on the "Bunyip." Then, she, too, took refuge in tears, and in the end he told her it was Violet's wish she should not travel by that boat. She demanded to be confronted by Violet, and a stormy scene raged, during which Violet accused her of having tried to flirt with Roy Kingsford, and of having kept herself and her sweetheart away from each other. All of which statements were flatly contradicted with counter charges of jealousy and a desire to rule the home in her mother's place. It was all very painful; and in the end the wife went to her room and wept; Violet did the same, and the banker went to his study and smoked and marvelled and cursed.

He was still cursing in a most fluent way for a banker when he was told Miss Bessie Kingsford wished to see him. He frowned at the name; but sent out word to admit her. Bessie entered, flopped on to rather than sat on the chair, and bit her lips. She explained she had come to say something very unpleasant, but it was for the good of both families; and so forth, etc. Mr. Browne-Joynes blinked hard at her, and then asked her was she acquainted with his daughter Violet. Bessie assured him she was not; had never spoken to her, but she thought her sister Mabel had. Then Mr. Browne-Joynes suddenly rose, shook her by both hands, pledged her to secrecy, and promised that his wife should not travel on the "Bunyip."

Hardly had Bessie departed when his wife entered the room; and before he could say anything announced that she had come to give her word not to travel by the "Bunyip." In her position she realised that she must absolutely avoid the appearance of evil, and if he wished it, she would take a chaperone with her. She was sure Mrs. Morgan Fairchild would come; and she was old enough for anything.

* * *

Mr. Browne-Joynes smiled bitterly. He seemed to be devoid of illusions about Mrs. Morgan Fairchild. He declared he had no wish for her to take a chaperone. He thanked her for giving way to his

request that she should not travel on the "Bunyip," and congratulated her on seeing things in the right light.

Friends and relations in Sydney saw Mrs. Browne-Joynes leave by the "Ancara," and wrote Violet and her father to that effect. What they did not see, however, was that the lady left the "Ancara" at Melbourne, and waited till the arrival of the "Bunyip" on which she booked her passage in the name of Smith.

And what she did not know was that the day she left Magnolia Town a wireless plant was erected on the top of the tall bank building. She was not aware that Violet had learned to operate and had wheedled the installation out of her father that she might keep in touch with the lover her step-mother was trying to steal from her.

On board the "Bunyip" the gracious ways and exotic beauty of Mrs. Smith made her a prime favorite, and soon won her the captain's permission to visit the wireless cabin, where a note previously sent along prepared Roy Kingsford for the change in the name.

She was considerably chagrined when she discovered she could not linger in the operating room. She was astonished at the way Roy seemed to live in the den. She nearly fainted when one evening Roy sent her a closed letter. But all signs of fainting vanished when she opened it, and found it was a message not from Roy, but her step-daughter Violet, to the effect that her husband had gone to Adelaide by rail to meet her. Here was a pretty kettle of fish. For once in her silly, self-fish life she was genuinely afraid.

At Adelaide she dodged him, for the simple reason he was not there to meet her. But when the steamer departed for the West Mrs. Smith was not on board. Before she left the steamer, however, she had a heart to heart talk with Roy.

Roy was straightforward and uncompromising.

"That's all over, Mrs. Browne-Joynes. Maybe, I have been a cad, but I can say that the woman tempted me. It might have been different, but Violet learned to operate, and has a little station of her own, and every day we talk for hours; and with her signals whispering in my ear always I have no time to think of anyone else. Your and my and Violet's future happiness has been badly endangered. The danger is past, and let us be content to be friends, and friends only. I shall always value your friendship!"

"Bah!" said Mrs. Browne-Joynes; "go to the devil—I—I hate you!"

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WIRELESS AND WAR AT SEA

By ARCHIBALD HURD

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Since the last great naval war was waged in Europe a century ago, remarkable changes have occurred in the construction of ships, in their defensive and offensive qualities, and in their auxiliary equipment. The principles of naval war are static, but their application has changed and is still changing. The object of hostilities is to defeat the enemy, and in order to effect this purpose it is desirable to know what the enemy is doing in this or that theatre, and to possess means of communication, which will enable superior power to be concentrated and exerted against him at the right time and in the right place. It is also essential that the power shall be of the right kind. Sometimes it may be necessary to employ battleships; on other occasions battle cruisers—that is, ships with the speed of cruisers and the gun power of battleships—may be more suitable, while in other circumstances it may be necessary to use scout cruisers, destroyers or submarines. The more complete and exact the information obtained as to the movements of the enemy, the better will be the arrangements for defeating him, providing the higher command is used with competency and sureness of purpose. It may be said that in war, almost everything depends on rapid and accurate intelligence.

The invention of wireless telegraphy has radically altered the intelligence service of the British fleet, as of other fleets. In former wars in which we have been engaged, communications between the admiralty and the admirals at sea and between the admirals at sea and the officers commanding different ships was slow, uncertain and often inefficient. The old system of intelligence may be illustrated by recalling the story of the errand of the brig *Curieux*. *Nelson*, acting on his unequalled intuition, had chased *Villeneuve* across the Atlantic, and on June 12th, reached Antigua to learn that the enemy had apparently started back for Europe. The British Admiral decided to send the *Curieux* to England with information of the enemy's movements and details of what he himself intended to do. Sailing at her swiftest, she did not reach Plymouth until July 7th. Commander *Bettesworth* posted at once to London, only to discover

that the First Lord of the Admiralty, Lord *Barham*, had gone to bed and no one dared rouse him.

"At an early hour," Mr. *Julian Corbett* states, in "The Year of Trafalgar," "the old man awoke and fell into a fury when he knew what had been awaiting him. For it was not only *Nelson's* despatches *Bettesworth* had to deliver, but having taken a more northerly course than the admiral, who was making for the Straits, he had sighted *Villeneuve* and determined his course. It was on June 19th as high as latitude 33deg. 12." and in longitude 58deg.—that is, some 900 miles north-north-east of Antigua—that he had seen him, and the combined fleet was still standing to the northward. Still there could be no doubt *Bettesworth* had shadowed them, and then made all sail home with his important news. That *Villeneuve* had stood so far to the northward, could only mean that he was making to the bay, and not, as both *Barham* and *Nelson* expected, for the Straits. What was to be done? In half an hour *Barham* had decided."

In three hours the orders of the Admiralty had been drafted and the commander of the *Curieux* was thundering down the Portsmouth Road to rejoin his ship, which had in the meantime moved round from Plymouth to Portsmouth. In a short time the brig again put out to sea, bearing with her despatches to *Cornwallis*, which had no little influence in changing the course of European history.

One can imagine how the admirals at sea and the members of the Board of Admiralty chafed under the delay which was imposed upon them owing to the slow means of communication which then existed. The *Curieux*, from the time when *Nelson* decided on his course of action until Plymouth was reached, was at sea twenty-four days. Then followed Captain *Bettesworth's* post to and from London, and further delay occurred before the vessel was able to complete the chain of intelligence by communicating with *Cornwallis*.

In the past hundred years, steam has replaced sail power, and movement by sea has thereby been rendered more rapid. On the other hand, except where cable communication exists, the navy of to-day would

still have to rely upon the same slow methods of communication as existed a century ago, were it not for the invention of wireless telegraphy. The relation between the speed of the enemy and the speed of the intelligence ship of the opposing fleet, is now much what it was in Nelson's day. Under the altered conditions, however, a wireless signal "in code," can accomplish in a few seconds all that the Curieux was able to do in many days.

Lack of efficient intelligence was under other conditions the bane of the lives of our admirals, as their letters reveal. When Nelson was blockading Cadiz, he had to maintain a chain of small vessels which stretched from the enemy's port to the main British Fleet, fifty miles away, and the news that the enemy had sailed did not reach him for two and a half hours. To-day a single scout cruiser, under steam, could cover that distance in an hour and a half, and no chain of repeating vessels would be necessary, and the enemy, instead of taking twenty-four hours to manoeuvre out of port, could complete the operation in one or two hours. Steam in the first place rendered possible a reduction in the number of links in the chain where great distances had to be covered, but it was not until Senatore Marconi invented Wireless Telegraphy that it became unnecessary to have any chain in any circumstances.

The marvels of yesterday are the commonplaces of to-day. We accept the triumphs of wireless telegraphy without surprise or wonderment. And yet how short is the time since this invention appeared, and how surprisingly have all the early anticipations of its triumphs been more than fulfilled. In this connection it is not uninteresting to recall the leading article which appeared in the "Times," as recently as August 17, 1899, on the employment of Senatore Marconi's system in the naval manoeuvres of that summer. It was remarked that "it has been demonstrated by repeated experiments, conducted under the conditions of actual service, that signals can be transmitted, received, and interpreted from ship to ship, up to a distance of at least thirty miles, and that their transmission is, so far as we know at present, unaffected by any ordinary meteorological conditions. Thus at a single stroke, all existing methods of signalling at sea would seem to be superseded and the effective range of signalling by night or day and in all meteorological conditions, is enlarged some five or six fold at least. . . . An electrical contact, alternately made and broken

at prescribed intervals, in any one ship, will project the required signal, by means of the familiar telegraphic alphabet of dots and dashes, to any other ship within a circuit of thirty miles. Communications with the



THE AERIALS OF A UNIT OF THE GREAT PATROL IN THE NORTH SEA.

land can be maintained at the same distance, and the signal, being automatically recorded, will require no exceptional acuteness of vision and no trained habits of nautical observation in the operator who receives it. A button pressed in the flagship will initiate any and every tactical evolution in the fleet, and ensure an almost automatic precision in the resulting movements of the fleet. The flashing lantern will be superseded at night, flags and the sema-

phore by day, or employed for the most part only as auxiliaries for the executive purposes and for the better discrimination of ships addressing and addressed. The hideous and often bewildering shrieks of the siren will no longer be heard in a fog, and the cumbrous, dilatory and very uncertain system of gun signals will become entirely a thing of the past. As the range of transmission appears to depend on certain determinate factors—such as the height to which the transmitting and receiving wires are carried and the intensity of the vibrations excited in the former—it seems not impossible that the determination of these factors may lead hereafter to an accurate and expeditious measurement of the distance between transmitter and receiver, thus superseding the sextant in ascertaining and correcting the stations of ships in a fleet."

If a means of signalling over distances of about thirty miles was welcomed by the "Times" nineteen years ago in a leader of a column and a quarter in length, how great must be the indebtedness of the navy to the new system when a squadron based on Malta can receive signals direct from the Admiralty by this new system, and when the ordinary installation of a large ship of the fleet can send messages over a distance of 3,000 miles.

When the new means of communication was in its infancy, installations were made only in battleships and large cruisers; the system was afterwards extended to small cruisers, later on to destroyers, and finally to submarines. The German under-water craft, which have played such a dramatic role in the present war, are provided with installations which enable them to communicate three or four times as far as could a battleship in the naval manoeuvres of 1899. This contrast supplies evidence of the remarkable development of wireless telegraphy in its adaptation to the uses of the navy in the last nineteen years. Practically every ship in the British navy to-day can despatch and receive wireless signals, and consequently the intelligence work of the navy has undergone a radical revolution. An admiral need never be out of touch with the Admiralty. The radius covered by his intelligence service is governed, not by the number of links in the chain of signal vessels, but by the character of the wireless installation. Admiral Sir David Beatty, in command of the Grand Fleet, can remain not only in hourly touch with the Admiralty, wherever he may be in European waters, but he can receive instant reports of any movements on

the part of any section of the enemy's navy from the patrolling squadrons.

In the matter of intelligence, the modern admiral is infinitely better served than was Nelson, whose continued cry was "more frigates, more frigates." In the year before Trafalgar, the navy possessed 244 frigates to 175 ships of the line, while in 1814—just over a hundred years ago, there were 317 scouting vessels and 240 heavier ships. A British admiral was never satisfied that he had with him sufficient frigates to watch the enemy's movements, convey information to him, and act as despatch carriers. In the opening year of the present century, with the advent of steam and iron ships, conditions had undergone a change, but still the admirals demanded "more cruisers." In the spring of 1900—eighteen years ago—the navy embraced 45 battleships and 126 cruisers of various types and sizes, and there were fifteen large armoured or protected cruisers building. At that date the other six naval powers had 52 cruisers in hand—France 14, Russia, Germany and the United States 9 each, Japan 8 and Italy 3. The introduction of steam and the development of the steam engine had conferred advantages of powers, great and small, and every country was intent on constructing cruisers. Of different types there were, built and building, 314 ships which could be used in scouting duties, though some officers held that many of the large cruisers, carrying the 9.2 in. gun, might also be employed in the line.

Wireless Telegraphy has since been developed to a state of perfection as a means of communication, which fifteen years ago would have been regarded as impossible. The whole world has become a whispering gallery, yet by "tuning" and the use of codes secrecy can be maintained, so that A and B, British ships, can talk without C, a German ship, being able, except by luck, in hitting on the "tune," or leakage of the code employed, to know what is the subject matter of their conversations.

What has been the effect of wireless telegraphy on cruiser construction? How many cruisers are building? No armoured or large cruisers—what in the past would have been known as "first-class cruisers"—are under construction in any shipyard for service under any flag. The only type of vessel in hand is the small scout, except in Russia, where, for an unexplained reason, six vessels of 7,600 tons displacement are on the slips. The vessels of the scouting type which are in hand in British or foreign yards, range in displacement from 3,500 tons, in the case of Austria-Hungary, to five thousand tons

in that of Germany; the British scouts, known as light cruisers, being of 3,800 tons.

The value of wireless telegraphy to the scout ship was most ably demonstrated in connection with the German commerce raider Emden. Within a few moments of the signal of distress being despatched from Cocos Island, the Sydney, of the Royal Australian Navy, was bearing down upon the Emden for the purpose of destroying her; and destroy her she did. Wireless telegraphy was thus responsible for the complete destruction of this most famous of all commerce raiders, but for Senatore Marconi's invention there is no saying when her career would have come to an end.

Wireless telegraphy has completely revolutionised the intelligence services of the Navy. An admiral need never be out of touch with the ships under his command. Success in war depends in large measure upon unity in command, and wireless telegraphy, when it has been fully developed, will contribute powerfully to this end. The Lords of the Admiralty, seated in Whitehall, will be in a position to signal to ships of war on the outermost sea stations. This facility of communication will add incalculably to the strength of the British Fleet. It will enable concentrations of force to be made swiftly to the disadvantage of the weaker naval power. Thus wireless telegraphy takes its place beside other scientific developments of the past few decades, in assisting the supreme naval power, and conferring upon it advantages altogether out of proportion to those enjoyed by the smaller nations. But for the aid which science has rendered, the British Empire would consist to-day of a series of isolated communities, each in danger of being surprised and isolated, as they were surprised and isolated in the past. In fact, however, the King's Dominions are being day by day brought into closer relation with each other and with the Mother Country. Wireless telegraphy is destined to become the nervous system of the British peoples; a signal of danger from any isolated community will at once result in appropriate aid being despatched. In this way, wireless telegraphy will enable the British Navy to utilise to the full the advantage of speed obtained by the use of steam.

Great as are the advantages which wireless telegraphy has conferred upon the Navy, its development is not unaccompanied by some disadvantages. The distinguishing character of the Navy in the

past was the initiative and resourcefulness of officers on distant stations acting on their own responsibility without reference to the Admiralty. The knowledge that owing to the new means of long distance signalling they possess instant means of communication with Whitehall, may prove a source of weakness. Attention has already been directed to this peril both in and out of Parliament. It has been suggested that the Admiralty may be encouraged to interfere unduly with the freedom of action of officers in distant seas. On the other hand, there is a danger that officers in the outer stations, confronted with embarrassing conditions, may be tempted to evade responsibility and await instructions from home. Both dangers exist, but probably the latter is greater. The Sea Lords in times of war have full reason to be conscious of the heavy responsibilities which rest upon them in the exercise of the higher command, and they are hardly likely to add to these responsibilities, and arrogate to themselves the right of decision on this or that minor point of policy. But a naval officer, realising the consequences which will fall upon him if he commits an error, may well be tempted, if he be lacking in initiative and resourcefulness, to seek direction from home instead of acting according to his own judgment. In both respects time will no doubt evolve suitable measures with a view to securing to the Navy the maximum advantages of wireless telegraphy with a minimum of disadvantages. Certainly nothing which has yet occurred, so far as is known, in the course of the war supports the belief that wireless telegraphy has proved anything but a great reinforcement of our naval power.

The Empire will not gain the full advantage of wireless telegraphy until further progress has been made in Imperial co-operation for naval defence. When the Empire obtains an Imperial fleet, subject to the control of one authority, then the Imperial wireless service will powerfully contribute to the security of every Imperial interest, wherever it may be situated. It was suggested when wireless telegraphy was invented, that it would rob the British peoples of the advantages which they had hitherto enjoyed from the possession of British-owned cables. It was urged that the least wealthy naval power would be able to take the fullest advantage of Senatore Marconi's invention, and that consequently our sea power would be robbed to some extent of the benefits in war time which it

had hitherto obtained from the control of most of the cable systems of the world. It is already apparent that this is a delusion; wireless telegraphy, owing to its length of reach and its rapidity, will reinforce our sea-power, because we are and must remain the supreme nation on the oceans of the world. When by the co-operation of the Dominions, and, possibly, of India, a great Imperial naval force has been created, wireless telegraphy will confer upon the supreme authority in control the ability, independent of the cable, to concentrate the

right force at the right place and at the right moment; and in this way the world-wide needs of the British Empire will be strengthened immeasurably. The wireless system is still in comparative infancy, and we cannot doubt that in the course of the next few years it will be greatly developed, and every stage of advance will mark a further strengthening of the naval chain which binds the Empire together, and secures its safety under peace and war conditions.

Thoughts on a Peace for the World

By R. G. GORDON

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In the previous instalment of his article Mr. Gordon explained his ideas of how a lasting peace for the world might be arranged.

The arrangement must include practically all the nations of the world, and each nation would supply a quota of the large naval and military forces which would be necessary. The forces would be located in positions remote from the possible control of any one nation, and the author suggested the selection of four islands to be used as bases, two to be occupied by the military forces, and two by the naval forces. He also described the arrangement for the control and maintenance of the naval and military population of those islands. Mr. Gordon's object in publishing his thoughts on a Peace for the World and how it might be maintained is to promote wide thought on the subject, in the hope that the attention of some of the most able persons might be secured, and that eventually the great problem will be solved. He does not suggest that his proposals as they stand are in any way practicable, but he offers them to the world for what they are worth. In the following contribution he outlines the difficulties as they appear to him, and brings his interesting subject to a conclusive end. Those who have not read the first contribution should obtain a copy of the April number of "Sea, Land and Air," and read the full context.

The difficulty of location would be overcome by placing the four units of the concentrated power on four islands away from the countries of the federated nations. It might be thought that by being so isolated the power could not be availed of promptly enough if occasion should require its use, but it must be remembered that the nations would be disarmed and that every country is being patrolled by international police, for the purpose of preventing any nation surreptitiously manufacturing weapons of war.

The difficulty of control would be overcome by all the institutions being of international character, and all the federated nations having representation on the councils of these institutions. Like, as with the people of an individual nation, the nations would have to abide by the decisions of the majorities in any matter considered by the international institutions.

By the international Parliament holding its sessions in rotation in the various countries, it would be a means of preventing unfair influence being brought to bear upon the members as might occur if it had a permanent location, and it would get more in touch with the people and opinions of the various countries.

This parliament should be conducted on the lines of a debating club more than on the recognised parliamentary lines. There should be a president or chairman, but no ministers or parties, otherwise it would become a bed of strife and intrigue.

The difficulty of keeping the concentrated power beyond the influence of any one nation or a combination of nations would be largely overcome by insular locations. The institutions, being of an international character would materially assist in this direction, as there would always be a certain amount of national rivalry that would largely safeguard the interests of each nation. By the mingling of the national elements of the forces, this rivalry should not become a danger, but it is more likely to produce a unity of interests and a national brotherhood among the garrisons, especially if one language was adopted. Then again the dividing up of the power into four units is another safeguard against corruption.

Now let us consider the possibility of a nation or a combination of nations endeavouring to secure control.

In the first place all correspondence with these stations is proposed to go through a board of international censors on each station, so any seditious correspondence would

come before the representatives of each nation on this board. As a further safeguard all intercommunication between these stations should have to go through another board of international censors, also insularly situated so the corruption of these forces would be rendered most difficult, and as the penalty for a traitor should be public disgrace and death, the initiating of a conspiracy would be a very dangerous thing.

Not only would intrigues have to be successful on the stations, but the international police would have to be bought over and it is to be remembered that these are changed in each country at short intervals and are international in constitution and the initiating of a conspiracy among them would also be very dangerous.

Again for any nation or combination of nations to be successful in obtaining control of the international power they not only would have to be successful in conspiring with the greater part of the insular units, but must be backed up by their people who would have to be prepared for such a venture, and it must be remembered that by the voice of the majority of such nation or nations they had joined the federation and any small party within that nation or nations conspiring to get control might betray the conspirators.

The risk would be enormous and for one nation to tempt another nation to conspire to obtain control would be even more risky, and beyond the penalty meted out to the individual conspirators. There should be a severe penalty imposed upon the nation or nations attempting to secure control of the international power, should the conspiracy be found to be deep rooted in the nation or nations, and such laws as those outlined, would compel a nation to transfer the support of its population at the back of any conspiracy, but also to have to surreptitiously establish factories to manufacture equipment in the face of the patrolling of their country by the international police.

It is barely possible for any conspiracy to succeed against all the safeguards.

The dividing up of the power into four separate units, each insularly situated and with the means of communication through an intermediate international censor station, each station having also its only course of communication through its board of international censors makes the possibility of conspiracy almost impossible, and so dangerous as to cause a conspirator to pause before attempting it, especially as there should be no amelioration of the death penalty for all connected with any attempt.

The purpose of limiting the supplies at these stations is another safeguard, because before this power or any portion of it could become a menace, it must have a base of supplies.

Of course if a number of conspirators were able to overcome the difficulties of intercommunication and the separate international interests of the various representatives of the nations in each or the majority of these stations, a circumstance most unlikely, and having control of the whole or the greater portion of the power, they would have no difficulty in obtaining supplies from the mercantile marine of the nations, and no doubt would be able to induce one of the nations to join them.

But before such a state of things could be brought about, it is more probable that there would be internal trouble in some of the stations as there would be certainly some loyal elements.

To prevent any body of men of one or two nationalities being segregated that might develop a unity of purpose for conspiracy, the crews of the vessels and the companies to man the forts should be of as mixed an international character as possible.

The naval units without the military units would first have to reduce the forts and pass through an extensive minefield before they could get supplies of ammunition for their stations, only very limited quantities would be accumulated.

The military units should have supplies sufficient to hold out much longer than the naval units, so that in the case of a siege they would have the advantage.

Should the naval units raid the mercantile marine, they would still require munitions, and at each military station a number of dismantled vessels could be stationed so that a naval power to cope with the disloyal naval units could be quickly created.

The purpose of having these vessels dismantled would be as a safeguard against these stations attempting to gain the power.

It will at first sight seem that these vessels being within the reach of the military units, would be a grave danger, but it must be remembered that these stations have only a limited amount of supplies of food, and they would also have to reckon with the naval units having unlimited supplies of food and raw materials, also factories for the manufacture of arms and munitions. The supplies in such a necessity would be obtainable from the federated nations, and by the time the insular units could have their boats in fighting order, they would be under siege by the naval units.

Again supply ships would be visiting the stations at short intervals and another safeguard could be established by these vessels carrying boards of international officers for the inspection of the stations. These officials would immediately report any breach of the regulations, so that any attempt to prepare the dismantled vessels without authority would be quickly detected.

Or a service of small patrol vessels of high speed could be maintained for the board of international inspectors to make frequent surprise visits.

To further add to the difficulties of successful conspiracy, it would be advisable to have no wireless communication with the stations, so that the communications would be under perfect censorship.

The Islands.

The islands should be kept for naval and military purposes only, no commercial or trading interests should be allowed, or any communication otherwise than through the official channels.

The supplies should be drawn as much as possible, and as equitable as possible, from the whole of the federated nations, and could be under the control of an International Supply Board, who might obtain the supplies by tender.

If stores are established for supplying the families of the officers and men, they should be run under official control.

No increase of population by immigration should be permitted, and from the families of the members of the garrisons the strength of the units should, as far as possible, be maintained. The balance of any increase necessary should be arranged in such a way as to engender an international spirit.

By keeping the garrisons to their normal strength from the local born they would eventually lose their cosmopolitan character and tend to a unity of interests and feelings.

Initiatory Difficulties.

As a scheme is the first problem to be solved, a scheme has been outlined, and the author has presumed to show how the difficulties of maintaining it might be overcome, but there are initial difficulties also to overcome.

There should be but little difficulty to get a preponderance of the national powers to appoint members to an International Peace Congress. That is the first move in the propaganda and it is also essential to agree to contribute the amount required by the Congress for awards for the best suggestions

from which a scheme could be drawn up.

Should the first scheme formulated by the Congress not be accepted by the Governments of the preponderance of the national powers, after all suggested amendments have been considered, it would be necessary to revise the scheme until such acceptance could be obtained. In the event of no such result being obtained, the latest scheme or then submitted by referendum to the peoples and if accepted by them it should be established.

Should a number of the nations hold aloof, or show an antagonistic spirit, but still a very large proportion of the national powers be in favor of submitting the scheme to their peoples, they should then bind themselves by treaty to place upon the commerce of the dissenting nations such a prohibitive tariff that would materially affect their trade relations with the nations that have accepted the proposal to put the scheme to a referendum of their peoples.

No doubt it would be against the interests of some of the nations to agree to such a proposal, but they have to also consider the benefit that will accrue to them by such a thing as a lasting peace, and their peoples should have the right beyond their governing bodies, to say whether they will accept the scheme or not.

Should a scheme be accepted by a preponderance of the national powers, they should, by treaty, practically shut out of their territories the commerce of the dissenting nations and eventually force them into the federation. This may seem a drastic measure of coercion, but if a majority of the nations of the world have agreed to a scheme to establish a lasting peace, the other nations should bow to the decision of the majority, unless they can show that such a scheme unjustly treats them.

After the war the belligerent nations can only recuperate through their commerce and any of them placed at a disadvantage by prohibitive tariffs against them must have a much harder fight to regain naval and military strength.

Should a considerable number of the nations be federated for the purpose of securing a lasting peace, and erect such a barrier, they will drive in the wedge to force the whole of the nations into the federation, and before the dissenting nations could break down this barrier, they would have to be a match in naval and military power for the whole of the federated nations.

Internal Strife or Civil War.

A lasting peace should not only be a peace

between nations, but should be the means of preventing civil wars.

The international Parliament being established to prevent war, should be an arbiter to which any section of a nation could refer any case of alleged oppression that was likely to bring about civil war and the award of the international courts upon such cases could be enforced by means of the international power.

Likewise massacres such as the world has seen repeated at frequent intervals among the poor ill-fated Armenians, could be largely prevented, as the most dire punishment could by means of the international forces be meted out to the perpetrators.

It may, to many seem, that the author is struggling to bring about the millennium, yet is there any reason why we should not reach a state of civilisation that would include an assured world's peace?

If a nation will risk its existence in sanguinary wars of conquest, how much more eager should its people be prepared to devote its energies to the purpose of bringing about such a result without further bloodshed? No doubt they are eager and willing if they were not bound by lustful, avaricious, arrogant leaders.

Wake up such peoples to a true sense of freedom and the way to a lasting peace is well advanced.

Why Not?

Could not a scheme that would eventually bring about a world's peace be made the means of ending this awful struggle and save civilisation from further sacrifices and degradation.

If the Central Powers are desirous of peace, as they are reported to be, and were earnest in their note to President Wilson in reply to his famous peace note, wherein they say, "the work of preventing future wars can be begun only after the present war is ended, when Germany will be ready to collaborate with the United States in this exalted task," do they not mean that they are only waiting for victory when they will be able to secure peace by their own might, should they not now be prepared to consider a scheme such as would probably prevent war in the future.

Should such a scheme be possible, it would be the ending of Prussian militarism, yet it would not crush it in the sense that the Allies intend, for with the ending of Prussian military power under such a scheme, would also come the ending of all individual national forces, military and naval, and the ending of Prussian military power would,

under such circumstances, be no disgrace to Germany, indeed her acceptance of a scheme would go largely toward reinstating her among the civilised nations of the world.

I venture to say that if it could be referred to her people by referendum, the war would soon be over, but no doubt the German people must first be taught the meaning of the word democracy.

Conclusion.

As we shall never feel safe again under any international law or treaty with the nations individually holding the powers to enforce them and as the history of the relations between nations has in the past been that of "friend to-day and foe to-morrow," it is evident that without a scheme for a lasting peace, we must, after the war, still shoulder the burden of immense armaments to ensure our independence and liberty. Therefore, knowing that we should derive such benefits from an assured lasting peace, is it not to the interests of every individual to turn his thoughts to this great subject, and do his share towards bringing about the desired result?

In conclusion I would ask one and all to add their quota, however meagre it may be, to **THOUGHTS ON A PEACE FOR THE WORLD AND HOW IT MIGHT BE MAINTAINED.**

THE VALUE OF CONFIDENCE AND A BROAD OUTLOOK.

When men grow accustomed to dealing with one another on the basis of mutual confidence instead of by pure bargaining, the best results are obtainable if both parties are blessed with a broad outlook.

A recent instance clearly illustrates the above syllogism. A certain yacht club required a motor boat for use as a tender. Instead of seeking the cheapest builder, the club's representative called in the manager of a firm from which he was confident of obtaining the highest quality at a fair price. When the estimated price was submitted, the yacht club's representative instructed the builder to add two hundred pounds to the price and produce the best class of boat that could be built.

Such procedure would be incredibly foolish in the absence of mutual confidence, and a broad outlook on both sides. If those conditions exist, however, it contrasts most favorably with the common practice of tying a contractor down to the minimum figure, so that he takes all risk of loss and if unscrupulous seeks for methods of giving inferior quality in disguise or of charging for extra items, which should be included with his contract even if not expressly stated.

The scarcity of the broad policy cannot be charged against either the purchaser or the contractor individually. The second method is but a few stages above the native bazaar principles of Oriental people.

THE SCIENCE OF NAVAL ARCHITECTURE

In a deeply interesting paper read before the Franklin Institute, one of the foremost institutions of its kind in U.S.A., Mr. Taylor (chief of the Bureau of Construction and Repair in the U.S. Navy) traced the progress of ship designing from the eighteenth century to the present day.

The art of shipbuilding was undoubtedly developed at a very early stage of the history of the human race. The earliest record of a ship, as distinct from a boat, canoe, or other small craft, is found in Egyptian carvings of a date about 300 B.C. But the science of naval architecture, like so many other branches of science, developed slowly, this science, as now accepted, being mainly a development of the last hundred years, almost, say, of the last fifty years.

The famous Swedish Naval Architect and Shipbuilder, Henry de Chapman, published a treatise on shipbuilding in 1775. As late as 1820 Dr. Inman, the head of the Royal Naval College and School of Naval Architects in Portsmouth Dockyard, England, published a translation of Chapman for the instruction of English students of naval architecture. Chapman's work, so far as it deals with the science of Naval Architecture, consists largely of empirical rules, although it was far in advance of his day, and much of it is still applicable to sailing ships. In some respects his ideas were largely erroneous, an example being his theories regarding resistance of ships. In fact, it was not until a hundred years after Chapman's time that the science of naval architecture was enriched by sound theories concerning this important branch.

Dealing with the sailing vessels concerning which Chapman wrote, Ruskin said:—

“Take it all in all, a ship of the line is the most honorable thing that man as a gregarious animal has ever produced. By himself, unaided, he can do better things than ships of the line; he can do poems and pictures and other combinations of what is best in him. But as a being living in flocks and hammering out with alternate strokes and mutual agreement what is necessary for him in those places to get or produce, the ship of the line is his first work. Into that he has put as much human patience, common sense, forethought, experimental philosophy, self-control, habits of order and obedience, thoroughly wrought

handiwork, defiance of brute elements, careless courage, careful patriotism, and calm expectation of the judgment of God as can well be put into a space 300 feet long and 80 feet broad, and I am thankful to have lived in an age when I can see this thing done.”

This is what Ruskin thought and wrote years ago of the ship of his day. His words are even more true of the ship of our present day and generation. His 300 feet of length has trebled, and the size of such a ship, as measured in terms of weight, has grown ten times. These modern ships have been made possible by the development of the science of naval architecture. This science, alone and unaided, without parallel development in practically all of the arts, sciences and trades, could not have produced these ships; but, so far as the ship itself is concerned, all the great progress in every branch of science and industry could not have produced this concentrated embodiment of human intelligence without the development and advancement of naval architecture or the theory of shipbuilding, a branch of applied science which calls upon and draws from an exceptional number of the arts and sciences.

The modern battle cruiser, whose building is just being undertaken in U.S.A., is an excellent example of the mutual agreement and co-ordination necessary between all the arts and sciences in the work of the naval architect. These vessels will be of 35,000 tons displacement, and will be capable of a speed through the water of some 35 knots, or a little over 40 statute miles per hour. To drive this mass at this speed, there will be required a machinery installation capable of delivering 180,000 horse-power. The vessels are 850 feet in length; they will carry ten high-powered fourteen inch guns as a main battery, with the addition of a large number of guns of a smaller calibre, to say nothing of the torpedo tubes.

Let us consider very shortly a few of the sciences involved when we undertake to build such a vessel. It is hardly necessary

to say that this undertaking would not have been necessary without the slow, steady development, through the ages, of the various theorems of pure mathematics, which, in their applied forms, have been necessary to material progress in the various branches of engineering. In addition to its general application mathematics has made possible the modern systems of control of the firing of the great guns, which permit them, with a considerable degree of accuracy, to drop a shell weighing a ton, on a comparatively small target, at a distance of from 12 to 15 miles. This accurate control of fire is based largely on instruments or mechanisms which permit the instantaneous solution of problems containing as many as half-a-dozen variables. Likewise, these ships could not be possible without the aid of astronomy, for it is through the development of that science, and through the experimental results made possible by it, that the various navigational instruments can be utilised to permit a sure and safe passage of the ship from one point to another.

Chemistry has played its part, not only in its general contributions to all engineering progress, but also in its solution of specific questions and difficulties, such as are involved in the manufacture of propellant powders, and high explosives in forms that may be safely handled and carried on such a vessel until the selected moment for turning loose their destructive forces. Chemistry also, through its particular manifestation in the form of metallurgy, has played one of the most important parts by providing numerous varieties of steel, ferrous alloys, and non ferrous metals, which are used in the various parts of the ship and its equipment, many of these having been developed solely for the use to which they are put in such vessels as these.

Physics, in its various branches, has played a prominent role. In optics it has given us the theories of and has made practicable the various instruments which, in conjunction with fire control systems, make possible the accurate firing of guns and torpedoes, without which such a vessel would have no *raison d'être*.

Acoustics has played its part in the solution of many particular problems and difficulties, for, in the same way, that co-ordination has been carried out in constructing the ship, the most complete and harmonious co-ordination of all parts of its

organisation is necessary in her hour of trial by battle. This is rendered possible only by the most perfect means and instruments of communication throughout all parts of the vessel. These systems of communication must be such that they will not break down in the midst of the noises and confusion of battle, or because of the high mental tension, at such times, of the personnel using them.

The sciences of physiology, medicine, and hygiene must likewise play their parts, for during the long years of peace, each of these vessels must be the healthful, and, as far as possible, the happy home for anywhere from 1000 to 1500 men. This means that what we term in the Navy "berthing and messing" facilities, or what in civil life would be referred to as the "housing and feeding" conditions, must be based on the most modern scientific principles. Likewise, to ensure efficiency in battle, the design must take careful cognisance of what these sciences have taught us as to the limitations of human endurance when working at high pressure under adverse conditions. Nor do we stop at this point, for there is provided, in addition, a completely equipped medical establishment, or hospital, including operating rooms, isolation wards for contagious diseases, special examining and treatment rooms, dental facilities, etc.

Without further enumeration of the many other branches of science and engineering which necessarily enter into the design of one of these great ships, let us consider more closely the principal branches of naval architecture proper. This is, broadly speaking, the division of engineering which enables us to make use of accumulated progress and knowledge to produce one workable and efficient assembled unit in the form of a ship. Its branches closely parallel the primary operations necessary in the design of such a ship as has been described. Given the fundamental requirements of the design, which in the naval service we term military characteristics, and which consist of a brief statement of the results which it is desired to obtain with the completed vessel in service, it is first necessary to make an estimate of the size of the ship which will permit a solution of the design problem. The first estimate or approximation must be based largely on previous practice and experience. Before the development of naval architecture, in its modern sense, the

necessity usually involved rather slow step-by-step progress from one ship to another. Naval architecture has now taught us how to make these steps much greater, so that during the last quarter of a century advances which would have been bold to rashness at an earlier time have become almost routine. The rule of step-by-step progress referred to above has at least one remarkable—we may almost say astonishing—exception. Some 65 years ago a famous civil engineer and bridge builder turned to shipbuilding. Maintaining that the larger the ship the more economical and efficient her operation, Brunel attracted large capital, and in association with Scott Russell, the shipbuilder and naval architect, finally produced the Great Eastern, which was indeed a giant by a pigmy when compared with the other iron steamships of her day. Her keel, laid in 1854, launched in 1858, after many difficulties, and put in service in 1859, the Great Eastern was not a commercial success. She fell short of the expectations of her designers in many respects. The successful completion even in five years of such a vessel was truly a remarkable accomplishment, but her size was ahead of her day, and it was not until 1899 that we find it again reached. As already stated, progress is more rapid nowadays than heretofore, but even now naval architecture would hardly enable us to take, with confidence, such a leap as the Great Eastern promoters undertook.

When in the early stages of a design we have, based on previous practice and experience, reached a first approximation to the size of the vessel, it is next necessary to examine in detail the problems of strength, stability, resistance and propulsion of the ship. These represent broadly the main divisions of our subject. Naval architecture, as a whole, and its branches, like engineering generally, has not yet become an exact science, and in some respects it appears impossible that this will ever be attained. The strength and stability of ships, for example, should be such as to enable them to withstand, under all conditions, the waves of the sea, but the latter are infinite in variety, and the attempt must be to provide for any manifestation arising from this variety. It is, therefore, not possible in a new problem to lay down an exact condition of water surface, and say that if our ship can stand this condition it can stand all others. The best we can do is to make an approximation of the

most severe condition based on previous accumulated experience, and observation. There have been made many thousands of observations on sea waves, but there is yet no complete agreement in regard to their limiting characteristics, such as length, height, and the relations existing between these dimensions.

About the middle of the last century, Rankine gave us the first complete mathematical theory of the formation and character of the waves, known as the trochoidal theory; his result had, however, been largely predicted by Grestner more than sixty years before. Although Rankine's theory does not explain, and is not entirely consistent with all phenomena of this nature, it is generally accepted to-day as a reasonable and convenient approximation of the facts, and it is usually upon stresses due to waves such as result from Rankine's theory, that we have our determination of strength of vessels.

We find that from the very beginning of practical shipbuilding, the problem of strength was recognised in concrete form, for in the very first ship of which we have historical record, its picture shows what we now term a "hogging" girder, which was provided to take the strains resulting from the variations between distribution of weight and distribution of buoyancy. It was the existence of these strains, and the fact that they increased with increase in length of ships, that operated to limit the length and, consequently, the size of ships during the era of wooden shipbuilding, as it was then, and still is, impracticable to develop the full strength in end connections between contiguous wooden members. The introduction of iron and steel, in conjunction with the development of methods and mechanisms for rivetting, has made the modern ship possible. For many years the provision of the necessary strength depended largely on rule of thumb methods and step by step development from one ship to another. Such steps, of course, led, in the majority of cases, to one of two results. Either deficiency of strength, or excess of strength. For any structure erected on shore, the latter fault is not necessarily a serious one, except from the point of view of cost. On a ship, however, too much material is almost as grave an error as too little, for every ship is built to perform some distinct service, and, as a floating body, can carry for all purposes only the equivalent of the weight of water which it

displaces. Every pound which goes unnecessarily into the structure of the ship itself is a dead loss to the aim or object for which the vessel is designed. The modern theory of longitudinal strength for a vessel, as based on many years of observation and experiments, has its origin in the simple fundamental theories of strength of beams or girders. The ship's structure, as a whole, is considered as a built-up girder with upper and lower flanges and connecting webs. This girder is assumed to be supported on a wave of length equal to that of the ship. The height of this ship is assumed to have various relations to its length, depending upon the magnitude of that length, but for the majority of cases this relation is taken as one to twenty. This girder is then assumed to be supported in a manner represented by the buoyancy curve of the ship when floating upon such a wave. The form of this buoyancy curve will, of course, vary with the position of the ship in relation to the crest and hollow of the wave and in important strength calculations it is redrawn for at least two, and sometimes as many as six, positions. The loading of the girder is represented by the loading of the ship, including its own weight, that of permanent installations, such as propelling machinery, etc., and that of the variable or useful load carried. By successive integrations and the use of the simple beam formula we then arrive at the figures representing stresses and strains in the theoretical girder. Some experiments have been made from time to time, notably those of Biles in 1908, to check the accuracy of the results obtained by this method, but due to the cost and magnitude of such experiments, there have never been collected sufficient data to enable us to say how accurately these results do represent the actual stresses in the ship in service. Accordingly, we are still largely dependent on comparing the figures obtained by this method for the new ship with those obtained by the same method for previous ships that have shown adequate strength in service.

Possibly due to the fact that our standard wave is not so steep as waves having the length of short ships, and steeper than waves having the length of long ships, it seems to have been thoroughly established by experience that, with the method outlined above, it is safe to allow larger stresses in large and long ships than in short and small ones. If, for instance, we find that by this method a small vessel in

service shows satisfactory results when her figured standard stress is, say, six tons in compression and eight tons in tension, and shows indication of weakness if these figures are materially exceeded, we would find that also in service a very large and long ship would show no signs of weakness with calculated stresses as high as ten tons in compression and twelve tons in tension. This principle appears to have been acted upon, though the scientific principles underlying it were not fully understood, even in the early days of iron shipbuilding. This was brought out about fifty years ago, when our modern methods of figuring strength were first applied to ships built in accordance with the then existing rules of the classification societies, with the result that the large ships of that day were absolutely in accordance with the then existing rules of the classification societies, with the result that the large ships of that day were found to have indicated stresses in extreme cases nearly five times as great as those found in small ships.

There are, of course, a very great number of strength problems involved locally in ships themselves, and, therefore, particularly within the province of naval architecture, but these are, after all, secondary when compared with the problem of the strength of the main structure.

We must be free or die, who speak the tongue
That Shakespeare spake, the faith and morals hold which
Milton held.

—WORDSWORTH.

Not once or twice in our rough island story,
The path of duty was the way to glory.

—TENNYSON.

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Honours of War

By G. R. Samways.

"Of course," said the sergeant-major, glancing down the avenue of faces at the mess-table, "I never did hold with these fellows who have jumped to the rank of sergeant without having a wing, or half a wing, or a decoration of any sort. I always think there must be a screw loose somewhere."

The occupants of the sergeants' mess nodded assent. Nearly all of them had put up a good innings in the great game of war, as their various decorations testified. Pilots' wings were conspicuous; and the sergeant-major himself sported the South African Medal, the observer's badge, and the Military Cross. The last-named had been awarded him at Buckingham Palace only a week previously, so he had every reason to stand on a pinnacle of glory and flash down fire upon less fortunate comrades.

"A good deal of water has flowed under the bridges since August 4, 1914," remarked Standish, a gunner observer of some repute. "A fellow who hasn't made good in that time ought to be kicked." There were only two sergeants present who, by reason of this remark, came under the category of footballs, and one of these was awaiting discharge through ill-health. The satire was not intended for him, and he knew it, passing it by as the idle wind. The only other undecorated sergeant was a new arrival at the camp. He was good-looking in a way—not that looks counted for much in the sergeants' mess—but his rig-out was atrocious. He wore a universal tunic several sizes too big for him, and his putties seemed to start at nowhere and finish in the same place. One of his boots was black, the other brown; and neither was a thing of beauty and a joy for ever. He had a heavy moustache, too, though he could not have been more than twenty-five.

"I think," Standish went on, laying down the law, "that no fellow should be given an instructor's job in the Flying Corps unless he has been through the mill. Most of us here are crocks. Our medical categories hover somewhere near the end of the alphabet. 'Unfit for further flying,' 'Light duty only,' and all that sort of thing. And yet"—he looked hard at the new arrival—"some chaps seem to be able to wangle things."

The sergeant in the universal tunic proceeded calmly with his breakfast. He was seated at the end of the table, apart from his fellows. Their rather hostile attitude towards him did not seem to weigh heavily upon his mind.

Standish, who was accustomed to the lion's share of the conversation, continued to give tongue.

"Some bounders," he said, "haven't even been overseas."

"It's infamous," said the sergeant-major.

"Just think of it! Three years kicking one's heels at home."

"Rather ripping," said the newly-arrived sergeant, looking up from his plate.

Standish, glad of an opening, looked at the speaker in his finest get-off-the-earth manner.

"Have you been overseas?" he asked, pointedly.

"Oh, yes!"

"For how long*"

"A month."

"A month? Great pip!"

The look of disgust on the face of Sergeant Standish was almost comical. He made no further attempt at conversation with the newcomer, but addressed himself to the audience at large.

"Talking about promotion, deserved and undeserved," he said, "I remember there was an awfully plucky little beggar in my squadron in France. Tommy Towers his name was."

"Observer?" said the sergeant-major.

"No; a pilot—full-fledged. Had as gentle yet sure a touch as anyone who ever piloted a 'plane. And his nerve. Gee! it was colossal."

Standish lit his pipe, puffed at it meditatively for a moment, and resumed.

"Ours was a fighter squadron," he said. "First-rate machines, tip-top officers, and tons of esprit de corps. One felt it was good to be alive."

The mess was respectfully interested. Standish talked a good deal, but was never regarded as a bore.

"Tommy Towers came to us as an N.C.O. pilot. He could have had his commission as easy as winking, but he preferred to remain where he was. Perhaps he thought he'd be a square peg in a round hole as an officer. He was a man's man, you see.

"Moonlight raids were in full swing when Towers turned up. We revelled in 'em. Every moonlight night we played Old Harry with Fritz's ammunition dumps or suspended the traffic on his railways. And Tommy Towers was never out of the picture. He'd taken to flying like a duck takes to water, and the guns and gears never tied him up into knots. He knew his job.

"Well, when he'd been out about a week his observer was done for. A couple of bursts of enemy machine-gun fire did the trick. Tommy got off scot-free. After that I became his observer. We had our fill of adventure, too, I can assure you!"

Standish paused. His eyes were aglow with the joy of battle.

"We got mixed up in all sorts of scraps," he went on.

"Invariably we were outnumbered, but we won through. And Tommy Towers always had a smile at the most breathless, nerve-racking moments. He'd have laughed through a howling wilderness.

"Tommy began to be looked upon as a coming man. The C.O. called him a blithering idiot for declining his commission. Said it would give more power to his elbow. But Tommy argued that life had other attractions than a Sam Browne belt.

"Well, the grand finale came when he'd been out there a month. It was early morning, and we'd been detailed to visit a Hun aerodrome which had developed into a perfect hornet's nest. Tommy was crazy keen, of course; and his keenness increased when, without much warning, we came up against a Hun formation.

"We hadn't a dog's chance, really. My beastly gun had jambed, and before I could remedy it the Huns got busy.

"By gosh! It simply rained fire. Every second I expected to go to glory. I thought Tommy would turn tail—there would have been every excuse for him to have done so—but not he! He headed straight for the brutes, fearless as you like, and then I got my gun going.

"We accounted for a couple of Huns in as many minutes and then the pace got a jolly sight too hot for us.

"But still Tommy wouldn't budge. He meant to see the thing through as far as it was humanly possible. We kept blazing away and two more of the pests were driven down out of control.

"Then our own 'bus began to lurch a bit, and we didn't relish a forced landing on enemy soil. So Tommy—he hated it from his soul, I know—turned her back, and the Huns poured in a farewell burst.

"Towers was indomitable—simply great! We got back to the aerodrome very much the worse for wear, but bearing our blushing honours thick upon us, so to speak—and then Tommy collapsed. He went down in a heap; and when the Medical Officer arrived we found the plucky kid had been shot in the shoulder and wrist—pretty badly, too. And he hadn't breathed a word about it!

"They took him away to the Field Hospital. He looked like a man who's jolly near the border; and I never saw him again, so I can't say if he pulled through or not. I came back to Blighty myself two days later."

The sergeant-major, forgotten his honours and his dignity and dropping back into his old natural manner, gazed thoughtfully through a haze of tobacco smoke.

"I should like to have met Towers," he said, simply.

"He was one of the best," said Standish. "He deserved the D.C.M., though whether he lived to get it or not is another matter. Anyway, I've proved my point. No sergeant should be given an instructor's job in Blighty unless he's been through the mill."

There was a long pause. All eyes were turned upon the new sergeant.

Hadn't the fellow any sense of shame? Didn't he feel small and mean and petty in the face of Standish's story?

The stranger was smiling. Contempt, it is said, will pierce the hide of a tortoise; but he seemed impervious to it.

The silence remained unbroken. Then the door of the mess was thrown open and an orderly entered. He went straight up to the new sergeant and handed him a bundle of khaki.

"Your tunic, sergeant," he said. "It arrived from France this morning."

"Thanks. I was sent over in the dooce of a hurry and had to wear this universal thing pro tem."

So saying, the sergeant rose to his feet, ripped off the wretched garment which had hung like a sack upon him, and donned the tunic the orderly had brought.

The occupants of the sergeants' mess gasped like a set of newly-landed fish. For the barrenness of the khaki tunic was relieved by the following decorations:—

Pilots' wings, pair, one; wound stripes, two; D.C.M., one.

Standish leapt to his feet. His eyes were gleaming.

"Who—who the merry dickens are you?" he demanded.

The hero's smile expanded.

"My hideous tunic and the fact that I've grown a moustache kept me from recognition," he said.

"Your name?" rapped out Standish, turning hot and cold.

"Towers, my boy—Sergeant Tommy Towers."

A sudden hush fell upon the sergeants' mess. Standish faced round upon his comrades, feeling like an obscure infant aged two.

"Kick me," he implored—"hard!"

And then, no one-taking advantage of the invitation, he turned, and availed himself of Tommy Towers' outstretched hand—"Aeronautics."

From the Mercantile Marine to the Germans.

Ere Bessie's ships had left the slips or Drake stood off the Hoe,

Or fighting Blake his whip did take to bid the Mynheer go,

The little things of sticks and strings our fathers called their boats,

Had steered the seas and felt the breeze wherever timber floats.

Yeoman, bowman, seaman, gleeman—the salt is in the breed,

And we were a race of sailors ere the Teuton heard the Creed.

You made yourselves a navy close-copied from our own,

Spoon-fed on pious moonshine by the Prussian on your throne;

Though you ape our crafts and customs, our discipline and ships,

You taught yourselves to murder with God's name upon your lips.

An imitation empire you had got by guile and gold,

You kultured hapless natives till they did as they were told;

You paid your greasy money down to buy colonial mud,

Not like we foolish Britishers who bought ours with our blood.

You call us "island shopkeepers" intent on pelf alone,

Yet some Briton dived with Death—for sport—where'er our flag is flown.

The German plays to win the game, to lose he counts a blot,

But the glory of a Briton is to lose like Captain Scott.

When to the south from harbour's mouth your first sea-traffic crept,

It owed its luck to British pluck, for we the track had swept.

The pirate crew, and slaver' too, the derelict and reef,

We hacked 'em down, we tracked 'em down, for such is our Belief.

We pioneered the ocean to the ends of all the earth,

For we were a race of sailors ere your empire had its birth.

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The Human Factor in Engineering

Everyone is aware of the increasing interest shown by employers and employees in the human problems surrounding the allied questions of efficiency, maximum output and personal welfare. The keen thought and the amount of discussion now being applied to such subjects will assist greatly towards a solution of the many difficulties.

The following is a contribution, which will interest a large number of people.—Ed.

The business of an engineer is to deal objectively with various problems; his training consists in the acquisition of knowledge to this end. Curiously enough, the subject of labor is later to become almost the dominant and possibly the most troublesome of all his cares. Starting with the belief that his main object is the production of mechanism from material, he finds that, as time passes, he is much more concerned with finance, labor, and the human factor—commercial or manual. He becomes more an administrator than a technical executive, realises that selection of subordinates and the will to work of his staff—both psychological problems—are more potent matters than even organisation and purchase of material. Human muscle—that is—its external appearance—is easily viewed, but the intelligence and capacity which, after all, animate it, are not so readily assessed. Capital and labor associated with system and organisation—the marriage of credit and muscle—is too often superficially assumed to be a profit-making co-partnership. Provided sufficient of either is available, there should be little difficulty in earning dividends seems a usual view. The human factor, however, permeates the entire structure, and unless duly assessed and rightly placed, the anticipated profits may vanish unaccountably into the air. It is too little realised that while share capital is definite, each human unit is a separate personal identity afflicted thereby with common human disabilities.

In actual practice there is only one penalty for failure or infraction of discipline—dismissal. On the other hand, no firm can afford to deprive itself for a trivial cause of the services of a potential profit-earner; it would suffer a greater loss than that immediately realised, as change disturbs the poise and balance of the machine. The power of inflicting the extreme penalty is therefore more or less judicially exercised; first thought is often tempered with

discretion; the outcome is that the two things—power and penalty—tend to equate each other. The man is kept in check by knowledge of the penalty, the management, knowing the difficulty of adequate replacement, is none too ready to use its privilege. Fear on both sides helps to keep each other virtuous. Technical troubles are apt to cause less serious problems than the human factor. It is an incomparable asset to be able without resentment to get the most out of a working force; to possess the knack of so doing is not a common quality. To diagnose the slacker may be easy, to understand why he slacks not so simple, to apply the correct remedy more difficult still. It is safe to say that a policy of bluff or blackguardism is as likely to be wrong as continuous nagging or fault finding. To handle an awkward case by tact and firmness, by the hand of steel in the glove of velvet, requires experience no less than the natural ability. Some men possess this happy faculty, which keeps a sore place from rankling. To drop heavily on the wrong man, or for the wrong matter in the wrong way, displays a want of judicial insight, and is fraught with disastrous results to output. A man flagrantly caught out will suffer remarks and feel their caustic justice without subsequent resentment. To use the same method for purely accidental fault is to invite shirking. We are, after all, each a member of a common human family, and whatever station we occupy our feelings are roughly equal. Any method whereby effort is induced is an end in itself worth consideration and some thought.

In normal times men often are hired, tried and fired, at the wanton caprice of a technically capable but otherwise ill-equipped individual, because an excess supply of labor is available. With a restricted supply an explanation of the touchiness of labor complained of just now in some quarters is afforded. The men are not rightly handled. To keep a large staff working harmoniously to a single end demands administrative ability of a high

order. Judicious and just handling is of prime importance, the appearance of injustice, no less than a flagrant case of it, must be avoided.

Profit-making is the cream on the milk of industry. It represents only a fraction of the bulk turnover, and it may be forfeited in many ways. System and organisation is one part of the profit earning mechanism; the correct handling of labor and its incitement to real efforts are quite as important and not so apparent. To reach the desired ends needs a judicial temperament coupled to an endowment of common-sense, scientific spirit and a frank recognition of labor's human structure.

There are productive and unproductive periods in each working day, alternations of normal effort and natural slackness. It is the dead centres which want attention, not the time of full crank effort. Conditions and environment have much to do with output. A difference of 10 deg. in temperature unrectified will produce remarkable results. Fresh air and light, the former costing nothing, do much to effect the total output. The human dislike of sheer monotony, its desire for rational change, are other questions for consideration. Piece-work is one incentive, sheer interest in the job in hand another. If the "shop" recognises in its chief an able man, competent and efficient; the results will exceed those under the reverse conditions where and when they operate. Example does more than driving, as shown in the success achieved in many small concerns.

Production is a delicately poised balance dependent upon quite small things, which in the aggregate are apt to turn the scale. Labor is generally found to be more troublesome where the supply is strictly limited; then the necessity for right handling is more acute, and as a consequence the result is usually better and the staff more satisfied. The inevitable result of scarcity is an increase in realised value; reduced supply may result in insubordination, or, if the firm is wise, in improved conditions and better treatment. The intimate relation of isolated factory, scarcity of labor and welfare schemes point their own moral. The worst industrial conditions are found in large centres, where both man and management have a greater available choice. The necessity for better conditions is less apparent and certainly less realised. Labor trouble points to a lack of visualisation on the part of the management, to the desire on the

part of the man to pick and choose, that is, to find an open market for his skill, or to injudicious handling pointing to faulty executive.

Belief on the part of the man that he will meet with rational justice from his employer, who, he feels, is human and personally interested in his work, tends to retain skill and competency, even when offered better terms elsewhere. More than one highly-qualified producer has failed because of his inability to understand men other than as numerals or portions of an essential mechanism. Exploitation, or unfair treatment or possible dismissal for small reason in the case of a single individual, shakes the confidence of the rest; the co-ordination of a labor force and their dependence in daily work one on another lend fatal prominence to a seemingly minor issue. A small grievance is like a gear wheel with a damaged tooth, which disturbs the smooth running of the train. The hostilities and independence shown in labor troubles, the divorce of the men from the interests common to the firm, as a whole, have been at least partly made and fostered by such causes. Confidence once lost is not easily restored. Like a reputation, it represents a solid asset, and any effort to engender more cordial relations is worth the making, while the result is likely to be more beneficial than is often realised and well worth the trouble involved.

—"Engineering."

AUSTRIAN SHIPPING POLICY.

The Austrian Government, says "Hamburger Nachrichten," has given a long-wished-for sign of activity concerning provision for the future of Austrian shipping by publishing the draft of the new Marine Support Bill. This measure gives increased incentive to shipbuilding, and gives owners much needed support in connection with after the war problems. An important alteration compared with the law which expired at the end of last year (after 10 years' operation), is the increased allocation for building subsidies. The old law limited the construction bonus to 25,000 tons per annum; which figure is raised to 60,000 tons by the new law. Since unclaimed balances cannot be carried beyond 1921, it will be in the interests of owners to take full advantage of subsidies prior to that date. The expiry of the agreement with the Oesterreichischer Lloyd, will leave the Government a free hand in the matter of shipping policy in 1921. The State undertakes additional liability of about £93,000 per annum by the increased subsidies. In order to permit of speedier action during the transition period after the war, the notice to be given by the Government before reducing or suspending the voyage subsidy to any line is reduced from six to three months. The Government is empowered by the new measure to make advances needed by ship-owners to cover working expenses and supply necessary equipment.

How the Military Critic Works

By Edmund Dane.

Military matters overshadow all else now that the titanic struggle between the Allies and the Central Powers has reached a crisis. We eagerly absorb all the news that reaches Australasia concerning the progress of the war, and, after reading, often wonder how the military critic is able to set out what often happens to be a most accurate forecast of events. In the following article, Mr. Edmund Dane tells us many important things concerning the work in which he has built up a world-wide reputation.

Critic, in its original sense, "a judge," like many another good word, has taken on a bad meaning. It is not the business of a military critic, so-called, to pick flies out of people. It is not his function to be wise after the event. That helps nobody. Least of all is it his concern to offer advice to those who know a great deal better than he does. His work, if it is to serve a public purpose, is that of a guide. In short, he is a critic in the original sense of the word, and not in the derived sense. And obviously his value as a guide must depend upon his judgments. If events consistently falsify his judgments he has mistaken his vocation. On the other hand, if events bear them out, people imagine there is some mystery or hocus-pocus about the thing. There isn't. If you have the needful knowledge, joined to a certain amount of horse-sense, especially the horse-sense of thinking for yourself, you can set up as a military critic without more ado, and all the chances are you will do well at it.

Strategy and Tactics.

The military art is a world in itself like law or medicine. To begin at the top by absorbing a smattering of strategy is of no use whatever. That simply tempts a man to rush to conclusions, which, it is a thousand chances to one, will be wrong. Many an individual who has thus "got up" strategy soon finds out that he needs to know something about tactics. As soon as he starts upon tactics, however, he discovers, in turn, that he cannot get on until he knows something about the training and organisation of the arms of a military force—the infantry, artillery, and cavalry, and now-a-days, the airmen, and how they work together. Then he needs to know something about the necessity and functions of the Services—the Staff, the Engineers, the Transport, the Army Service Corps, the Medical Corps, and how they are fitted in. He must understand what an army actually is before he can grasp what it may do.

The feature, which most of all marks off the modern army from the bodies of men who passed as armies in times gone by, is the development of the Services. Not much honour and glory perhaps are attached to transport and supply work, but if that work is not scientific as well as vast, neither the mammoth armies of the present war would be possible, nor the keeping of them afoot. The latter is the real miracle of organisation. These millions of men want food day by day, and boots, and clothing, and all sorts of equipment. They use up munitions in incredible quantities. The hundreds of thousands of horses need fodder and harness, and horse shoes. The tens and tens of thousands of motor vehicles have to be kept going, and kept up. It is a tremendous business although it is all in the background. Yet everything depends upon it. And everything, too, from another point of view depends upon the Medical Service. Curing wounds

is not more important than preventing sickness and epidemics, and checking the effects of exposure.

Organised into divisions, each a complete army on a small scale, the mighty complexity we call the British or the French army is fitted together like the multiple parts of a machine, every individual and part shaped for his or her share of the work by special training.

It is, however, after all a human machine, with a spirit or moral, and a native character. You can never say that one army of a million is the exact equivalent of another army of a million. Differences of moral and, to a less extent, of native character may make them quite diverse real values. Hence, besides a clear idea of what a modern army is and how it works, it is necessary to turn to military history and the records of campaigns, ancient as well as modern.

Reading Between the Lines.

Let us assume the military critic to be thus equipped with the necessary technical and historical outfit.

The first, as it were, defines boundaries by marking out what not to expect, and rules out the most fertile of all sources of error—belief in the impossible. But in contrast, it enables an informed mind on the facts given to see a battle. The published official message may be compressed with military brevity into a few lines. Nevertheless, every statement is significant and has a clear cut technical meaning. A general in command of an army, in the physical sense, sees very little of an action. Even were he to go well forward into the zone of fire he would not see much. A modern battle extends over miles, often over many miles, of ground. No eye can from one spot at one time take in more than a fraction of it. But situated at some central point, receiving constantly reports and messages of what is being done, the commander can mentally view the action as a whole, and in the clearest detail, and although this view is mental and not physical, yet if the reports be exact, as with rare exceptions they are, the mental view will only be as clear as an actual physical survey, but much more reliable, because so much more comprehensive. Upon that mental view, and upon its accuracy, the commander issues his orders. If besides the technical knowledge which thus enables him to see with his mind's eye his troops at work, and to follow their operations phase by phase, and as a whole, he be a man of sound and ready, which usually means independent judgment, all the probabilities are that his enterprise will succeed. For a general of sound judgment, versed in the art of war, does not in the first place enter into an undertaking unless and until he has assured himself both that his plan is good, and that his forces are well able to carry it out, and in the next place the troops themselves have confidence in such a leadership. If the

staff work be bad, all sorts of contingencies turn up in a battle which have not been provided for, and the enterprise goes to pieces. Nor can the greatest bravery on the part of the men wipe out the effects of confusion. If the Staff work, on the contrary, be good, every probable contingency will have been foreseen, no resources are wasted, and the enterprise remains solid. It is thus perfectly true to say that it is generals who win or lose battles, for the whole power of an army arises from that unity in action which it is the very purpose of military organisation to create, making the strength of a million human atoms the strength of one enormous organic mass.

Official Communiques.

With rare exceptions, official communiques are incomplete in this respect. They do not mention the forces employed in an attack, nor the number and calibre of the guns. Information of that kind is not given because it would be of the greatest service to the enemy, nor is it allowed to leak out until after a safe interval of time. Subject to such reservations Allied communiques are perfectly reliable, and deliberately sober in statement. The character of German communiques has varied. At the beginning of the war when the Germans seemed to be, and believed they were, carrying all before them, the bulletins were marked by over-statement. For instance, on one occasion, they recorded that they had driven the British army into Maubeuge. They had only driven into that place part of a rear-guard of the 1st Army Corps. This mis-statement arose either from carelessness of the Intelligence Service, or from a desire to flatter the Kaiser and impress the German public with the news that the Royal and Imperial Order to over-run the British Army had been executed. Probably the latter is the explanation. More recently the art has been developed of hiding reverses.

First comes a florid account of the heroic German resistance and of the alleged sanguinary losses inflicted on the attacking troops. Then an admission, usually indirect, and as an aside of no great moment of the loss of some important tactical position. This is the pill; the preface is the sugar coating. Or it is stated one day that the attacks completely failed, and the next that the fighting is at a new point well to the rear of where it was supposed to be. Assertions of this kind have been mostly concerned with operations on the enemy section of the Western front, commanded by the German Crown Prince, and they undoubtedly represent official toadyism. The Crown Prince's reputation as a general, and he is a very bad one, must be safeguarded at all costs. Generally the grossest falsifications have been inspired by his "misfortunes." A dozen other German generals would have been "broken" for the half of them. But he, like the brook in the poem, will, we may assume, go on blundering for as long as the war lasts.

Kitchener's "Three Years."

Enough has perhaps been said to show that war is not a clash of blind mechanical forces but essentially a struggle between opposing forces of mind. Judgment plays very literally the commanding rôle. It has been stated of the late Lord Kitchener that he possessed a judgment which appeared to work like instinct. He had no hesitation in insisting that the country must prepare for a three years' war. At the time the grounds of that decision seemed obscure, and it took the world by surprise. It rested on the answers to these questions: (1) What resistance can be offered to the German at-

tack? (2) Assuming the attack to be checked what force can be applied to overcoming the German defence? The common belief was that the German attack could not be successfully resisted, but Lord Kitchener knew the military strength of France, and was convinced that British strength, if organised on the necessary scale and thrown in, should turn the balance. Lord Kitchener was just the man to shoulder this huge task of organisation, because his training had been that of a service man—a military engineer. He knew the all important part which efficient services play in keeping armies afoot and fit, so that he saw the problem from all its sides and in the round. We might have raised great armies and then found, owing to deficiencies of supply, that the machine would not work, as happened on more limited lines in the Crimea, and in this war at the outset in Mesopotamia.

And the prediction of a three years' war would, there can be no doubt, have turned out absolutely exact but for the turn of events in Russia, resulting in political confusion and military paralysis.

When Will the War End?

The war will last until Germany is crippled; that is a certainty. The process of wearing down the enemy's resources has two aspects—economic and military. Economic pressure as regards both food and raw materials affects labor power, and hampers and limits the upkeep of the armies. Remember the importance of the military services in war. Next the foundation of the German armies, their infantry, always the weak spot has been heavily undermined. This has been done deliberately, and from the first. We have subordinated everything to the killing of Boches. From our point of view, it is the essence of the struggle. A German army without infantry, and a Germany without men will be finished with alike. That may sound severe, but it is the Germans themselves who made the war what it is. Not only has the undermining been very far advanced, but it is bound to go on always at a faster rate, unless the Germans themselves, throwing off the military despotism they have grovelled before, choose genuinely to toe the line in the community of nations. There is a limit to the enemy's military resources, and it has been in sight now for some time.

(Lloyd's Magazine.)

Magnanimity in politics is not seldom the truest wisdom; and a great Empire and little minds go ill together. We ought to elevate our minds to the greatness of that trust to which the order of Providence has called us.

—EDMUND BURKE.

Occult Revelations.

The Editor, "Sea, Land, and Air."

Sir,—I have read with intense interest the article in your April issue entitled "Occult Revelations of a Flying Man," in which "A Philosophical Aviator" relates the remarkable experience of his friend, who, on several occasions, has been "somewhat perplexed" by meeting a dragon in the sky. I am pleased to be able to support the "aviator's" story from my own experience. I have never been in the air, but I have spent much time in submarines, and have met with innumerable sea-serpents. I believe the air-dragon and the sea-serpent are blood relations, because several times when passing through the foot of a rainbow, where it touches the sea, I have seen these two creatures together.

Yours, etc.,

A PSYCHOLOGICAL SUBMARINIST.



Flying and Aviators



Germany has increased her aviation service, presumably with the object of being prepared for the time when the American airmen will begin to operate extensively. The German air services are controlled by General von Hoeppner, and, according to an official report, he had at the end of 1917, 2500 machines under his control. They were divided into 273 squadrons, made up as follows:—

Bombarding squadrons, 23; chasers, 40; protection squadrons, 30; patrol squadrons, 80; artillery squadrons, 100—total, 273.

To these groups must be added the aeroplanes and

It is almost incredible that even the tame German populace can be so utterly gullible as to accept the very thin Lord Kitchener story for which certain "well-informed neutrals," who have been in Germany recently, are responsible. The story, so it is affirmed, of Lord Kitchener's captivity is kept up there in order, it seems, to relieve the anxiety of those who are becoming seriously scared about the threatened British air raids. According to all accounts, the authorities there fear nothing so much as a panic, and reassure the people by the statement: "They know better than to attempt reprisals,



SIR WILLIAM WEIR, WHO WAS RECENTLY APPOINTED DIRECTOR GENERAL OF AIRCRAFT PRODUCTION.

hydroplanes of the Navy, a dozen or more garrison squadrons, and about a dozen training groups.

Despite the assurances of the military authorities that British raids on German towns would be returned "two for one," the German population is uneasy, as is disclosed by the following excerpt from a report of the Amsterdam correspondent of the London "Times":

"The air raid reprisals undertaken by the Allies are, I have good reason to know, having a most salutary effect in awakening the population to a sense of the consequences produced by the Germans' ruthless air raid policy. Only by this means can the German home population be brought to realise their rulers' mistakes. Every Entente air raid is a most valuable educational influence in this direction. Great nervousness is felt throughout Germany, especially in the more exposed parts, by the intention of the Americans to invade Germany by air. This subject is universally discussed, though efforts are being made to calm the uneasiness by declarations about American bluff."

as they know what would happen to Lord Kitchener!"

Sawatis Tawanladah, the chief of the famous Iroquois Indians of Canada, has, it is announced, put himself into training for the R.F.C., and is now in process of working for his wings. "S.T.," who has already, whilst serving in the Canadian Infantry, had a taste of fighting on the Western front, is prosaically and officially known in the Army as Lieut. J. R. Stacey.

The "Frankfurter Zeitung" states that several camps have been established in various districts of Stuttgart and in the neighborhood for British and more particularly for French war prisoners of all ranks, and also some hospitals for convalescent war prisoners.

It is added, in explanation of this, "they will have to share with the population of the town of Stuttgart the dangers of air attacks."

AIR RAID ON CONSTANTINOPLE DIRECT FROM LONDON.

The full story of the raid made some time ago on Constantinople by a British aeroplane, which flew from London, was told at the Cafe Royal, in London, by Mr. Handley-Page. Mr. Page's description is given below:—

The machine, which flew from Hendon to Constantinople, was a Handley-Page twin-tractor biplane, equipped with two 275 h.p. Rolls-Royce engines. It was a standard machine in every respect, complete with normal tanks and bomb-dropping gear, and the engines with which it was fitted were standard Rolls-Royce aviation engines. On board were the pilot, Commander Savory; the second pilot, Lieutenant MacLellan; the engineer, Lieutenant Rawlings; and two mechanics. There were also all their luggage, beds, and bedding, two tool boxes containing the spares, practically equivalent to a further engine. To complete the equipment there were strapped on the side of the fuselage two 11ft. 6in. four-bladed propellers, covered over with a tarpaulin, the whole being very securely fixed to the side of the fuselage. Complete, the machine was over six tons in weight, and as its weight when light was about 8000lb., a useful load of no less than 6000lb. was carried on this flight.

Setting out from Hendon, the company of five reached Paris, and flew through France down the Rhone valley to Lyons, and on to Marseilles. From Marseilles they flew to Pisa, and thence to Rome, where they landed. The aviators were received by the heads of the aeronautical staff there, and a very hearty welcome was extended to them. From Rome the battleplane proceeded to Naples, and on to Otranto. Crossing the Albanian Alps the aviators flew on to Salonika, and thence to their base to prepare for the final stages of the trip to Constantinople, which involved flying 250 miles over a hostile country.

While flying across the Albanian Alps, cross winds, clouds, and all kinds of atmospheric disturbances rendered the latter portion of the voyage most difficult and perilous. The mountain peaks range from 8000ft. to 10,000ft. in height. Happily, the engines never failed for one moment, and even with the heavy load on board there was never the slightest fear on the part of the pilots that any trouble would arise.

After a short rest at their base and careful overhauling of the machine, the airmen set out on what was the culminating achievement of their wonderful flight. The bombing of the Turkish capital was done at night. A 2½ hours' journey brought the two pilots and engineer left to man the aeroplane over the Sea of Marmora, and straight up the Sea of Marmora they headed for the attack on the Goeben and the Turkish capital itself.

Constantinople was reached when flying at a height of 2000ft., and there, lying beneath them, could be seen the Goeben with all lights on and men walking on deck. Constantinople itself was brilliantly illuminated. The Golden Horn was clearly silhouetted.

Once the aeroplane flew along a line parallel with the Goeben so as accurately to determine its speed and give the necessary data for bombing. Circling twice, the machine dived down to 800ft., and a salvo of four bombs was released. The first salvo missed the Goeben, but exploded against one or two submarines lying at its side. Again the aviators flew round, in order to make certain of their aim, and this time they hit the Goeben with

four bombs.

The dropping of the eight bombs seemed to disconcert the Turks, for all lights suddenly went out. The pilots then made off towards the Golden Horn, and dropped two more bombs on the ship called the General, which was the headquarters of the German General Staff. Finally they flew over the Turkish capital and dropped two more bombs on the Turkish War Office; which, in the words of the Turkish communique, "was not destroyed."

By this time considerable alarm seems to have been caused in Constantinople, and guns, which had not been previously fired, were now directed upon the aeroplane. In fact, the flight back down the Sea of Marmora was accompanied by a fusillade of shrapnel and explosive shells, and on arrival at the base it was found that no fewer than twenty-six bullets had penetrated the machine. One lucky shot partially disabled part of the oiling system of one engine, and the return flight was carried out with the second engine alone.

Over the Lines.

We were flying in formation, and contrived to keep our station,
 Though the wind was trying hard to sweep the sky;
 And we watched the puffs of powder, heard the big guns booming louder,
 And we didn't need to stop to reason why.
 With the German lines below us, and a gale that seemed to throw us
 Into nowhere, as it would a schoolboy's kite;
 We went skimming through the ether, always keeping close together,
 And we felt the joy of battle grip us tight.
 Then, from out of the horizon, which we kept our eager eyes on,
 Came the Hun 'planes in a furtive sort of dash;
 Soon the Lewis guns were cracking, and a couple started backing,
 And a third was sent to Glory in a flash.
 Jove! We blessed our Bristol fighters as we pulverised the blighters,
 And we chased them and we raced them through the air.
 We abandoned our formation, but we won the situation;
 Won it handsomely, with four machines to spare.
 Then the rain fell by the bucket, and the Lord knows how we stuck it;
 But we dropped at G.H.Q.—a velvet lawn!
 To retire, a trifle merry, on a feast of cake and sherry,
 With a fierce and frantic longing for the dawn!

—G.R.S., "Aeronautics."

Benjamin Boyd and the "Wanderer"

It frequently happens that fragments of early history are secured in the most unexpected places, and but for the fact that records come into the possession of one who realises their value they would be lost for ever. This is illustrated in connection with the following account of an early day adventure in the Pacific, the information being obtained by Mr. Osborne from a book entitled "The Last Cruise of the Wanderer," owned by a gentleman of Fijian birth, residing at B. A. Western Viti Levu, who, whilst regarding the work as a family treasure, did not realise it had any historical value. From the excerpts he obtained and the knowledge gained during his sojourn in Fiji, Mr. Osborne has pieced together the following account of one of the most remarkable enterprises undertaken in the Southern Hemisphere.



The Preface says:—"These Memoirs have been extracted from a journal not intended for the public eye. They have only been committed to print after so great a lapse of time at the request of certain friends of the writer. It has been thought that they may prove interesting . . . as a record of the last enterprise of a man so well-known and esteemed as Mr. Benjamin Boyd . . . There was here an untilled field for such an enterprise as possessed peculiar attraction for a man like Mr. Boyd. He therefore decided, when in California, upon a cruise among these islands. . . . It was the love of adventure, no doubt, which constituted the great attraction. But there was a definite object in view. This was to establish a Papuan Republic or Confederation; to lay the foundation of some sort of social and political organisation, on which the simple machinery of an independent State might be afterwards erected. Had not death cut short Mr. Boyd's career, he would doubtless have succeeded in his object. As it is, the task is reserved for others."

Which proves the adventurers entirely unfamiliar with the peoples of the Pacific, and visionaries indeed.

The expedition consisted of the "Wanderer," R. Y. S., and her tender, the "Ariel." "The 'Wanderer' was a very handsome and fast-sailing topsail schooner of 240 tons O.M. . . . Her armament consisted of four brass deck guns, two six-pounders and two four-pounders, mounted on carriages resembling Dolphins; two four-pounder rail-guns, two on each side; and one brass twelve-pounder traversing gun ('Long Tom'), which had done service at Waterloo. In all, thirteen serviceable guns. . . . There was ample stores of round shot and grape for the guns, and a due proportion of small-arms, boarding pikes, tomahawks, etc. The 'Ariel' was a schooner of about 120 tons,

purchased at San Francisco. She carried supplies for the expedition and goods for trade with the natives. The writer . . . was the commander of the tender, but preferring to sail with Mr. Boyd in the 'Wanderer,' he deputed her command to a Mr. Bradley as Sailing Master. . . . Two other gentlemen, Messrs. Barnes and Crawford, friends of Mr. Boyd, were associated in the enterprise. The services of a Mr. Ottiwell were also secured as Sailing Master for the 'Wanderer.' The crews of both vessels were composed of Islanders. . . .

The "Wanderer" and her tender left the roadstead of Sausalito within the "Golden Gates" of San Francisco on the morning of 3rd June, 1851. It will interest those who knew San Francisco of quite a few years ago to read this: . . . "In the vicinity of Sausalito, we found an abundance of game, elk, deer, bears, geese, ducks, etc. . . ."

Mr. Boyd called at the Hawaiian Islands and gives a somewhat guide-booky description of the stay. Thence the "Wanderer" stood for the Kingsmill Group, striking first Nukunau, where a stay was made. The wanderers sighted Beru atoll, but boisterous weather compelled them to bear away. They stood on and off Nanouti reef, but without landing, contenting themselves with bartering with the natives for fish and coconuts. Mention is made of Mucha (meaning, no doubt, Namoka), where the principal village was situated. Mistrusting the fierce-looking and evil-famed natives as much as the dangerous reef-studded approaches to the lagoon, the "Wanderer" sailed away to Tabeteuea Island, arriving there during the historical (within the group) war between the North and South ends of the forty mile long atoll.

From Tabeteuea the "Wanderer" ran down to Ocean Island (Banaba). Mr. Webster speaks at some length of the explora-

tion of that curious dot. Little did Mr. Boyd suspect that he stood upon the richest spot for its size in all the world, and that, had he but known it, riches beyond the dreams of avarice were his for the taking. But Ben. Boyd knew nothing of phosphate of lime, and that vast deposit was destined to lay unknown for 48 years to come, and to yield its secret to an accidental discoverer.

As a resident of more than a dozen years in these regions, I could not help being impressed with the keen and accurate observations made, and the truthful chronicling of the observations, which is a different matter. They erred chiefly in overestimating island populations, a usual mistake of casual visitors.

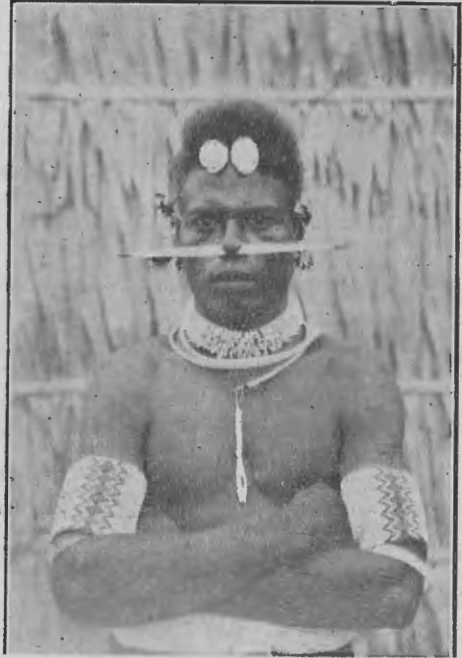
The book is illustrated with photographs, after all these years excellently preserved, but obviously taken from sketches made from memory after the cruise. Curious errors appear, not only in the native types, anatomy, and in island vegetation, as instanced by the banana background to Gilbert Islands types. The most curious errors are made in the structure of the palms, whose stems are too slender, the crowns too scantily leaved, and without pendant dead fronds, and the invariable absence of the central leaf-bud spike of the palm.

From Ocean Island the "Wanderer" ran before the trade wind to Steward Island; thence to San Christobal in the Solomons; Wanderers' Bay and Makim. The next call was made at Guadalcanar, where, in an unnamed bay, Benjamin Boyd was killed.

Boyd and Webster had arranged to go on shore together, but the latter, late in rising after keeping late nightwatch, found Boyd midway to the beach, calling back that he would return for breakfast and bring game back with him for the dinner. The last seen of Boyd was as he entered a small creek. Soon after a gunshot was heard, and, some fifteen minutes later another, and that was the last ever heard of the unfortunate gentleman. Shortly after the last shot the savage people attacked, and all but captured the "Wanderer." Benjamin Boyd fell, and his fellow-wanderers in the schooner came near falling victims to the folly of underestimating the capacity for mischief of the negroid races of the Western and North-Western Pacific—the "Tut, tut, treat them right and they are good fellows," which has cost so many ignorant men their lives. It will sound incredible to men who know, that in those days a rover approached savage Guadalcanar with no gun out or even shot, and without a weapon on deck—this,

where, a third of a century later, a scientific party from an Austrian ship-o'-war paid, at Lion's Head, the penalty for a somewhat similar folly. As far as has ever been ascertained to the contrary, Benjamin Boyd died shortly after six o'clock on the morning of October 15th, 1851, and was probably eaten.

Swimming in the water alongside the schooner, Webster and Barnes noticed the natives in approaching canoes signalling and producing weapons concealed in the bottoms of their craft. In utmost confusion the party proceeded to arm themselves. " . . . The deck-guns were neither run out



A NATIVE OF THE SOLOMON ISLANDS.

nor loaded. . . . I . . . darted below and handed up . . . muskets and . . . a case of cartridges. 'Keep from firing,' I said. 'Remember Mr. Boyd.' . . . Suddenly a cry rose from the water, a cry, which heard once could never be forgotten. It was as if a host of demons had been let loose. The air resounded with their yells and the sullen roaring of numerous war conches. The next instant a shower of spears, arrows, stones and other missiles came whistling at us, and for the moment we all sought the shelter of the bulwarks to allow the first storm to pass. We then fired into the crowded canoes with murderous effect, as we had loaded our muskets with ten pistol bullets each. . . ."

They beat the savages off, inflicted heavy punishment upon them, burnt their villages, and made every effort to find Mr. Boyd, but without avail. Together with his Ocean Island boat-boy, Boyd had disappeared. The upper portion of a fresh human skull, appearing to have been baked, was found. Portions of the scalp had been removed, and a few straight black hairs remaining seemed to prove the skull to have been that of the ill-fated Banaban. In the last attack, made on October 19th, on another of the savage coast peoples' villages, the avengers all but met their end. Toward the end of the attack a heavy gale sprang up and only by luck did the boat strike the "Wanderer," laying to in the dark, trailing her lee guns in the water under the furious blast. In a few minutes the yards were

abled spars, and with both masts sprung, she ran in before the wind with a heavy surf thundering on the bar. She struck bottom several times, then her keel caught, swinging her broadside to the seas, and she was flung upon the rocks. One of the native crew swam a line ashore, a warp was brought out to the rocks, and all hands landed. In a few days not a vestige of the beautiful schooner remained.

Rumors that Benjamin Boyd was alive and that his initials carved in the bark of trees had been seen, were brought to Sydney as late as the last half of 1854. A head, bought as Boyd's for twenty tomahawks from the natives by Capt. Truscotte, of the "Oberon," proved to be an old native skull, and was presented to the Sydney Museum.

The last to investigate these rumors was



PORTION OF THE COASTLINE OF THE SOLOMON ISLANDS.

squared, and the schooner scudded away.

Bad luck pursued the adventurers. They ran short of water and out of firewood, and were compelled to burn the spare spars and the boat in which Boyd went ashore when he was killed.

The present writer has seen a steamer, short of coal, burn her loose wood on the same coast. In thick weather they sighted on November 7th, what they thought to be Cape Morton, and on the 11th were struck by a severe north-east gale, before which they ran south along the coast. Off Port Macquarie the wind suddenly chopped dead ahead, with thunder and lightning, and the "Wanderer" was anchored in seven fathoms opposite the entrance. By midnight of next day it blew an easterly gale, and guns were fired for assistance. The master of a schooner in port came out to pilot them in, and, to lighten her, the "Wanderer's" ballast was thrown overboard. Unable to beat out to sea because of dis-

Capt. Durham, of H.M.S. "Herald," who, on the 20th of December, 1854, anchored close west of Cape Hunter on Guadalcanar. His, as well as previous investigations, proved nothing definite, but left no reason for supposing that Benjamin Boyd, visionary, had not been killed immediately after 6 a.m., October 15th, 1851.

The publication is entitled:

THE LAST CRUISE OF THE "WANDERER," by JOHN WEBSTER.

"To the memory of the late Benjamin Boyd, Esq., these Memorials of the 'Wanderer's' last cruise in the Pacific are dedicated as a tribute of friendship and esteem by his fellow-wanderer, John Webster."

Date and year of publication is not given, but the book was printed at Sydney by "F. Cunninghame, General Steam Machine Printer, 187 Pitt Street."

Inscribed on the flyleaf in longhand is: "To Chas. St. Julian, Esq., with the author's respect and best wishes. Sydney, April 21st, 1863."

The Younger Set

A plaint has reached our ears (no matter how; perchance by wireless telegraphy, our tried friend) that, when we launched our magazine, "Sea, Land and Air," upon the waters of our Commonwealth, we entirely forgot that great and important element in its composition—The Younger Set! Let us hasten to apologise and make good our negligence.

We have too much regard for our Younger Set to be able to overlook them for long, and in order to prove the sincerity and strength of our regard, we now propose to devote to their entire use—to lay at their young feet as it were—several whole pages of our magazine.

"Will they belong absolutely to us?"

"Will there be any age, or sex limitations?"

"Oh, and, above all, will there be prizes and competitions?"

These will be the thoughts that will set our air waves pulsating questions in dots and dashes to us, just so soon as these words are read by our young people. Some power of divination is ours—and we know!

Therefore let us answer the questions ere the air demands them of us:—

(1) Three pages will be given in entirety to The Younger Set.

(2) The only age restriction laid down, is that the members of those pages must be young. Absolutely young. For instance, not over sweet one-and-twenty.

There will be a Scout's corner, which, in itself, must necessarily be a sex limitation, but to every other corner of the pages, the lasses will be as welcome as their brothers.

(3) And, yes, there will be prizes and competitions, and as many other attractions as we can fit into the given space.

For the rest of our plan we are constrained to say, as they do sometimes at the temporary end of an exciting serial story—"Watch for our next issue."



MUFTI AND UNIFORM.

TO REPLACE CHOLERA BELT.

Men "over there" have found great advantages occurring from a supporting belt designed to take the place of the woollen "cholera belt." The belt in mind is made of woollen fabric, made to buckle at the front, and wide enough to afford support with no suggestion of corset about it—it is just a body belt, and that is all. Incidentally, it is supposed to be medicated in some way to repel vermin that inhabit the trenches. Those who have given it a trial have no faith in it as far as this quality is concerned; they say that trench vermin will not inhabit the belt itself, and that is all—the medication is not strong enough to keep these unwelcome attendants away from the wearer. But the belt itself, they say, is a comfort when one has a good deal of physical exertion to get through, or a lot of standing about, which is just as bad as hard work if one has enough of it.

A NEW TYPE OF PERISCOPE.

A well-known English firm has just put on the market a new type of periscope designed for the use of artillerymen. It is a prism instrument, having an adjustable focus, and there is a universal joint with gimlet for fixing either into a handle that is supplied, or into any convenient support. There are plenty of places on a field gun that make convenient supports. The main points about this periscope are its magnification of ten diameters, perfect definition and the lighting. The definition is perfect—a small-power pair of fieldglasses can give no better, and the image is perfectly free from distortion or discoloration. Then, as to the lighting, this is the best that the writer has ever seen in any prism periscope. Observations were made on a dull day in London, and objects showed just as clearly and as well as when viewed by the naked eye. It would have been quite possible to use a camera in conjunction with the periscope, and to obtain admirable negatives. It may be remarked in passing that this is not a cheap instrument; it is, in fact, more costly than the majority of prismatic periscopes at present obtainable through ordinary channels, but a R.F.A. officer has only to see it to realise its remarkable powers, and the use it can be in connection with field artillery work.

THE LATEST CONVENIENCE.

Conveniences for the "man at the front" continue to be devised in great numbers. One of the latest innovations that can come under the heading con-

veniences is a cigarette, note case, and cheque-book case combined. To one side is a good space for cigarettes, to the other a particularly clever arrangement for notes, while at the back is a division into which a cheque-book readily fits. There is also room for stamps and visiting cards, and then the whole affair folds compactly over, going easily into the ordinary sized jacket pocket, and taking up little room.

The great art of things now-a-days is compression, and this little contrivance is the acme of miltum in parvo.

ANOTHER NEW LIFE-BELT.

The great number of troops that have had to be sent overseas, and face the ordinary perils in addition to those devised by our "Kultured" enemy, has provided the man with an idea concerning lifebelts with ample scope for his inventive abilities. Just how many lifebelts have made an appearance on the market since the war began is difficult to estimate, but the number is certainly large, consequently many are prone to regard something new in the line very lightly.

The latest belt, however, deserves attention, for it possesses many good qualities and holds promise of proving a very valuable device. It consists of two long rubber pouches, joined together, but kept as two separate compartments by a valve. In each pouch is a certain amount of some liquids, which, so long as the valve is untouched, just stay there and leave the two pouches flat, so that one may wear them round under the lower part of a vest, and they give no trouble and pass unnoticed. But, if one is flung into the water unexpectedly, one just pulls a cord attached to the valve, and the liquids in the two pouches, as soon as they mix, generate such a volume of gas as to inflate both the pouches. Lest it should be doubted whether this method of inflation is sufficient to keep one man afloat, it may be remarked that tests have proved that the pouches are sufficiently buoyant for one set of them to keep two men afloat for thirty-six hours, which is longer than a man can stay in the sea with any prospect of living, as a rule. It will be noted that there is no trouble of inflation of this kind of lifebelt; also, that the belt itself is small and inconspicuous when not required for use, so that one may wear it all the time if that is deemed advisable. Another point in its favor is that it is cheap, while, if required for use more than once, two refills of the liquids for gas-making are supplied with every belt. It is a very ingenious life-saver, and should command notice for all who use the sea while the submarine peril lasts.

A FRESH SHIPPING BOOM IN NORWAY.

There appears to be a marked revival in Norwegian shipping speculation. According to N.H. og S.T., new shipping companies were founded as follows:—

May	5 Companies,	with £998,000 max. capital		
June	11	£898,000	„	„
July	9	£372,000	„	„
August	10	£745,000	„	„
1st-8th Sept. 8	„	£1,460,000	„	„

Of these 43 Companies, with a maximum capital of £4,460,000, four are sailing ship-owners, twelve are motor ship owners (including six who own motor ships between 250 and 750 tons), and five are concrete ship owners. The price of vessels concerned in these foundations is very high, frequently exceeds 1,000 kr. (£55), per ton dead-weight capacity. A 4,300 tons steamship has been bought for £263,000, and one of 3,000 tons for £197,000, whilst £41,500 each has been paid for two 1,000 ton steamships of wooden construction.

Those in Our Sphere

AERIAL RAIDERS FOILED.

A fleet of zeppelins was recently dispatched to raid London, but in a totally unexpected manner the design was frustrated, several being wrecked by gunfire and one captured intact. Experts who examined the wreckage, also the mechanism, of the intact vessel claim that the failure of the expedition can be attributed to those in charge of the wireless apparatus not being able to establish communication with the land stations in Germany. It appears that the vessels were sent out in a favorable wind, but when they arrived over England it changed to the north, and when they arose to escape the "archies" a strong gale was blowing in the upper altitudes. Then they got out of touch of the land stations, and as up to the present no means have been found for calculating drift they were unable to set a course for the return passage.

While endeavoring to communicate with the land stations they fell victims to the British anti-aircraft guns.

WIRELESS AND THE VATICAN.

Should the suggestion to establish a wireless station on the dome of St. Peter's, Rome, be acted on, the Vatican will have a news bureau without a peer. The idea has been evolved for the purpose of the Vatican receiving independent transmission of messages of a diplomatic character in code, as well as to receive confidential reports from the Papal representatives abroad. Should the stations be erected, the Vatican will be able to communicate direct with Switzerland, Austria, Germany and Sweden, and will not have to rely upon newspaper despatches, as is now the case. From what can be gathered, the Italian Government is not adverse to the idea, as the establishment of the station would aid in relieving the congestion on the existing lines of communication.

WIRELESS MEN AND THE CANADIAN WAR LOAN.

One of the most interesting exhibits at the recent Canadian Victory Loan Parade was provided by the Marconi Wireless Telegraph Company of Canada. It consisted of a float with wireless operators at work, a complete transmitting and receiving set being manned by operators who had suffered at the hands of Hun pirates. The attention of onlookers was drawn to the fact that wireless is playing its part in the war, placards stating, in English and French: "We'll save your life at sea—you save money at home." Copies of telegrams from the Governor of Canada and the Minister of Finance sealed in Marconigram envelopes were showered on the crowds in the street, and were eagerly sought after as souvenirs of one of the most gorgeous carnivals ever witnessed in Canada.

SENATORE MARCONI IN AMERICA.

Senatore Marconi has proved himself particularly well qualified to fill the important position of Italy's High Commissioner to the United States. His extensive knowledge of the science his name will for-

ever be linked with, coupled with the experience he gained while serving on the staff of Italy's famous military genius, General Diaz, is proving of very great benefit at the various conferences, dealing with the conduct of the war, he attends. Senatore Marconi is a staunch admirer of the Americans, and is in turn widely respected by them.

In the course of a recent speech he remarked, apropos American-Italian relations: "The friendly feeling and concrete measures adopted by the American people in favor of Italy deserve our entire gratitude. We must consider the spontaneous American intervention in the war with special interest."

Discussing conditions in Italy with an interviewer, soon after his arrival in New York, Senatore Marconi said:—

"The reorganisation of the entire Italian army is proceeding apace. It makes us confident that the onward march of the enemy will be definitely stopped.



SENATORE G. MARCONI, G.C.V.O., LL.D., D. Sc.

"I saw the Duke of Aosta (Commander of the Third Army), General Diaz (commander-in-chief), General Badoglio (second in command), and other leading commanders. All were filled with hope that the worst is over, that the revival of the morale of the soldiers, which is constantly more noticeable, may give unexpected results. I found everywhere that the spirit of the troops was very high. The men are desirous of taking revenge for the reverses suffered, and are furious at the thought that any Italians had been cheated into believing Austrian and German lies when the enemy announced the intention to lay down arms if the Italians did the same.

"The navy, operating with the army along the coast and in the lower section of the Piave, is gaining splendid successes, to which the British monitors are contributing. The Italian artillery is doing marvels, getting the last ounce possible out of all the guns along the Piave."

The love of liberty with life is given,
And life itself the inferior gift of Heaven.

—JOHN DRYDEN.