KORERO

AEWS BACKGROUND BULLETIN • VOL 2 • NO. 1

IN THIS ISSUE

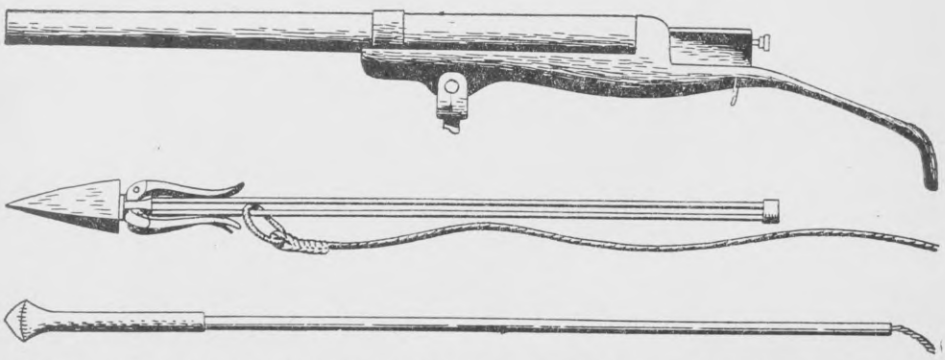
ABOUT KORERO

Korero is the A.E.W.S. Background Bulletin enlarged and—it is hoped—improved. It still contains articles and maps on world affairs, but has more articles on New Zealand topics.

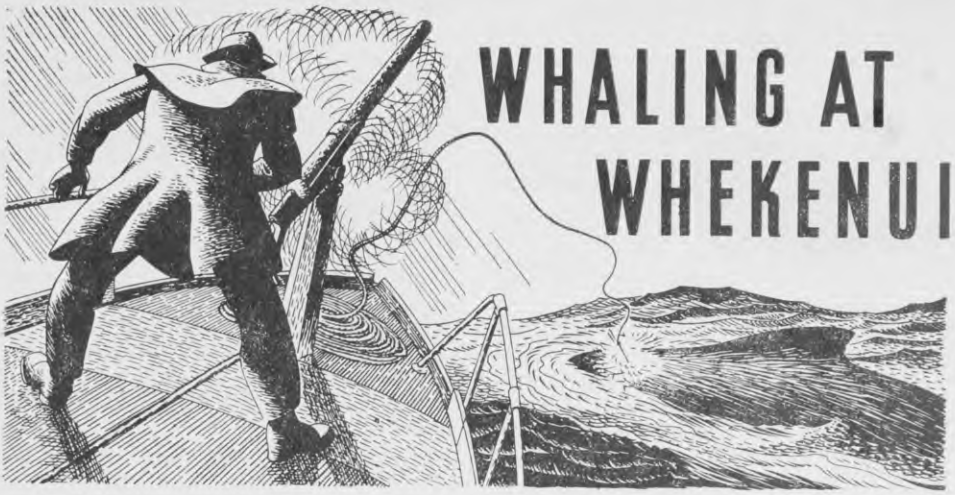
Korero is still a background bulletin in the sense that most of its articles are related to the subjects dealt with in the Discussion Bulletin. Its main purpose is to help Current Affairs discussions by giving men a wider background of knowledge.

Education Officers and Unit Education Officers are asked to make sure that *Korero* circulates. There are still too many instances of Current Affairs Bulletins being held on orderly room shelves and accumulating in drawers.

All men and women of the forces are invited to contribute to *Korero* articles, sketches, photographs, or black and white drawings. No written contribution should be more than 1,500 words. Ideas for articles and drawings will also be welcomed. The address is: D.A.E.W.S., Army H.Q., Wellington. Mark the envelope *Korero* in one corner.



Weapons used by the whalers. From top, harpoon gun, harpoon, and explosive bomb.



WHALING AT WHEKENUI

By a KORERO Staff Writer

THE TRADITIONAL CRY of the whalers, "There she blows," has been heard in Tory Channel for over one hundred years. Whalers were amongst the first white men to settle in the Marlborough Sounds, and as early as 1827 the whale was chased and slaughtered in Cook Strait as it made its way northward from the Antarctic.

In those days the men of Captain Jacky Guard's fleet rowed out into the winter seas, hurled their harpoons by hand, fought and played their huge quarry with straining oars, and despatched it by lance when it could fight no more.

To-day the whalers still speed out into the Strait, but their craft are high-powered launches and their weapons explosive harpoon and bomb. Keen eyes still search the Strait for tell-tale spouts, and the cry of "There she blows" still stirs the blood of whale-boat crews as it did in the days when men in open boats first chased the hump-back far out on the waters of "The Strait of Adventure."

The "Tamahine," on her way up and down the Sounds, passes within a quarter of a mile of the old whaling-station and the new; yet few of her passengers realize that the broken jetty and the rusting try-pots are the only relics of "Old Tar White" or that the iron sheds that cling to the cliffs of the next cove and the trim launches that ride quietly on the tide are the active machinery of the new industry at Whekenui.

Regularly the whales appear out in the Strait, and until the end of August they pass through this narrow stretch of stormy water. They have come from the south-east and are heading across the Tasman and up the coast of Australia. When they reach a certain latitude they strike out across the Pacific, to return to their original feeding-grounds. Thus the circle is completed for those that elude the chasers waiting in Tory Channel.

The whalers have proof of this long journeying of the whales. A few years ago they caught a hump-back which was found to carry an old harpoon. The shaft was broken, but the head was intact, and on it the owner's brand was clearly visible. A check of an Australian whaler's records revealed that the whale had been first harpooned off the Australian coast eleven years before.

The commonest type of whale caught in the Strait is the hump-back, though a larger variety, the blue whale, is sometimes killed. One of these last species was a record for the station, its over-all length being 98 ft. The average length of a whale is about 50 ft.

A whale-chaser.

Since whales are mammals they must come to the surface to breathe. They do this regularly every ten or fifteen minutes, and their exhaled breath ("blow") rises as a condensed vapour to a height of about 10 ft. While on the surface they usually "blow" three times before diving. It is these miniature geysers that reveal the whale's location, and from their look-out 300 ft. above the Strait the whalers can, with powerful glasses, pick up the whales many miles away.

The modern whale-chaser is a speed-boat with a crew of two, one man at the helm and another manning the harpoon gun on the bow. Each boat (there are four in the fleet) is 34 ft. long with a 7 ft. 6 in. beam. Built on long slim lines and driven by engines generating an average of 280 horse-power, the fastest of the chasers travels at 35 m.p.h. and the slowest at 22 m.p.h. Handling them at speed in a heavy sea and manœuvring them when harpooning or playing a stricken whale is work for highly trained men with strength, steady nerves, keen eyes, and almost perfect judgment.

Nor is the work of harpoon gunner a sinecure. Crouching on the narrow prow while the boat bounds and slews through rough seas with no foothold except a strip of wet coconut matting and no support except his gun, drenched with blinding spray as the waves sweep over the bow, with only a few seconds to sight his prey and fire his harpoon, this is work with thrills and danger enough for the most adventurous.

The gun (40 mm. calibre) is mounted on a standard on the bow. Its loading action is not unlike that of an oversize shot-gun. The harpoon is 4 ft. long and is loaded into the muzzle of the gun. It is propelled by an explosive cartridge. To the shaft of the harpoon is fitted a sharp triangular head filled with explosive and fired by a seven-second time-fuse which bursts to shrapnel inside the whale. Just below this head are three 6 in. barbs which lie back along the shaft while the harpoon is in flight, but which open out when the head enters the whale, fixing the harpoon firmly in the flesh. A 200 fathom line is attached to the end of the harpoon and runs back into a forward hatch. This line is used to play the whale.

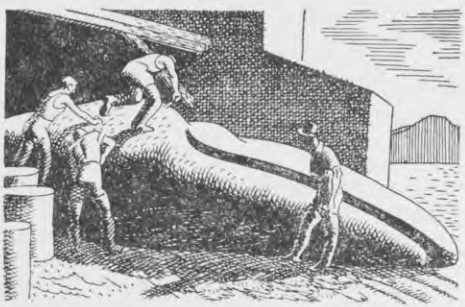
In an open look-out high above the Strait wait the crews of the chasers scanning the sea with eager eyes. Suddenly a whale spouts far away to the south. Down the cliff path the crews race, row out to their waiting chasers and roar out from the Channel into the winter sea. From the look-out directions are given to the chasers by radio-telephone, and soon they approach the whales. Yes, there are two of them, a bull whale and a cow. This is luck. Mating whales cruise close together, and if the cow whale is harpooned first her mate will stay close beside her until she is killed, thus becoming an easy mark for the hunters. But if the bull is hit first the cow will desert him immediately. It will be a matter of chance, though, which whale is attacked first. In heavy weather and with only a second or two to sight the whales, differences in sex are not easily discernible.

"There she blows!" but the chasers, too, have been spotted. Taking fright, the whales dive rapidly. A flip of the huge tails and they are gone. Over roar two of the chasers and spread out on the course they think the whales will follow. There goes the tell-tale spout again, and over speed the hunters waiting for the second "blow." Up one goes beside them, and round slew gunner and gun. With a crash the harpoon flashes towards the whale. The coils of

rope snake out behind it. Good shot! The harpoon buries itself in the back of the monster just forward of the hump. but bad luck, too! The bull whale has been hit and the fickle female has dived steeply and is gone.

Startled and pained, the harpooned bull charges off at full speed and away hisses the rope. After him goes the chaser, holding him while he surfaces, paying out the line as he dives, playing him as any fisherman plays a big fish. A half-hour of twists, turns, and dives, and the big fellow tires. The chasers close in for the kill.

Cautiously the launches edge in beside the labouring whale, and as one boat passes the gunner drives a long lance



Cutting up the carcass.

deep into the whale's back. This is a javelin of ½ in. piping with a razor-sharp head of inch piping. The head contains four sticks of gelignite and a detonator attached by cable to the launch. As the boat swings away the charge is fired and after a dull explosion the whale lies sickly on the surface.

But he is not yet dead. Neither harpoon nor bomb is intended to be immediately vital, and now the whaler must inflate the carcass with air before the death-blow is given. Again the chaser draws alongside the monster and another ½ in. pipe is driven into his stomach. This is connected to a compressor by ordinary hose-pipe, and for about four minutes air is pumped into the dying whale. Floating now quietly and safely on the surface, the whale is despatched with another bomb plunged into his neck.

The whale is now secured to the chaser and towed off to the fleet's tug, the "Tuatea," which is waiting close by. Here a wire cable is passed through its tail and it is drawn alongside the ship to be towed back to the factory.

Meanwhile the look-out, or the man in the crow's nest of the tug, may have sighted another whale, and off race the chasers again.

Only two of the boats join in the chase of a whale. One is kept in reserve in case a launch should be put out of commission, as happened when one whale pushed his nose through the bottom of the boat. The other waits until the chase is ended, when it may join the unsuccessful boat in another chase while the victor is handing over its catch.

The "Tuatea" goes out behind the chasers and waits to receive their captures. She can tow five whales at a time, and so the chasers do not have to tow the whales too far. The little boats are far more valuable in the chase itself where they consume about 30 gallons of petrol an hour. Their range is four hours.

The killing technique is peculiar to the Tory Channel whalers and has been developed and perfected by the Perano Family, who own the station. The principle is to keep the whale alive until the injected air ensures that it will float. A whale killed immediately will sink to the ocean bed, and then there is some chance of the carcass being lost. Also, if the harpoon strikes too high and enters the whale's brain the beast will go mad and become entirely unmanageable.

A long chase in the old days meant that the oarsmen might have to tow the whale for many hours before reaching the safety of the Sounds. To-day both whales and chasers are towed back to Whekenui by their powerful tug.

The busiest spot in the Sounds is the Perano Factory when the chasers are collecting a good bag. Some say it is also the smelliest.

The "Tuatea" deposits the dead whales in the bay and they are drawn by winch tail first up the slip-way to the flensing boards. Here the butchers are

waiting to cut up the carcass. Sometimes five whales are caught in one day, and the aim is to have the carcasses into the digestors and out again within twenty-four hours.

First the blubber is stripped from the whale. This is a layer of fat not unlike bacon fat surrounding the whale to a depth of 6 in. It is boiled in the digestors with the body-fat for six hours at 25 lb. pressure to produce the finest-quality oil. When the boiling is finished water is pumped into the digestors and the oil rises to the top, to be drawn off into settling-tanks.

The bones and any parts of the carcass containing fat are also boiled in huge digestors at 80 lb. pressure for ten hours to produce a second-grade oil. Only the meat containing no fat is thrown back to sea and provides a glorious meal for thousands of waiting sea-birds. This meat is edible and soldiers at a nearby camp have had whale steaks for breakfast. They say they are excellent.

In the settling-tanks the oil purifies itself without the aid of chemicals. The finest-quality oil rises to the top and as the levels descend so does the quality decrease. When thus graded, the oil is pumped into 44-gallon drums and despatched to its valuable and versatile work in the war effort of the United Nations.

About two thousand drums of oil are produced each year by the Perano Factory, and a ready market is available in both Australia and New Zealand. Last year Australia received half of the supply.

The finest-quality oil is not unlike linseed-oil in colour and consistency. Some of its many uses are — as a lubricating-oil, as a lamp-oil, in margarine, and as a calf-food. The ordinary oil is used mainly in rope-making and in tanning leather. The inferior oil, known as semi-foots, is mixed with coal-tar by-products by the Wellington Gas Co. to make disinfectant. The lowest quality foots, is used in bitumen.

The factory.

After boiling down the residue of carcass and bone is dried and bagged for use as fertilizer. From some of the bones, whale-bone brushes are made in a factory outside Blenheim.

The Perano Factory was established in the Sounds in 1909 by Mr. J. Perano, who is now in Australia organizing the establishment of whale-chasing for the Australian Government on lines similar to those adopted in Tory Channel. His two sons, who twice won the Masport Cup in their speed-boat, " Tory Chick," carry on the business in his absence.

The technique is unique and is considered the most up to date in the world. An indication of its success is given in the figures of the catches. In 1924, 7 whales were caught; last year, 90. The average is 56 whales a season, and the record catch for a season is 109.

The methods are being constantly modified and improved. The latest suggested development is the use of a sea-plane as spotter with radio communication between the plane and the ships. Though one of the brothers has his pilot's license, the idea will have to await the end of the war.

GOVERNMENT AND PRESS

Relations after the War

"Is the outspoken desire of the press for independence matched by an equal sense of public service on the part of those who direct it?" asks the *Economist* in an article on wartime press controls in Britain. Those interested in the issues raised in the article should refer back to Current Affairs Discussion Bulletin No. 6, "Newspapers and the News."

THERE ARE TWO aspects of the present campaign for an independent post-war press which require somewhat more careful consideration than has so far been given.

On the one hand there is a tendency to overstate the degree of wartime control over the newspapers. Paper is harshly rationed, and the most important news, for reasons of national security and the exigencies of warmaking, is passed through an official filter; but the expression of views, apart from a range of safeguards for the defence of the realm, which in fact have operated very far from onerously, has been quite remarkably unconstrained. With regard to the post-war period, on the other hand, too much, perhaps, has been said by the representatives of the press about what the Government must not do, and too little, certainly about what the press itself must do, if it is to discharge fully its great public responsibilities.

No Truce to Criticism

During the war the newspapers have been confronted by an array of special machinery set up to guide and instruct the public. The press has been used by the Ministry of Information and by the press officers and public relations departments of the various Ministries to explain the war and its conduct to the people; and the essential condition has been the unprecedented degree of national unity embodied in Mr. Churchill's all-party coalition Government. Control of the press, in so far as there has been control, has been one of the means to an agreed end. But, although there has been a truce to party politics in the peacetime manner, there has been no truce to discussion and criticism. Indeed, the suspension of party politics in Parliament, and, in the form of elections, in the constituencies as well, has provided the press with added opportunities and responsibilities—"to speak for England." It is for this reason that every attempt to use the Ministry of Information as a Ministry of Propaganda, or to use particular press officers as the advocates of particular Ministers, has been jealously, and on the whole successfully, opposed. On a balance of its wartime deeds and misdeeds the press has done well; more harm has almost certainly been done to the war effort when newspapers have been too uncritical than when they have been too critical.

The Facts are Complex

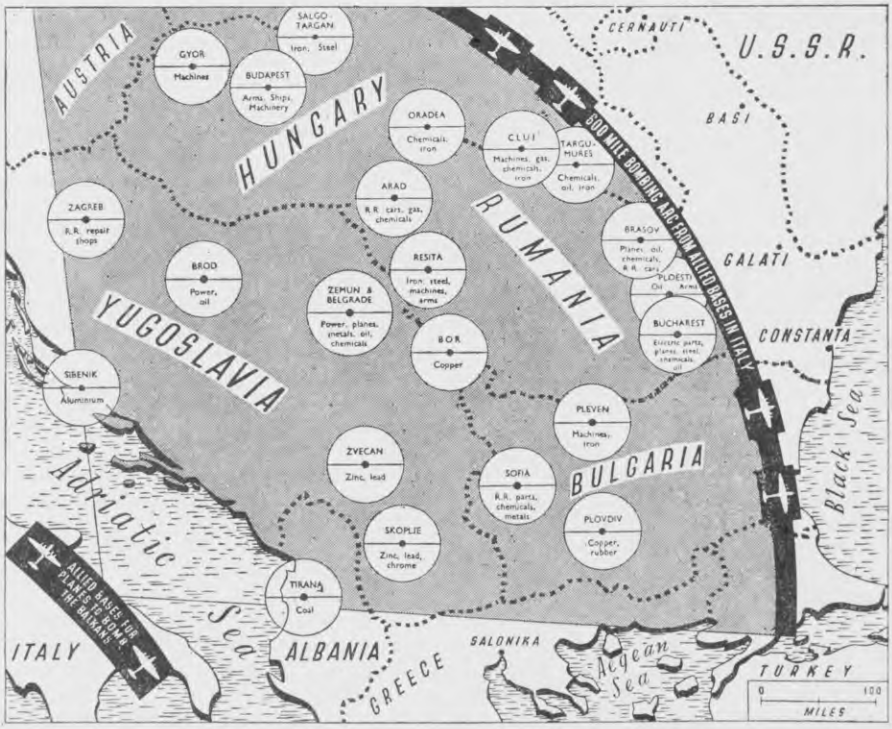
But if the press can claim a good-conduct stripe, so, too, can the Government. It is a figment of the imagination to picture the newspapers exposed to ceaseless pressure and dictation during the war; and a false conclusion to argue from this false premise that the whole apparatus of public information at present provided by the Ministries in wartime should be swept away. Modern Government, in peace or in war, has a particular need of an informed public, and therefore of an informed press, if its democratic character is to be preserved; and there are many items in the complexity of twentieth-century legislation and administration which must inevitably be unknown, inaccessible, or unintelligible to journalists no less than to the citizenry at large. The case for press officers and public relations departments was already proved before the war.

Competence is the key. There are certain informatory functions which can only be performed by Government Departments themselves; they cannot be satisfactorily carried out either by

question and answer in Parliament or by unassisted press investigations. They are functions that must be performed if the right principle of "Let the people know" is to inspire the business of government. But they must be efficiently performed. Information must be made available to the press and to the public at all the various levels of sophistication from which inquiry is likely to come; and it must be purveyed by men who know what they are doing, are anxious to do it in the appropriate way, and are acquainted with all the relevant facts, figures and explanations needed to make the information complete. There is no reason why, after the war, each Government department should not have officers capable of giving every newspaper and citizen, without prejudice, the information they want in the form they want it.

"Comment is free and facts are sacred." This phrase of C. P. Scott's has become the hackneyed slogan of the British press; and if the aim of post-war independence in the true sense is to be reached it can only be by making this slogan generally true. This is the responsibility that the newspapers will owe to the public when the wartime grip of the Government, such as it has been, is removed. It is in this positive direction that professional guidance is looked for, vainly more often than not, in the current polemics in favour of a press freed from "dictation." This is not to say that the press of this country, in comparison with others, has fallen far short of its responsiblities, in peace or in war; the reverse is true. But it is to say that the struggle to maintain high standards, in the face of proprietorial pressure, financial considerations, and the contemporary

TARGETS FOR ALLIED PLANES BASED IN ITALY



mistranslation of popularity to mean vulgarity will be hard and unending. This is an age of newspaper millionaires, of mass circulations, of the concentration of the newspaper industry, when a comparatively few men, chosen by the chances of commerce or the accident of birth, wield immense power through the vast readership of their newspapers. The process by which this has happened cannot be reversed. A newspaper is a commodity. It is produced for sale; and the newspaper shares with other products in the modern trend to large-scale organization. The quality of a newspaper is bounded—within very much wider limits, however, than is sometimes suggested—by the quality of its readers, by the standard of their taste and education and the character of their curiosity about the world they live in.

Stereotyping Public Opinion

Any attempt to impose upon the public the kind of newspapers they ought to read, according to some arbitrary criteria of taste and value, or to stereotype their opinions in order to rule out proprietorial excesses would be ridiculous and wrong, in principle as well as commercially. But the present position is that, increasingly, a handful of newspaper proprietors are themselves able to do precisely this—that is, to impose upon the public the newspapers that they (the proprietors) think they ought to read and to stereotype public opinion in a few primitive and not always very sightly moulds. Some proprietors and boards of directors do not use their power in this way; they have a high sense of public duty and a regard for good and honest journalism, and they protect their editors and staffs, within the broad limits which they naturally feel entitled to set. But more than a few behave quite otherwise. Often they own the most powerful papers; and they have their way because in the field of national newspapers, and increasingly of provincial newspapers as well, the consumer has a very limited choice; mass production, concentration, and mass advertising have done their work. The really important question is whether the outspoken desire of the press for independence is matched by an equal sense of public service on the part of those who direct it.

The Need for Editorial Independence

There is no mechanical formula by which newspapers can be made worthy of their high responsibility in a modern democracy; and a State press would be a mockery of press and democracy alike. But there are two simple rules by which the conditions might be established to allow right-minded and able newspaper men, without ignoring the commercial motives that must operate in every industry, to do their best work. The first looks backwards; it is the old tradition of the best age of British journalism, summed up in C. P. Scott's phrase—the treatment of news honestly, accurately and objectively, distinguishing, as the editor of *The Spectator* has recently urged, between the important and the trivial; and the rigid, punctilious, unvarying separation of news from views, whether editorial or proprietorial. The second looks forward. Is it too much to expect that the great magnates of the newspaper world, some of them already deeply conscious of their duty to the community, may be prepared, while surrendering none of their proprietorial control over the balance-sheet, to abate their control over editorial policy? As has been said, some boards and proprietors have, in effect, done so already. This is the right road; but more is needed to give the assurance that is needed. The goal should be the general restoration of the conditions of virtual independence in which the best of British editors have flourished; and the best means, undoubtedly, would be the general setting-up of boards of independent trustees, to hold the proprietors' powers of control in commission, to oversee and protect editors and their staffs, and to reconcile divergences between editorial and commercial considerations.

NEW ZEALAND ROLL

By 467356

How long have we been waiting for that ship? Six days? Seven? Eight? We've almost lost count. But it doesn't matter. We're among the lucky ones. Some of the boys have been waiting three weeks.

There's still no news of a ship to take us home. Rumours in plenty, of course. Going to-morrow, next week; no more ships for a month. A fellow has just come in from Base and he says . . . We know these stories for what they are; we've heard them so many times. And yet we consider each one again in detail. After all, there is the faintest hope that they might have some foundation in fact, if only we could find the fact.

This waiting wouldn't be so bad if it weren't for the mossies, and this accursed alternating rain and heat, and this drab alien landscape. At least, that's what we tell ourselves. For hours the sun has been beating down from a cloudless sky and the earth throbs like an inflamed spot in your flesh. And we're so tired of all that. The pleasant things just now are the things that don't belong in this place, perhaps a sight of snow, fields in the plains, sheep, and houses in rows and squares.

That's what we tell ourselves. The truth is partly, of course, that we're tired of picking up sticks on the football-ground and messing about in similar odd jobs. The climate isn't really so bad and we can put up with the mossies. But right now we know we're going home and we want to get cracking.

"You know," says Blue from the folds of his mossie-net, "the first thing I'm going to do when I *do* get there is have a hot bath. I'm going to lie in it for hours and hours. Just soak. It's eight months now since I had a hot bath."

"Yeah?" says Shorty. "Well, that can be second for me. First on my list is a good feed of steak and eggs. Or egg, as I believe it is these days."

"You fellows remind me of the bloke in the story," Charlie says. "You know, the fellow who was going home from the last war——"

But he has no time to tell us that one. From the head of the lines comes the voice of the R.S.M., raised to its highest pitch:

"New Zealand roll, fall out!"

And that is one order the R.S.M. doesn't have to give twice.

* * *

In our tent, eight mossie-nets are flipped back together and eight men tumble out into the brilliant burning light. Men are hurrying down the line in dozens. They are hurrying on crutches, with walking-sticks, with their arms in plaster and slings. One has a bandage round his head. Some, like the fellows in our tent, show no signs of the injury or illness that is taking them home. They have skin-diseases. Or perhaps they've had more fever than they can stand.

"All right, men," the R.S.M. says. "You're leaving for home at half past

one." He looks at his watch. "It's ten past now, so you've got twenty minutes to pack your things and get your beds and anything else you've drawn back to the Q.M. store. I want everybody over by the trucks with gear at one-thirty. Is that clear? All right. Go to it."

And we go to it with even greater speed than we obeyed his first command.

"This is it, boys!" Blue shouts as he tears down his mossie-net. "We can count the days to N.Z. now!"

"I wouldn't be so sure," says Charlie. "We're not on the boat yet. And I've seen homers before to-day slipped up at the last minute. Boat delayed, or something like that."

But nobody takes any notice of Charlie. Nets are ripped down, beds folded and dragged off to the Q.M. store.

Dad—we call him Dad because he's forty-one—upends his wine-bottle and gulps down the last few mouthfuls.

"I've been saving that drop for this," he says, and as he wipes his whiskers he sends the bottle crashing into the tin outside the tent.

Nobody ever loaded kits on to trucks faster than we do now. They're tossed up like featherweights and thrown into some convenient space.

"If the M.O. could see us now!" Blue chuckles in the middle of it all. "We'd be Grade One again pronto and out in the bull-ring again!"

* * *

As our names are called we climb into the trucks.

"Lucky blighters!" says someone down below. The whole camp must be here, standing round the trucks. Messages are shouted back and forth and handshakes exchanged. And while all this is going on the leading truck moves off.

But then we see the R.S.M. come dashing from the Transport Officer's tent. Instinctively we feel that something's wrong. And very soon we know.

"Stop that truck!" the R.S.M. yells, as it disappears round a bend. "Stop that truck and bring it back!" And in a second or two the whole camp is yelling: "Stop that truck! Stop that truck!"

The O.C. confers with the R.S.M. Other officers join these two. A decision is made.

"All right," says the O.C. "You will leave the trucks. Officers will go to their lines and men to the Y.M.C.A., and you'll stay there until you get further instructions. Leave your gear on the trucks."

"What'd I tell you?" Charlie says fiercely. He's anything but exultant. Being proved right does not assuage his disappointment. "I bet we don't get away to-day."

The men murmur impolite comments as they slowly climb down and go to the Y.M.

"I suppose we might have known," Blue says with angry disgust.

* * *

We've been waiting in the Y.M. an hour now; and here at last come the O.C. and the R.S.M.—under the trees across the bridge. A pretty decent figure of a man, the O.C.; what is so often called the "athletic" type; and so, unlike some others, he doesn't look out of place in his tropical kit.

He stands on the stage in the Y.M. and rests his hands on one of the low rafters.

"Gather round, men," he says. And as we crowd on to the stage he explains:

"Now, I don't want you to go away and say: 'The Army's messed us up again.'"

"We know, we know," several of the men interject. "We're not going."

"Listen, men. As you know, we're dependent on our Allies for shipping to get us in and out of this place. We haven't any ships of our own up this way. Now, we had a message to say you were to be ready to embark on a certain ship to-night and then we got another message saying not to send you to-day. Why the cancellation? We don't know. Maybe there are subs outside; maybe the ship has to go somewhere else. On that point your guess is as good as ours. But I think we can assume that you won't be going to-day; so you can get your gear out of the trucks and set up home again. But don't get your chins down, men. Lots of us wish we were as close to getting out of this place as you fellows are."

* * *

And so this waiting business begins all over again. All the old stories, all the old songs; the same comments and complaints; the same jobs—clearing the football ground and messing about elsewhere. And that's what we're so tired of.

We go on waiting for another seven days. And on the morning of the eleventh day we sail into Auckland Harbour. The sun is rising behind Rangitoto and lighting the sky with the clear promise of a brilliant day.

We crowd at the rails and watch. We are all quiet now. Few of us say what we are thinking. But probably, in his own inarticulate way, the sergeant standing next to me sums things up pretty well.

"Well, now," he says, as he looks at Rangitoto and the rising sun, "I've only been away from New Zealand for nine months but—well, isn't that just the goods?"

PRIZES OF £500

Literary Competitions for the Services

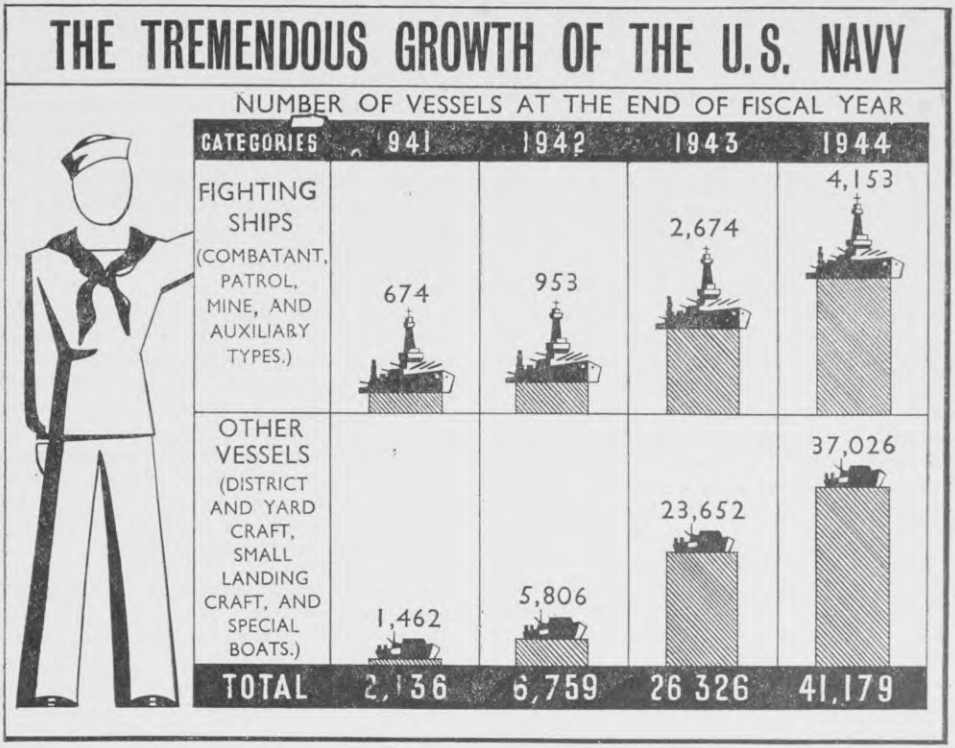
To celebrate one hundred years of publishing, Macmillan and Co., Ltd., London, publishers, are offering special Macmillan Centenary Awards for men and women in the armed forces of the British Empire and the United States of America.

Each of the principal awards will be £500 payable to any British-born man or woman between the ages of nineteen and thirty-five serving in any branch of the armed or auxiliary forces of the British Empire, or a similar award of 2,500 dollars to any American citizen between nineteen and thirty-five serving in the American armed forces. One £500 prize will be for the best novel, and other £500 prizes will be for the best book of biography, for the best book of autobiography, for the best book of essays, and for the best book of belles-lettres.

In addition to these special awards a number of smaller awards totalling £1,000, or 5,000 dollars, will be made for other manuscripts or publishing proposals at the discretion of the publishers. All the awards are outright payments and are in addition to the usual royalty payments to authors.

Manuscripts do not necessarily have to be complete. A partial manuscript may be sent in with a synopsis of the rest.

Entries from New Zealand servicemen and servicewomen stationed in New Zealand or the Pacific may be sent to DAEWS, Army H.Q., Wellington, with the coverings clearly marked "Macmillan's Literary Competition." They will then be sent forward. The closing date is December 31, 1944. All entries must be in the offices of Macmillan's by then, so the closing date in Wellington will be considerably earlier. A definite date will be advised later.



TOO HIGH FOR HUMANS

By PAUL W. KEARNEY, in *This Week*

When a Flying Fortress climbs "upstairs," its crew moves into a new world—they could'nt stay alive there without scientific miracles to protect them

IT SEEMS strange that gasoline will boil away at 65° below zero.

Yet until the engineers figured out that one, and a thousand other sub-stratosphere problems, our Boeing Flying Fortresses couldn't function at modern combat altitudes—and men couldn't live long enough to fly them up there. Thanks to ingenious research, however, scientists have so minimized the hazards that the stratosphere has become not only to-day's aerial battlefield but will be to-morrow's trade and passenger route for civil planes.

Nevertheless, life is different away up yonder where a man can't whistle and a hairy bass voice becomes disconcertingly falsetto—where a fellow who is stiff with the punishing cold can be sunburned to a crisp at the same time—where two hours sitting in a comfortable padded chair will exhaust you—where your blood is liable to fiz like ginger ale.

Such is life in a region where there isn't enough oxygen to support a candle flame—and where the better you feel, the nearer you are to death. For although we laymen have become as blasé about altitude figures as we have about billion-dollar budgets, 40,000 ft. is still alien territory for man.

Notwithstanding this, an R.A.F. flyer in a Spitfire shot down a JU-86 last November from above 40,000 ft., while two others scored victories over Junkers planes flying at 50,000 ft. although the men were virtually paralysed by cold.

To appreciate flying at such heights we must begin with the fact that at sea-level we live in an air-pressure of 14.7 lb. per square inch; in other words, we have about 30 tons of air holding our bodies together. But at an altitude of 40,000 ft. it drops to a mere 2·17 lb. per square inch, meaning that the air is six times as "rare" as at sea-level. Which complicates everything. For example, a 1,000 horse-power engine tuned for sea-level won't deliver 200 h.p., at that height. And since a man's "carburettor" can't function any better than an engine's on such a thin diet of oxygen, the first hazard of the Flying Fortress crew is anoxia, or "oxygen starvation," a threat virtually eliminated by the elaborate but fool-proof oxygen equipment provided.

Much like intoxication, anoxia first dulls the senses, then affects the judgment; consequently you are blissfully unaware of your condition as you go from bad to worse. After one-half hour at 18,000 ft. the typical victim's faculties are sadly impaired, yet he is feeling great. He can't do simple arithmetic problems; his handwriting deteriorates into a scrawl, yet he'll be making silly faces at nothing and giggling like a schoolgirl. If you stay at 18,000 ft. for more than a half hour (without oxygen) you begin to see double and you are so deaf you can hardly hear the motors roar; so ossified you can drive an ice pick through your hand and hardly notice it; so senseless you can't distinguish between the tastes of mint and onion. Fits of boisterous laughter or blind rage may seize you. On an early test flight to 20,000 ft. without oxygen, one fellow was on the verge of killing the pilot because the latter's red neck infuriated him beyond reason. The only thing that saved the pilot's life was the fortunate fact that the passenger couldn't find a weapon with which to bash in his head.

You can't even whistle

Up to a certain point anoxia can be combated by breathing oxygen from an ingenious face mask connected to a supply tank. Thus, at 10,000 ft. the flyer will adjust the valve to give him 30 per cent. oxygen, making up for the deficiency in pressure. At 20,000 ft. he will increase the ratio to 50 per cent.—at 33,000 ft. he will have to breathe pure, 100 per cent. oxygen.

From here on up, however, even 100 per cent. oxygen is not sufficient in itself; it must be administered under pressure so as to drive it into the blood stream. This means either a pressure suit or a pressure cabin such as is used on the Boeing Strato-liners with such success. It is this lack of pressure which makes it impossible to whistle (there being no back-pressure against the lips); or which pitches male voices so high.

Not only must oxygen be available for men at their fixed posts, but also for those moving about the ship and, in an emergency, for those who may have to resort to their parachutes. Each Fortress crewman carries his own "bailout bottle" containing a 15-minute oxygen supply. If he has to "hit the silk," he will disconnect himself from the main tank and slip on his emergency mask (worn around the neck) which is hooked up to a 2½ lb. bottle in his trouser leg.

Another worry of the Flying Fortress crews is aeroembolism or "stratosphere bends." Caused chiefly by the release of nitrogen bubbles in the blood stream and tissues, the simplest analogy is the way ginger ale fizzes when you uncap the bottle; the room pressure being lower than that in the bottle, the gas escapes in bubbles.

You become a Ginger-ale Bottle

In a rapid ascent to 30,000 ft. the human body virtually becomes a bottle of ginger ale, and as outside pressure decreases, nitrogen in the blood turns to bubbles. Generally unnoticeable at 18,000 ft. they get so big at around 30,000 ft. that most people suffer from them, and the agony may become unendurable.

Fortress crews combat this hazard by breathing 100 per cent. oxygen as they exercise moderately for about a half-hour before taking off. In this fashion as much as 95 per cent. of the nitrogen in the system can be eliminated and the danger obviated.

Fatigue is another concern of the high-level bombers; it is so acute that a man can only stand about two hours a day regularly in a sub-stratosphere. And, on top of this, cold is probably their most punishing handicap, since temperatures "upstairs" drop about one degree for each 280 ft. above sea-level. This means that you can count on its being around 12° below zero at 20,000 ft.; 48° below at 30,000 ft.; 67° to 102° below from 35,000 ft. on up—even over the Equator!

Such cold dulls the senses so that at 40° below a man is only about 13 per cent. efficient. Planes are heated, of course, but when the bomb-bay doors and hatches are opened in action, cold air streams in at several hundred miles an hour. The electric flying suit seems to be the solution. But until it is more widely available, your typical Fortress crewman wears up to 50 lb. of clothing and gear—which is something if you're taking off in a ground temperature of 100° in Africa!

Naturally, there are numerous other problems involved in getting away up yonder—metals contracting, lubricating oil turning to foam, electric sparks jumping bigger gaps in rarefied air, gasoline boiling as atmospheric pressure drops, &c. Many of them have been encountered first in actual operations; others in ingenious pressure chambers which permit engineers on the ground to simulate any altitude conditions.

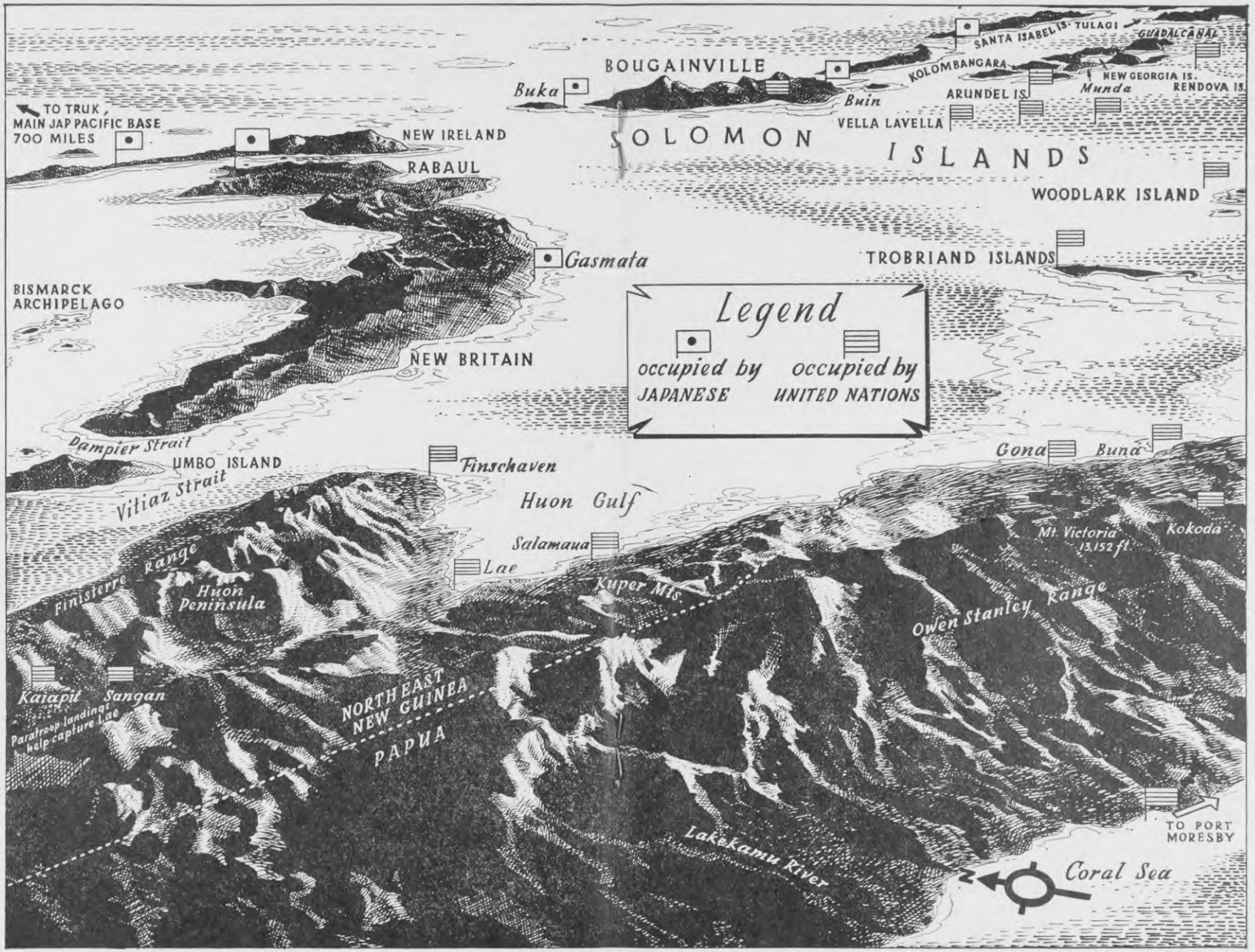
The advantage of the new devices is dramatized by the case of a Fortress pilot whose oxygen supply failed at 35,000 ft. during a formation flight. Without warning, he suddenly ran amuck among the other ships in the squadron, weaving in and out like a drunken driver. Nothing but the skill of his fellow-pilots enabled them to avoid a crash until his co-pilot got the ship under control.

Even among such fine physical specimens as Army airmen, individuals vary greatly in their susceptibility to anoxia, aeroembolism, even low temperatures. Just as the bomber pilot and the fighter pilot must have different temperaments, so must the high-altitude man have physical qualifications different from the ordinary flyer—qualifications we are just beginning to learn. Other things being equal, for example, it appears that a short, stocky fellow is less liable to "black out" in the recovery after a dive-bombing operation than is a tall lanky pilot. The latter, on the other hand, will probably have a higher tolerance for anoxia.

Altogether, aviation physiology has a fascinating field ahead of it on the job of picking the men best qualified to withstand conditions away up yonder. And next time you read about a successful raid of American high-level bombers make a note that it has taken much more than an uncanny bomb-sight to produce that skill!

[*Official Photo.*

Land girls with the N.Z. Forestry Unit in England measuring the girth of a felled tree.



Terrain map (not to scale) showing Rabaul in relation to the Allied advances in the Solomons and New Guinea. Since this map was made Allied forces have landed at Cape Gloucester, at the south-western end of New Britain, and Arawe, west of Gasmata.

A YEAR OF CURRENT AFFAIRS

By a KORERO Staff Writer

THE first issue of *Korero* (A.E.W.S. Background Bulletin in its new form) marks as near as need be the first birthday of Current Affairs Branch A.E.W.S.

The branch consisted at first of three men (two journalists and a librarian) with the use of half a table—A.E.W.S. headquarters was still in the hands of carpenters. Publication date was two months off, and in that time we had to get supplies of paper, make arrangements with a printer, choose a list of subjects, decide on a format, and work out a scheme of distribution.

At first we were shooting in the dark. No one knew in advance what sort of subjects men would be willing to talk about, or what style of writing would go down with the Army. Luckily, the second shot fluked the target. "Our Population Problem" was an immediate success as a discussion bulletin. It showed hundreds of apprehensive platoon officers that men could and would talk sensibly about social problems.

Some of the bulletins we worked hardest at were the biggest failures as discussion material. "War in Russia" was an early production because the report was—these were the days of Stalingrad—that the men were interested in Russia. The report was right; our response was wrong. "War in Russia" was an excellent short account of the fighting in Russia to that date, probably as good a short account as had appeared anywhere. As discussion material it was almost useless because, although it answered many questions, it raised hardly any that the ordinary soldier felt competent to discuss. Incidentally, soldiers have very clear and precise ideas about what they can discuss, and greatly dislike venturing opinions which take them outside their field of knowledge. They know what they know.

If the Discussion Bulletin is now—in arrangement of material, choice of subject, style of writing, method of framing questions—a reasonably satisfactory instrument, that is because, perhaps for the first time in adult education, there has been an efficient system of reporting back. We have, as it were, built into the bulletin the comments, suggestions, and criticisms of hundreds of E.O.s and U.E.O.s here and in the Pacific.

Before we could do this we had to learn the difference between relevant and irrelevant criticism. The first bulletins were popular with officers because they were a novelty and were well printed. They were judged as reading-matter for a spare quarter of an hour. Criticism on that basis is worth little because the discussion bulletin is meant for discussion. Only the man who has taken a discussion bulletin with a group, or watched others at the job, has a useful opinion on its merits.

We are sometimes asked how long it takes to bring out a discussion bulletin. The answer is six weeks to three months. That surprises most people, because you can read through a bulletin in a few minutes. Chesterton once wrote to a friend: "I am sending you a long letter because I hadn't time to write a short one." The discussion bulletin would be much easier to write if it were twice or three times as long. What takes time is deciding what to leave out and looking for simple and short ways to get over complicated ideas. The early bulletins suffered from over-compression; after reading one you felt like a man who had eaten his three days' emergency ration at a meal. We have had to learn to be brief without being congested.

Then there is the collection and checking of facts. The man who assembled the material for "Women and the War" visited these persons and institutions: W.A.A.C. H.Q.; W.A.A.F. H.Q.; W.R.N.Z.N.S.; W.A.A.C. Camp, Miramar; W.A.A.C. Publicity Officer, Wren Establishment near Wellington, Director of Army Nursing Services;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THE JAPANESE
CHINA AT W

Director, W.W.S.A.; Director of Nursing, Health Department; S.O. Overseas W.A.A.C. personnel, Army H.Q.; National Director, Y.M.C.A.; Director of Women Personnel, P. and T. Department; Director of Women Personnel, Railways Department; Public Service Commissioner; Secretary, Department of Labour; Officer in Charge, Women's Land Army; National Service Department; Wellington District Office, National Service Department; Clerk in Charge of Staff, Wellington Tramways.

Then the real job began—the job of writing four thousand words from material which would have made a large book. "Women and the War" was written and rewritten three times.

"What results are you getting?" That is another frequent question, and it is still too early for an answer. But when this matter was discussed by the E.O.s during the recent course at the Army School of Instruction it was agreed that there is often a sort of delayed action effect. A promising discussion can peter out because the group leader has mishandled it, but in a few hours it will suddenly revive in a hut or a camp institute. More than that, the ideas which a bulletin tries to get across will sometimes germinate in men's minds before becoming active. That was the case with "Exploring Discussion." As discussion material, this bulletin was voted hopeless by most platoon officers; nevertheless, lecturers and discussion leaders were startled weeks afterwards to be told severely that they were using "emotive language."

One discussion bulletin a week was the original programme. The unanimous verdict of E.O.s and U.E.O.s, after a brief trial, was that one discussion bulletin a fortnight would be ample. At the same time there was a general demand for a bulletin of general reading related to discussion bulletin topics. The background bulletin was the response to this need. It is now doubled in size, because the reading-matter you can pack into sixteen pages is just enough to start an appetite. It has also been given a name, because henceforth it will be something more than a selection of reprint material about the war and international affairs.

Official War Photo

Memories of home in the Middle East.

●

£2,000 FOR A NOVEL

Hutchinson's Literary Competitions

HUTCHINSON and Co., Ltd., publishers, London, are offering prizes of up to £2,000 in a literary competition. The prizes include £1,500 for a book of autobiography, war experiences, or travel. They are offered in these categories:—

- £4,000 in two prizes of £2,000 for novels, at least one prize to be for a work in a foreign language.
- £1,500 for a book of autobiography, war experiences, or travel.
- £1,000 for a detective novel or thriller.
- £1,000 for a history or biography.
- £500 for a book of essays or belles-lettres.
- £500 for a book of verse.
- £250 for a children's book.
- £250 for a book of general or religious philosophy.
- £500 for a scientific or technical work.

Authors' names will not be divulged to the judges, and competitors are asked to use a pen-name on the title page, but to attach a sealed envelope with the author's real name and address.

All MSS. must reach the publishers office, 47 Prince's Gate, London S.W. 7, by June 30, 1944.

[*Official War Photos.*

A party of New-Zealanders in the Middle East visited the stronghold of a tribe of bandits. The bandits had somehow acquired a Rugby football and in these two photographs the New-Zealanders are showing them how to use it.

TURKEY

By a KORERO Staff Writer

SHORTLY after the historic meeting of Mr. Churchill, President Roosevelt, and Marshal Stalin in Teheran, Mr. Churchill and Mr. Roosevelt conferred for three days in Cairo with the Turkish President and Foreign Minister. Although overshadowed by the Teheran meeting, this conference attracted much attention in Britain and America.

Turkey is to-day the most important neutral, and a glance at the map on the next page will show why. In the first place, she is the guardian of the straits connecting the Mediterranean with the Black Sea. The Russian campaign, particularly in the south, might have run a different course if the Axis had had free use of the Straits for their war vessels. Equally, it is desperately necessary for Germany to make sure that similar use of the Straits is denied to the Allies.

That is the main reason why the Germans threw so much weight into the counter-attack which dislodged Allied invasion forces from the Dodecanese islands. These islands are a screen round the entrance to the Dardanelles.

A second reason for Turkey's importance is that the north-western corner of her territory is a bridge between the Balkans and Asia Minor. If Turkey had not stood firm in the disastrous days of April and May, 1941, when Germany invaded Yugoslavia and Greece, the German armies would have poured south into Syria and Palestine, seized the great oilfields of Iraq, and made the Allied position in North Africa untenable. Then German propaganda was trying to persuade Turkey that neutrality was against her national interests and that she must take sides or forfeit her right to a voice in the affairs of Europe. To-day German propaganda anxiously extols the wisdom of Turkey's neutrality policy, because Turkey now holds one gateway to the Balkans, and along her southern frontiers are the Allied 9th and 10th Armies.

The outcome of the talks between Allied and Turkish leaders is not yet known. Most British and American newspapers take the view that Turkey's entry into the war is unlikely—for the present at any rate.

Some newspapers, however, point out that Sweden, although maintaining her neutrality, allowed Germany the right to transport troops across her territory. This, they suggest, might be a precedent for Turkey.

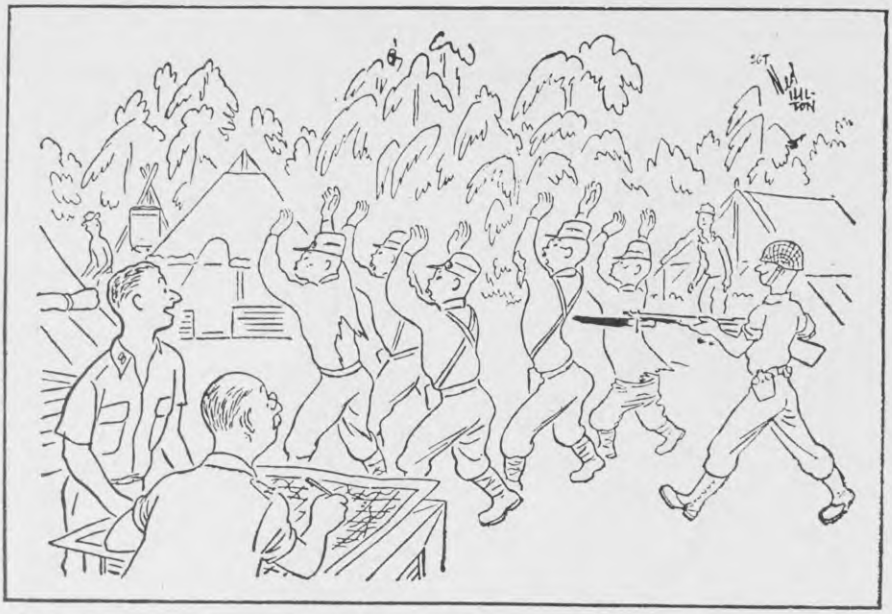
One incidental result of the talks at Ankara has been a marked improvement in relations between Turkey and Russia. Traditionally, Turkey has been suspicious of Russia because the Straits are for European Russia a vital outlet for her commerce. Several times during the present war the Turkish press has shown acute anxiety over the question of the part Russia is likely to play in eastern Europe.

Turkish-Russian relations became acutely bad in the early part of 1942, when two Russians holding official positions in Istanbul were sentenced to twenty years' penal servitude for alleged complicity in an attempt to assassinate the German Ambassador, von Papen. The recent improvement in Turkish-Russian relations means that the United Nations have got past one of the main obstacles to a satisfactory post-war settlement in eastern Europe.

Though a neutral, Turkey has suffered severely from the war. An army of 500,000 men has been continuously mobilized; universal military service has been extended to three years; the navy and the air force (thanks to British and American aid) have been expanded; and the output of war industries has been increased. Shortage of labour has affected food-production, and bread is severely rationed. There are also restrictions on industries producing luxuries and non-essential goods.

Sketch Map of Turkey

Main Railways —— Main Roads ..... Oil ▲ Oil Pipe Lines ▬ Aerodromes ✈ Scale in Miles 0 50 100 150



" Notice how much better Thatcher is doing since I took him off a regular salary and put him on piece-work rates ? "

PENICILLIN

Penicillin is a new anti-bacterial drug effective against the same disease germs as the sulfonamides and approximately as rapid in action. Clinical results with this drug have been described as startling, but the drug is not yet available either to the general public or to the medical profession, and, according to the American magazine, *The New Republic*, from which this article is reprinted, there is little hope of adequate supplies for some time to come.

PENICILLIN (pronounced, incidentally, with a soft c and the accent on the third syllable) is so named because it is produced by the fungus, *Penicillium notatum*. The drug was originally discovered in 1929 by Professor Alexander Fleming in St. Mary's Hospital in London.

Dr. Fleming happened to observe that when a mixed growth of this particular mould and various species of germs were grown together on a culture-plate the bacterial-colonies kept at a safe distance from the fungus. From this observation he deduced that the mould must exude some substance inimical to the well-being of bacteria.

By growing the fungus on a somewhat larger scale he demonstrated not only the truth of this inference, but that the substance concerned was far more potent than any bactericide previously uncovered. His difficulty, which finally proved so insuperable as to lead him to abandon his research, lay in the fact that he was unable to extract penicillin in anything like pure form.

This catastrophic ending to a brilliant piece of research was eventually retrieved in 1940 by a group of scientists working at Oxford University under a grant from the Rockefeller Foundation. Labouring under such handicaps as only a state of war can impose, this group succeeded, despite all obstacles, in isolating penicillin in solid though still somewhat impure form.

This chemical triumph was rapidly overshadowed by the astonishing clinical success which came hard upon its heels. In the main, first experiments were confined to patients suffering from suppurative disease which had proved resistant to sulfonamides and which by all known standards might be deemed hopeless. Injection of penicillin into the veins of these patients not only proved entirely harmless, but brought about astonishing improvement in their clinical condition.

Unfortunately, although many of these previously hopeless cases rallied to the point at which recovery might have been expected, supplies of penicillin proved inadequte even for the cautious dosage which was being employed.

In the autumn of 1941 Professor Howard W. Florey, who had occupied a leading position in this penicillin research, visited the United States. As part of his itinerary he visited the Peoria Laboratory of the United States Department of Agriculture, where subsequent studies have revealed many of the growth characteristics of the mould and have gone a long way toward further purification of the active substance.

However, even more important was the fact that Florey's visit succeeded in interesting potential manufacturers in the production of penicillin for clinical trial. Outstanding among these manufacturers has been Merck and Company, Inc., of Rahway, New Jersey, which has not only produced sizable quantities of the drug, but has greatly developed its method of production.

With the entry of the United States into war, supplies of penicillin for clinical trial came under Government control. Dr. Chester Keefer, acting under the ægis of the Committee on Medical Research, was appointed to supervise the distribution of the drug for medical investigation. Under his guiding hand extensive experimentation has been conducted, the details of which are still largely undisclosed. However, it is now obvious that penicillin is a discovery of as great importance as that of the sulfonamides.

In general, penicillin is effective against the same disease germs as are the sulfonamides and is approximately as rapid in action. It should be added that whereas the sulfonamides are at their best in the early invasive stages of disease, penicillin seems more or less indifferent to the stage to which the infective process has progressed.

Furthermore, while the action of the sulfonamides is neutralized by the presence of pus, the effect of penicillin seems undisturbed either by its presence or absence, and hence it can be used effectively in many cases, such as deep-lying bone abscess, in which the use of the sulfonamides would be futile.

Like the sulfonamides, penicillin can be applied locally to diseased tissue with the additional advantage that, unlike the sulfa-drugs, in cases of meningitis it can be injected with safety directly into the fluid surrounding the spinal cord. Used directly on ulcers, on infected fingers, in septic wounds penicillin has produced results which leave no doubt as to its superlative efficacy.

Moreover, from present indications it appears that penicillin will be effective against a wider variety of bacteria than the sulfonamides and will prove an effective agent in most varieties of sepsis, in pneumonia, gonorrhœa and certain forms of meningitis.

The bugbear that has now to be fought is underproduction. Army and navy hospitals are absorbing present supplies and could utilize many times the quantity they are now taking. With present methods of production, it seems unlikely that adequate supplies for civilian use will be available for months or possibly years. Synthesis of the drug seems at the present time remote, but there is hope to be found in the fact that manufacturers are engaged in a race against time and against one another in attaining this objective, the achievement of which would almost certainly bring the drug within the reach of the practising physician.

THE FRONTS IN CHINA

How strong are the Japanese Armies?

By GUENTHER STEIN, in the *Far Eastern Review*

ACCORDING TO CHINESE ESTIMATES the over-all strength of the Japanese Army consists of almost one hundred regular divisions averaging less than 20,000 men each, plus several dozen reserve divisions in different stages of recruitment and training.

Of this total, the largest single group is in Manchuria and Korea. A reinforcement by six divisions during March and April of this year has brought its strength to about thirty-nine divisions, including the special Japanese frontier and railroad guards. The China theatre still ranks a close second, with an unchanged total of about thirty divisions.

The Pacific Island theatre, including the Dutch Indies, New Guinea, New Britain, Timor, the Philippines, &c., is supposed to have at present about eighteen divisions of Japanese troops. In the Burma-Malaya-Thailand-French Indo-China theatre, Japanese forces have at least ten divisions. This would seem to leave only a few regular and several dozen reserve divisions in Japan proper and Formosa, a considerable reduction as compared with the latter part of last year.

Japan's Puppet Troops

The total of Japanese puppet troops and auxiliaries has been diminished by frequent defections to about 100,000 men. The additional 300,000 Chinese puppet soldiers, whom the Japanese are now conscripting, training, and equipping with arms formerly captured from British and American forces, are to be ready for action within one year. They are not, however, to serve in China, where contact with the National armies and guerrillas makes the puppet troops completely unreliable, but are to be used for the defence of Japan's conquests in the South-western Pacific, and probably to some extent in Manchuria. This opinion would seem to be confirmed by an analysis of the present distribution of Japanese troops over the main part of the China theatre.

The North-western Front

North of the Yellow River the Japanese are at present maintaining about nine infantry divisions, eleven independent brigades, and one cavalry group brigade. The north-western front extends from districts near Peiping through parts of Hopei and Chahar into the inner Mongolian province of Suiyuan, and reaches southward in varying depths into Shansi, Shantung, and Northern Honan. The Japanese seem to ascribe to this area considerable importance not only for their general position in China, but for their international strategy as a whole, on account of its situation on Russia's outer Mongolian flank.

Japanese forces have, therefore, continued in recent months to launch occasional raids against small Chinese troop concentrations, especially southward across the Yellow River from Paotow, apparently with a view to securing their own rather weak points. But their efforts at consolidation, undertaken with small units, partly consisting of Mongolian puppet troops of doubtful loyalty, have been unsuccessful. The Chinese in that area are on the whole, able to offer adequate resistance, since they continue to be in direct contact with the main body of Free China via Suiyuan, Shensi, and the distant western provinces of Ninghsia and Kansu.

The second front, adjoining the first to the south, covers the entire area within the wide Yellow River bend—that is, the bulk of Shansi and a small part of Honan Province. To the west and south the Japanese positions at that front are completely surrounded by Free Chinese territory. The main line across which Chinese and Japanese outposts have been facing each other

for almost four years is the Yellow River itself down to the city of Kaifeng, which has long been in Japanese hands. The enemy has for a considerable time made no serious and sustained attempt to cross the river at points in southern Honan.

Fighting in Taiheng Mountains

However, a considerable effort is at present going on to consolidate Japan's inner positions within the Yellow River bend by relatively large mopping-up operations against the great and compact area of resistance and counter-attack in the Taiheng Mountain Range. Here guerrillas of various inner political complexion are still supported by units of regular Chinese troops. Several Japanese divisions fighting in dozens of small columns, and recently co-ordinated and generally aided in their diffuse action by several scores of reconnaissance planes, fighters and bombers, have been concentrated against these mountain strongholds, so far with limited success.

This is the only important military operation at present taking place in China. The main aims of the Japanese in the region seem to be to strengthen their western flank against the Soviet Union, and to remove the constant danger of Chinese guerrilla raids in areas where they are endeavouring to exploit valuable coal and iron resources.

The third front, north of the Yellow River, borders on the first and second to the east. It comprises Peiping and strips of the land along the railroads from Peiping, northward to the border of Jehol Province, and southward to the

narrow corridor formed by Hopei Province between Honan and Shantung. This sector has no direct contact with Free China, and whatever sporadic fighting has recently been going on there was purely of the nature of guerrilla attacks and relatively weak Japanese counter-measures. The task of the small numbers of Japanese and puppet troops of guarding some 400 miles of vital railroad lines has evidently not become any easier in recent months; and it has so far been impossible for them to withdraw any troops from this area, although it is a great distance behind any actual fighting fronts.

The Fourth Front

The fourth front, extending over the coastal area of Hopei and part of Shantung to the Yellow River, has also more than indirect communications with Free China through the numerous wide gaps between the Japanese lines along the main railroads and highways. The enemy still has a hard time defending himself against the guerrillas and mobile bands of regular troops, even around strongly garrisoned cities like Tientsin. Recent attempts on a rather large scale to mop up the guerrillas in Central Shantung have once more proved completely unsuccessful. This is the main area where numerous puppet units in recent months and years have either defected to the National Army and the guerrillas, or at least have given them considerable tactic support.

The huge second region of Japanese occupation along the Yangtze has at present only about nine Japanese divisions and seven independent brigades. It extends from Shanghai and Hangchow westward via Nanking and Hankow to Ichang, the nearest Japanese position to Chungking, and covers part of the provinces of Kiangsu, Chekiang, Anhwei, Hupeh, and Kiangsi. This front contains most of the potential Japanese spearheads for further expansion into Free China. The western half of these Japanese positions is practically surrounded by Free Chinese territory, because of the huge gap between the Yellow River and the Yangtze front, consisting of most of Honan Province and part of Anhwei, which are occupied.

In view of this situation the strength of the Japanese garrison at this most important of all the China fronts is by no means imposing. It is here that the Japanese are facing the strongest regular Chinese forces. The mobile Chinese units and guerrillas between the main concentrations of the Japanese are relatively strong and enjoying somewhat better supplies than their comrades co-operating farther in the rear. Whatever action takes place in China during periods of a general lull is chiefly on this front, and the last few months have been no exception to this rule. In some cases the Chinese have taken the initiative on a small scale; but usually it is the Japanese who are tempted to advance beyond their semi-permanent positions and their lines of communications, in order to break up Chinese troop concentrations, and at the same time to forage in the adjoining wealthy rice-producing areas of Free China.

Communications

This front sector has an extremely well developed system of railroad, river, lake, and highway communications, over which fairly large bodies of men can be collected quickly for action against objectives like the coveted city of Changsha, the area between Ichang and Chungking, or air bases from which attacks against Japan might eventually be launched. Therefore Japanese troop movements within this sector are always followed by the Chinese with the greatest watchfulness. But no major Japanese concentrations have taken place recently, and the front as a whole shows no indication of imminent change.

The remaining two China fronts are completely isolated enemy outposts, but are also potential spearheads for further expansion into Free China. The southern coastal front, in Kwangtung and small parts of Fukien Province, is at present being held by no more than one division, three brigades, and a few small isolated units of Japanese troops, with only a few puppet auxiliaries. These forces occupy Amoy, Swatow, Canton, Hong-

This map shows the type of country the Allied armies are fighting over in their northward drive in Italy. As this issue goes to press the Fifth Army is closing in on Cassino, on the railway-line from Capua to Rome, while the Eighth Army, in the Ortona-Orsogna area, is held up by the weather.

Kong, the French leased territory of Kwangchowwan, and Hainan Island. Apart from occasional small-scale Japanese activity a few dozen miles outside Canton, this front has recently been very quiet, since its garrison is barely sufficient for defence.

The south-western front, finally, consisting of two small, disconnected sectors in Yunnan Province, has at present perhaps two or two and a half Japanese divisions, probably not of full strength, on the Salween River sector along the Burma-Yunnan Highway, up to a point some 400 miles distant from its terminus, Kunming, the small numbers of the enemy are powerfully compensated by an exceptional plentitude of modern equipment. On the southern sector the few Japanese troops are having the dubious support of several Thai or Siamese divisions. But both sectors can at any time be reinforced with relative ease from parts of the ten—or by now probably eleven—Japanese divisions in the adjoining Burma - Malaya - Thailand - French Indo - China theatre. On this front more than on any other, however, topographical and climatic conditions are definitely in favour of the defenders.

RADIUM

How Wonder Element has developed

From *Salt*, Australian Army Education Journal

AT JOACHMYSTHAL, in Czechoslovakia, Bohemians for centuries mined silver. They dug out large quantities of the metal, so large that the dollar (thaller) was named after the mine. So large, too, that in time huge dumps of the black ore, pitchblende, which contained the silver, surrounded the mines. The Bohemians were blissfully ignorant that, in this pitchblende, they were throwing away the world's most precious metal—the magical radium.

In the gay "nineties," pitchblende's habit of glowing brightly in darkness came to be regarded as a pleasant drawing-room divertisement—until a piece got mixed up with a photographic plate in a dark pigeonhole in the laboratory of a French scientist, Henri Becquerel. This piece printed its image on the photographic plate. Tests showed that pitchblende's radiance was not due to fluorescence (the storing of applied light), but came from some internal substance. M. Becquerel assigned a young Polish refugee, Marie Curie, and her French husband, Pierre, to the job of tracking down the source of this light.

The Curies decided that the radiation from pitchblende and X-rays were similar. For four years they delved among the several tons of residue from the Joachmysthal dumps, which they had been given by the mine-owners, until they collected a pinch of salt which was a compound of saline and almost pure radium.

The pinch of salt led to the greatest somersault science has had to make in modern times. There was an old and well-authenticated belief that all basic elements—gold, oxygen, &c.—were indestructible. It was now revealed that radium, emanating heat, light, and energy at uncountable speed, physically disintegrates like an irresponsible comet, but that such is its power that it loses only half its energy in 1,690 years and continues at this rate to eternity.

There were other amazing properties. A particle of this lustrous white metal, about half the weight of an equivalent volume of silver, gives off one million times as much energy as an equal weight of burning coal. One ton of radium would boil 1,000 tons of water for a year. It electrifies air. A grain of radium held over the spine of a mouse would paralyse it and kill it in fifteen hours.

Scientists were jolted into feverish activity at the sight of an atom smashing itself. They hastened to find uses for this new-found power, called for larger supplies.

The Joachmysthal earth was meticulously refined. The result was disappointing. The yield was only a few grains a year. Then in 1912, in Colorado and Utah (U.S.A.), greater quantities were found in carnotite deposits. About 75,000 tons of this ore produced an ounce. The market price was about £25,000 a gram—one twenty-eighth of an ounce. There was a heavy demand. Mineral with a small radium content was found in Portugal and Madagascar.

Deposits of uranium containing radium were discovered in 1906 near Olary on the railway-line between Broken Hill and Adelaide, and in 1911 at Mount Plainter in the Northern Flinders Range, but the last war terminated the venture. It has since been regarded as too costly a proposition to be a commercial success.

Pitchblende from a copper-mine in tropical Belgian Congo was refined in 1922 in Belgium and, at approximately £15,000 a gram, monopolized the world market.

Then, from a rocky outcrop on the shores of Great Bear Lake in the Arctic wastes of north-west Canada in 1930, Gilbert LaBine, prospecting for silver, hacked out "a tiny dark piece of ore

This Official War Photograph shows members of the New Zealand Forestry Corps in England using a tractor and logging arch to drag heavy timber away after felling.

the size of a large plum." He found that it contained pitchblende. He had tapped the most lucrative vein of radium-bearing ore yet discovered.

Now, 600 ft. beneath the snows, in steam-heated shafts, radium-uranium-silver ore is blasted out at the rate of 100 tons a day. Every 6½ tons of the ore yields a gram of radium.

It is estimated that man now possesses between 600 and 700 grams of radium—less than a pound and a half. Much has been used in luminous paint for clock and dial sights and other precision instruments, a use greatly expanded since the war.

The industrial uses of radium are almost limitless. Light rays fly off at such a short wave-length from the mineral that they can pierce battleship armour or a heavy mass of lead. So it is used to reveal, on radiographs, flaws in vital parts of important machinery. Experiments have shown that it can work miracles in the processing of silk and glass, the canning of foods, the stimulation of plant-growth.

Its medical value, also, is incalculable. It is used in the treatment of birth-marks, eczema, ringworm, psoriasis, acne, warts, neuralgia, goitre. It will force menstruation to function normally and influence the work of the pituitary gland. Australian Army medical officers are using radium and its derivative gas, radon, increasingly in the treatment of tropical ulcers.

But radium's greatest aid to mankind has been in the treatment of cancer. With it many cases of early cancer can be cured, and it is an absolute cure for certain types of the disease such as cancer of the skin.

Of all our diseases, cancer is the most fatal. Commonwealth statistics show that one in every eight deaths is caused by this dread malady. To some extent this results from the fact that medical science has partly overcome many other diseases (tuberculosis, for example) and cancer usually occurs in older people.

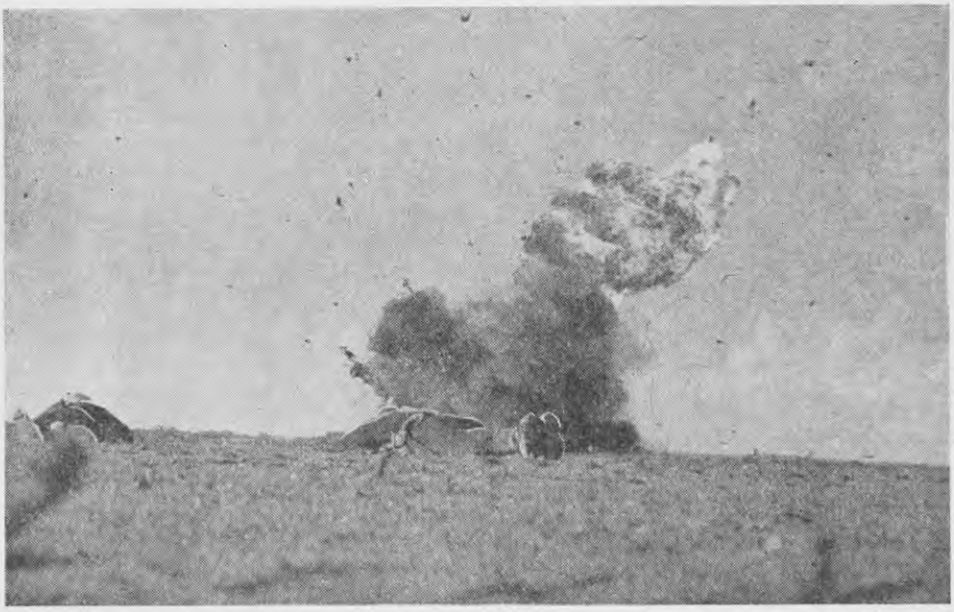
Cancerous growths are made up of malignant cells which increase enormously, spreading to various parts of the body until they cause death. Radium rays demolish these cells but do not so readily affect the ordinary body cells. In most cases needles containing radium or radon are inserted in the tissue containing the growth and left until the rays have done their work. The growth shrivels up and eventually disappears, leaving not even a scar on the affected tissue.

Since 1928 the Commonwealth Government has owned 10 grams of radium—£100,000 worth. Radium and radon taken from it are issued to hospitals in needles from "banks" at the five principal capital cities. The handling of this microscopic fortune is a ticklish job. Even to transfer a tiny particle from one tube to another requires great skill. Unless great care is taken with radium used in treatment it may be mislaid or lost, and recovering it is a difficult matter.

To prevent loss a sensitive detector has been devised; it will point out the presence of a particle at a distance of 10 ft. Once a two-milligram speck was reclaimed from a rubbish tip by this method a week after it was lost.

Laboratory workers are guarded by heavy lead shields when handling it. Continuous exposure to radium rays is injurious to health. Laboratories are ventilated so that the air is changed every six minutes, lest scientists inhale radon-charged air. In certain operations the air is changed every two minutes. The research men undergo regular blood-tests to check up on their reactions to the rays.

Yes, handling radium is a risky business. This Jekyll-and-Hyde substance kills as mysteriously as it heals. But such risks will be immeasurably rewarded. Science points out that only a fraction of radium's miracles has yet been seen.



Official War Photo

New Zealand infantry "gone to ground" to avoid flying debris as the fuel tanks of a crashed and burning Italian plane burst.

E. V. PAUL, Government Printer, Wellington.