

"SEA, LAND and AIR"

THE AUSTRALIAN NATIONAL MONTHLY

— OF —

TOPICAL INTEREST

Edited by S. E. TATHAM.

CONTENTS

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	PAGE.		PAGE.
Topics of the Month:		Book Reviews	199
Buy Australian Goods	163	Shipping Intelligence	200
Why the Country Lags	164	Aviation in Australia	205
Northern Territory of Australia	165	World's Record for Sustained Flight	209
Wasted Hours	170	The Motor World	210
A Native Funeral	171	Women to the Fore	220
Told in Tabloid	175	Junior Mechanics' Section	221
The Australian as Engineer	176	Experimental Wireless Stations in	
Humour of the World	180	Australia	227
The Loneliest Briton	181	Wireless Notes	228
Personal	186	Hints for Wireless Novices	232
Aerial Derby	187	Movements of Wireless Officers	232
Aeroplanes of Yesterday	190	An Eskimo Expert in Wireless Tele-	
Life on a Sailing Ship Sixty Years		graphy	234
Ago	191	Wireless Institute of Australia:	
Australian Navy's New Commander	194	New South Wales Division	236
Sawing a Person in Half	195	South Australian Division	238
Tapping a Rubber Tree	197	Book Review	240

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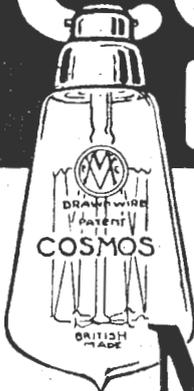
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SEA LAND AND AIR

AUSTRALIA'S
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TOPICS OF THE MONTH

BUY AUSTRALIAN GOODS

DURING the war the Australian public was appealed to in the press, and from the platform, to encourage the growth of local industries by purchasing, wherever possible, Australian-made goods. Confidently anticipating that the patriotic fervour of the people, who at the time applauded such sentiments by word and deed, would continue long after the war had ceased to be spoken of, many enterprising manufacturers invested their capital in establishing local industries. The response from the buying public was at first encouraging, and those who had staked their all in the interests of Australia's future well-being looked like reaping their due reward. It was confidently anticipated that the advent of peace would result in a steady stream of new settlers to our shores, all helping to swell the number of consumers of locally manufactured goods.

Unfortunately, there is "a slip 'twixt cup and lip," and the anticipation that in the near future Australia will become a great manufacturing country, supplying not only her own needs, but competing with other countries for overseas trade, may be counted as visionary unless a marked change comes over the scene.

The reopening of trading relations with Germany becomes operative on August 1, and unquestionably means the flooding of our markets with foreign goods priced lower than locally made articles. The problem of the high cost of living has long been a thorny one in Australia, and a reduc-

tion will be welcomed on all sides, but if that means the sacrifice of a number of our industries, the closing up of many factories and the dismissal of numbers of workmen the ultimate benefits might well be questioned.

Unfortunately, there seems to be a weakening of late in preaching the gospel of "Buy Australian Goods." During the war, when, broadly speaking, the people had no option but to purchase local products, we were continually reminded of our duty to those enterprising businessmen who were seeking to lay the foundation of this country's future greatness, but now when the necessity to do so is more vital than ever, those who could, and should, point the way of duty are strangely silent.

It is unquestionable that price always exerts a strong influence on the sale of goods, and where the quality bears favourable comparison it is useless, and in most cases illogical to expect purchasers to choose the dearer article. But the price paid over the counter does not always represent the last word in estimating the value of a deal from a national point of view, and Australia may yet learn that in sacrificing her own budding industries on the altar of cheap oversea competition she has bartered away her future industrial greatness.

The fostering of a strong Australian sentiment, a deep love of this rich and fertile land of ours appears to be one of the means by which people can be induced

to back up the efforts of enterprising manufacturers to make Australia independent of oversea competitors. A monetary sacrifice may be entailed in doing so, but it is a sacrifice well worth while. The difficulty of course arises at times that people have to regulate their purchases by the depth of their purse, and the time-honoured saying that "necessity knows no law," will obviously operate in such cases. With so many workers earning only a living wage it is difficult to prescribe a remedy for such a condition of affairs, but it is well to remember that the price at which an article can be produced is not governed solely by the amount of wages paid to workmen. The volume of output is one of the prime factors controlling prices, for it is obvious that production on a small scale must necessarily be more expensive than if three or four times the quantity is

turned out. A small percentage of profit on a big turnover is what every manufacturer and business man desires, and the sooner the Australian public realise that by buying locally made goods they are hastening the day when our own factories will be able to meet oversea competitors on a level footing the better it will be for this country.

Australia has many grave problems confronting her, and the co-operation of all interested in her future welfare is vitally necessary if the best results are to be achieved. It is unthinkable that through any lack of patriotism on our part the opportunity of reaping the full benefits of the sacrifices already made should be lost beyond recall. Now is the time to demonstrate, by practical effort, our faith in the future of this land of infinite possibilities.

WHY THE COUNTRY LAGS

THE visit of the Governor-General and the Prime Minister to the North Coast of New South Wales has drawn public attention to the lack of progress which characterises those fertile districts. Mr. Hughes' enforced stay at South Grafton has afforded him a full opportunity of assimilating the point of view of the New State enthusiasts, and this, coupled with his own admission that in the past twenty-five years the Clarence River district has made no appreciable progress, should drive home the lesson that some stimulus is needed to help the country along.

Various theories have been advanced as to the cause of the stagnation prevailing throughout the country districts of practically the whole Commonwealth. Most critics are agreed that the blame cannot be laid at the door of unfertile lands. The North Coast of New South Wales will grow practically anything, and grow it well, and it needs but the touch of experienced hands to make the soil disgorge the wealth, in the shape of primary products, for which there is an ever-growing demand. Why, then, is it that retrogression and not progress is the record which even the oldest residents frankly admit can be laid at its door? One newspaper representative, after feasting on the natural beauties which form the setting of the picturesque town of Grafton, admitted that if the country life is dull the people themselves are largely to blame.

There is a great deal of truth in this observation. It is beyond question that Nature has provided ample means for the enjoyment of life in practically all parts of the country, but the trouble appears to be that progressive spirits are lacking to make use of them. The capital cities in each State are looked upon as the great octopuses drawing the life-blood out of the rural districts, and while this may be true to a certain extent it cannot be overcome by merely deploring the existence of the evil. Much good might be accomplished if the country imitated the methods adopted in the city to attract population and make life easier and pleasanter. Time was when country life was the very essence of enjoyment, but of late years the social qualities which distinguished the residents of a few years back appear to have vanished, and an annual holiday to the metropolis is now the only thing to look forward to. Why this is so is difficult to explain. The people are more highly educated; labour on farms has been lightened by the introduction of machinery; roads and transport facilities are better, and comfortable dwellings have replaced the slab huts which were the scene of much merry-making in bygone years. And yet the district refuses to progress! Perhaps the creation of new States will provide the long-looked-for remedy. Who knows!

NORTHERN TERRITORY OF AUSTRALIA

A MUCH MISUNDERSTOOD COUNTRY

IS IT FIT FOR WHITE SETTLEMENT?

By DAVID LINDSAY, Explorer and Surveyor

(Specially written for "Sea, Land and Air.")

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THE Northern Territory of Australia is 900 miles long, 500 miles wide, with 1,100 miles of coastline. It lies between 11° and 26° south latitude. It has an area of 335,116,800 acres, of which 70,000,000 may be described as the coastal area, with a rainfall of 30 to 60 inches. This rainfall is small compared with the coastal districts of North Queensland and similar latitudes in the northern hemisphere, hence it is drier and healthier for white people.

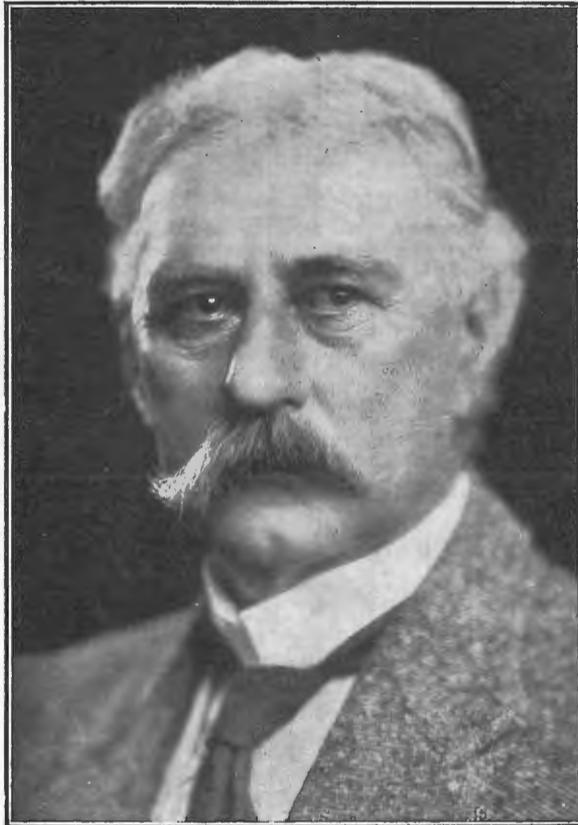
The history of the Territory might well be described as one of rapid changes but little progress.

Prior to 1863 John McDougall Stuart explored from the centre to the north coast, and submitted a glowing account of what he saw. To quote his own words:

"I passed through one of the finest countries one could wish to see. If it is settled it will be one of the finest colonies under the Crown, suitable for the growth of any and everything—what a splendid country for producing cotton!" Following on this report South Australia

applied for the annexation of the whole Territory, which was provisionally granted in 1863.

Gregory, the distinguished explorer, represented the whole of the valley of the Victoria River as being of "the most promising description, well adapted for grazing purposes, and no doubt admirably fitted by nature for the growth of all tropical produce such as cotton, sugar, rice and coffee."



Mr. David Lindsay.

South Australia, with its small population and limited financial resources, found it impossible to build a railway through the country to Darwin — 1,896 miles from Adelaide — and to settle and develop the country without this railway was not feasible. Hence it was decided to offer it to the Commonwealth. On

January 1, 1911, the transfer was effected, the obligation on the Commonwealth being to take over the debts and to "build a railway in the Territory from Darwin to connect with the Port Augusta Railway." The

Commonwealth also bought the railway from Port Augusta to Oodnadatta, 488 miles, as it constituted a part of the main through line.

The debt on the Territory was £3,931,086, and the debt for the Port Augusta-Oodnadatta railway was £2,273,937, making a total of £6,205,023. This works out at 4½d. per acre, or, excluding the improvements of railways, telegraph lines, jetties and public buildings, 2¾d. per acre. If the Commonwealth spent another £10,000,000 on railways, etc., the cost would be only 7d. per acre. Is the land not worth more than that? The answer must be "yes"!

A brief description of the country from personal professional observations will prove of interest.

It must be expected that in a country of such vast magnitude there are large areas of unoccupiable land.

My classification is as follows: First-class pastoral, 171,000 square miles; second-class pastoral, 137,000 square miles; Tropical, pastoral and agricultural, 115,000 square miles; sandy spinifex, 100,000 square miles; total, 523,000 square miles, constituting an area larger than Great Britain, Ireland, France and Germany combined.

On the southern boundary the rainfall is 5.41 inches. Here the stony plains give place to scrublands with grass, saltbushes and large gum trees on sandy plains and low sand ridges. From thence a fair pastoral land with water in springs and shallow wells continues to the MacDonnell Ranges, where the rainfall has increased to 10.71 inches, with an average temperature the same as Brisbane.

In the south-east corner of the Territory there is a large area of high sandhills clothed with mulga and spinifex, with grass and edible bushes, including saltbush, growing in the valleys. As it is within the artesian water basin, it is capable of carrying a fair number of cattle. At present it is unoccupied.

The Anacoora bore near the boundary yields 700,000 gallons of water per day, and the surrounding country supports a large herd of cattle. Through this region flows the drainage from the McDonnell Ranges, emptying, as do the large rivers from Central Queensland, into that great sink, Lake Eyre, which is below sea level. This lake is over 200 miles long, and has

a flat bottom over which the salt water spreads, moving with the wind, so that at times there may be five or six feet of water at the south end while the northern end is dry, and again the north end has the water and the south end is practically dry. Around the west and south shores there are numerous artesian springs.

The MacDonnell Ranges have an elevation of 2,000 to 4,500 feet, extending 200 miles east and west of the saddle at Alice Springs, over which the road passes, and where the north-south railway will also cross, it being the natural and only possible route. The valleys are richly grassed, and water is obtainable at shallow depths. This is good pastoral country, eminently adapted for cattle, horses and sheep, and when the railway is an accomplished fact, it will carry four times the present number and be the source of supply of meat for South Australia. Similarly the great metaliferous region in which gold, silver, lead, copper and mica are found will carry a large population. The climate is very good, the winters being cold, clear and bracing.

North of the ranges the country is mixed, large areas of fair to good pasture land alternating with belts of sand covered with mulga and spinifex. There are very few surface waters, but water is obtainable at shallow depths almost everywhere. A few small settlers with their families are located hereabouts, having various sized herds of cattle and horses. These people are healthy and contented with their lot, in spite of the cost of transport of all stores and material by camels from Oodnadatta. This cost varies from £18 to £25 per ton. Their great need is railway communication, which would give them added comfort and a competence in a few years. Much of the so-called desert is very fair pastoral country, the spinifex being edible and of considerable food value for sheep. The elevation averages about 1,600 feet, and the rainfall increases the further north one goes.

When south Newcastle Waters, 520 miles south of Darwin and 1,500 miles from Adelaide, is reached, the country changes and improves, as it has richer grasses and the rainfall is seventeen inches. The average temperature is about 75°.

The western edge of the rich Barkly tablelands is next encountered, and for 460 miles the unbroken rolling downs and plains, clothed with Mitchell and Flinders

grass and bluebush and indigenous rice stretch away east and south.

This great stock country, which would support 10,000,000 sheep if railway transport facilities existed, is being developed by sub-artesian bores. Water is found at 200 to 700 feet, and rises to within pumping distance of the surface, whence windmills lift it to storage tanks. The average elevation is about 1,000 feet and the climate is good, intensely cold in winter, due to the south-east winds.

Although an artesian area exists in the south-west portion extending to the telegraph line, no bores have yet been put

of Daly Waters is reached. Somewhere in this vicinity the "sometime to be built" Queensland railway will diverge to the south-east to join the proposed trunk line through Queensland to Sydney.

It is a little known fact that the average elevation of the Northern Territory is higher than that of New South Wales.

All this country is languishing for the railway which the Commonwealth contracted to build, but has not yet commenced. When it is completed we may expect much pastoral settlement and mineral development, for it will enable those little-known metalliferous areas, including the



Darwin Pier.

down in this locality. Away to the west of Newcastle Waters lies the great pastoral region of the Victoria River Valley, which is capable of carrying as many stock as are now found over the whole of the Territory. It is also within the region where oil has recently been found. Should flowing wells be found the question of railway construction will not long be deferred, and an extraordinary impetus will be given to settlement.

From the head of Newcastle Waters the coastal region may be said to commence. An east-west belt of poor country exists along the watershed until the level plateau

rich wolfram fields of the Davenport Ranges in the centre, and the Kimberly Tanami Tennants Creek auriferous areas to be exploited.

The present cost of carriage to Newcastle Waters by camel from Oodnadatta is £31 per ton, an exceptionally heavy burden on settlers.

The conformation of the coastal region lends itself to easy subjugation owing to its many fine rivers, navigable from 30 to 90 miles, flowing through vast open plains of rich soil. There are no high ranges parallel with the coast as in Queensland, and no huge scrubs to obstruct progress. From

these rivers irrigation could be easily and cheaply effected and good ports made available at small cost.

Rainfall.

Intermittent rain falls in September, October and November, and heavy rain sets in with the north-west monsoon about Christmas, continuing into March. The south-east monsoon sets in in May, lasting to September, during which period no rain falls. The average yearly rainfall on the coast at Darwin is about 85 inches.

Agriculture.

In the coastal area there are about

growing world's market for it, its systematic growth should make the Territory a most important and wealthy State.

Another white man's product is upland rice, which can be planted and reaped by machinery. A twelve-acre plot has been known to yield 730 bushels of grain, and Mr. Holtze, lately in charge of the Botanical Gardens and Agricultural Department, said: "Rice should be to the Territory what wheat is to South Australia."

The soil in the rice fields at Benluck is inferior to but very like the soil on the Adelaide River plains, yet Saigon is able to



Daly River, 60 miles from mouth.

50,000,000 acres of fertile land, capable of growing cotton, rice, coffee, maize, many fibre plants, all vegetables and sub-tropical and tropical fruits. The average rainfall is from 45 to 60 inches.

Its equable temperature and regular wet and dry seasons make it ideal for cotton, and it can be said confidently that it will grow more cotton than the rest of Australia. This product, which has been proved to be from first to last a white man's industry in Queensland, grows luxuriantly almost anywhere. The profits in that State range from £12 to £15 per acre. Cotton is grown and picked during a period of seven months, and as there is an unlimited and

export half a million tons of rice per annum while the Northern Territory, with a better soil and better climate has to import even the small quantity of rice consumed there. The soil and climate of the Territory are also suitable for growing sugar, coffee, tobacco, cocoanuts, India-rubber, jute, arrowroot, tapioca, sesame seed, peanuts, maize and the usual food and fodder plants and fruits of the Tropics. Of the fibre plants ramie, jute, sun hemp, kapok, Manila hemp, bowstring hemp, pita fibre and sisal hemp are all thoroughly successful. Ramie shoots four months old have been known to attain a height of eight feet, and sun hemp sown

two and a half months has grown seven feet high without showing any flowers. In addition sorghum and all the millets grow profusely.

The pastoral and mining industries are the principal factors of settlement at present, but agriculture can be made the most important, as so many readily marketable products can be grown in average soil. If community settlements were established, and the marketing of their products placed in the hands of an association, success would follow.

Pig raising alone would be very profit-

about in the sun hatless and bootless. Can this be done in any other country of the same latitude? Hardly so! And this fact rather upsets the deductions drawn by some scientists, who form their opinions from theory and latitude, but who have had no practical experience in the north.

That white men can live to an old age, and that their wives and children, with ordinary conveniences and comforts, also thrive and have good health is amply demonstrated by those who have lived in North Queensland and in the Territory since the late sixties and early seventies, both inland and on the coast.



A settler's home on the Daly River.

able. Given selection of the right localities, settlements could be formed on which at a much less cost than in the south agriculturists would surely make good. The equable climate does not call for expensive houses or clothing.

If this country were opened up in a practical, scientific way, it would carry a very large white population. Granted it is hot and tropical, yet we find white men, both young and old, working out in the sun with no body covering and frequently without head covering. The ordinary felt hat is usually worn, and the white children run

White Settlement.

The great problem awaiting early solution for North Australia—the empty North—is, can it be settled by white races, or must it be left empty? “White Australia” being the settled policy of Australia, it has to be either white or empty, for we cannot permit it to be coloured.

The writer thinks it can be kept white. The climate is not an insuperable obstacle according to the medical commission, and the practical proof lies in the white races who have been sixty years in North Queensland and the Territory—who have married and lived there to see their grandchildren



A sugar-cane and banana farm.

married and in homes of their own, with their stamina showing no signs of deterioration. Given the comforts and conveniences of civilised life and easy communication with the rest of the world, there is little doubt that many thousands will make their homes in the north. The returned soldier should be given an opportunity to settle there where the purchase of land would be no incubus, and the wants of life few and simple.

If the "North Australian White Settlement Association," now being formed, can solve the problem of peopling the North, it will accomplish work of great national value.

The present population of the Territory is: Europeans, 2,770; other races, 1,161; aborigines, approximately, 30,000.

The value of minerals produced in 1919-20 amounted to £78,000.

The latest returns of the stock held there show the number of cattle to be 610,534; horses, 35,539; sheep, 8,811; goats, 12,582; pigs, 1,675. The heavy drop in the number of sheep has been caused by the conversion of Avons Downs station, carrying 60,000 head, to a cattle station.

The one thing needed to enable this great rich land to be settled and developed is railway connection with the southern States. This, coupled with sane and proper government, administered by those with a full knowledge of the conditions operating there, will turn what is now regarded as a wilderness into one of Australia's greatest assets.

WASTED HOURS.

There was a day I wasted long ago,
Lying upon a hillside in the sun—
An April day of wind and drifting clouds,
An idle day and all my work undone.

The little peach trees with their coral skirts
Were dancing up the hillside in the breeze;
The grey walled meadows gleamed like
bits of jade
Against the crimson bloom of maple trees.

And I could smell the warmth of trodden
grass,
The coolness of a freshly harrowed field;
And I could hear a bluebird's wistful song
Of love and beauty only half revealed.

I have forgotten many April days
But one there is that comes to haunt me
still—
A day of feathered trees and windy skies
And wasted hours on a sunlit hill.

—Medora Addison.

A NATIVE FUNERAL

HOW THE ABORIGINES BURY THEIR DEAD

VIEWS ON THE NORTHERN TERRITORY

By FRANCIS BIRTLES

An eye-witness's account of the weird ceremony indulged in by the natives of unknown Australia when burying their dead will prove interesting, if amusing, reading to the followers of Francis Birtles' articles. The famous explorer's views on the future of the Northern Territory will also be read with interest.—Ed.

AFTER a restless night, I was awakened just before dawn by a horrible din of howls, cries and shrieks arising from the blacks' camp. Having heard this "music" before, I knew that someone was dead. After breakfast I strolled down. A gin had died during the night. The body was already wrapped in paper bark, and the natives were on their haunches holding the "wake." Some were covered in white copai clay splashes, and gins and lubras were frantically digging sharpened yam-sticks into their heads. The red blood trickling over the pure white paint on their faces was very gruesome. One of the howling natives was dancing about, trying to cut off his own head with a tomahawk blade, while several others were holding his arms to prevent him from doing any further damage.

To the accompaniment of tears, blood and wails, mingled with dog barks and yelps, the remains were carried away on the heads of two natives, a motley procession following behind. In a gloomy ti-tree swamp, the body was placed on a five-foot high bough platform, amid great and noisy lamentations, which set the corella cockatoos screeching, and scared the scrub wallabies hastily away from their haunts. Silently the mob of niggers dispersed. A crow flitted silently up, looked suspiciously around, and then called his mates; a dingo howled and immediately came answering calls from the far distance. Then, at the camp, the inland tribe gathered up their worldly belongings, and, stringing out one behind the other, disappeared into the forest.

Off to the Coast.

The party I was with proceeded straight to the coast. Amongst the mangroves were

stowed away little wooden dug-out canoes. In these the various owners paddled away on the outgoing high tide, and were soon lost to view in the forest of mangroves growing in the sea. They were going out dugong spearing. With two natives I walked along to a spot where there was an open sandy beach, and hunted for turtle eggs. The twenty-four hour tide was now fast receding. We came across a three-foot wide track extending from high-water mark to the foot of a sand hillock, and thence back again in a V-shape formation. A few scattered shells lying about showed where a hungry iguana had found the eggs, having dug up a few from the top of the post-hole-like nest. In this we dug down with our hands for a few feet and found the eggs, one hundred and thirty-nine in number, of the shape, size and texture of a tennis ball. The niggers promptly made a hole in the ground, gathered up pieces of wood, and proceeded to hunt through each other's curly hair for matches, which I had given them. The fire was lighted, and when it had burned down to a hot white ash about fifty eggs were put in, covered over, and left to cook.

In the meantime we amused ourselves with small grass-twine nets at the mouth of a small tidal channel. A few fat mullet were ensnared; and, then, whizz! my net was dragged out of my hands. In the muddy waters I cautiously approached the swirling mass of foam. Out of the hurly-burly a three-foot, double-edged, saw-like snout arose. It was a six-foot sawfish. Instantly spears were driven into its leathery hide, and the whole caboose dragged ashore. The net was a tangled mass of weeds, sticks and cord interwoven with the serrated snout.

Grilled Turtle Eggs.

Whilst having our luncheon of grilled turtle eggs, which tasted like a combination of duck eggs and oysters, I sat and watched some thousands of soldier crabs at drill. In columns of four and six deep they advanced, and then wheeling into rough, irregular lines retreated, broke into sections, and, surrounded by skirmishing pickets, advanced once more. Then came a general scatter, and all disappeared by quickly entrenching themselves on the wet sand flats. One of my black companions had devoured twenty-seven cooked and ten raw eggs. He now slept soundly and snored loudly. The other went down to the water's edge armed with a flat-sided stick. Bending cautiously over, he waited. An inquisitive fish arose, and was promptly cracked on the head. In true blackfellow style I went to sleep, lying out in the hot sun, which I knew would help to take the fever ache out of my bones. Flies were a bit troublesome, and now and again a wasp-like insect would come darting about, and walking around in a bombastic manner, truculent and authoritative. All the other flies would then disappear. He is known as the "policeman fly," science having not yet given him a name.

Natural History.

After our siesta, as the tide was out, we wandered about amongst the mysterious mangrove thickets. Queer tree-cracks and sizzling hisses arose from underfoot. Down into a jagged, muddy, watery hole at the foot of a tree the natives peered and jabbered. Presently a spear was thrust down; there was a grinding, chopping noise, and after a little bit of digging, out came an enormous crab, eighteen inches across—a big, fat, shell-encrusted circular body equipped with blue, bony claws big enough to break a man's leg. We massacred him, then gave the remains to the dogs to eat. As we wanted sport, we went seeking for sea-snakes. Wading out to our waists in water, we pushed our clap-nets along in front. A small head with portion of wriggling body showed up on the surface. The meshes are promptly closed on him, and then, very gingerly, as we were minus clothing, we carried the reptile out. On the sandy beach we opened up the net, and a four-foot long bright yellow snake dropped, wriggling to the ground. He was fat and flabby, with mouth open in de-

fiance and tail flat-edged and fringed with a series of feathery-like fins. It was probably poisonous, as the blacks describe it as "coolah," or "sulky fellah." These snakes are of various bright colours, and look like the results of drinking too much outback bad whisky.

The Rifle Fish.

In the tidal channel I noted the pretty ten-inch long rifle fish. This chap is brown on the back, with broad stripes of black and silver underneath. These fish are remarkable for their spitting talents. For precision of aim a Sydney youth would be easily outdone. Hovering two feet above the surface of the water is a fly. Up to the top comes the alert fish, takes aim with its mouth, a little ball of water strikes the insect, and with wet wings it falls down and is swallowed in a twinkling.

"Alligator" Eggs.

Some miles away smoke signals appeared. These we answered. Over in that direction is a native well, and, as we were getting thirsty, we made tracks for this. The aborigines gathered up the remainder of the turtle eggs, placing them in big sea shells, which will be used later to carry fresh water, and also as drinking cups. Amongst the rushes above high-water mark we found an alligator's nest, which the two natives would not touch. They are young men, and they believe that if they interfere with the alligator's property they will at once become old men. Scraping away the decaying vegetation, I found first a horrible odour, and then, scattered amongst the filth, thirty-two eggs, some of which were just about to hatch. Breaking open the hard shell, I dragged out some nine-inch long young alligators, which hissed furiously and snapped their needle-like teeth at my fingers. At the camp we found the dugong hunting party. They had met with no results, and for tucker they had brought back slices of a big green-back turtle; about two hundredweight of steaky looking meat, of which I took a goodly portion and roasted on the coals. In the meantime the "well," a soakage in a hollow of a sand gully, and which had been filled in with grass and earth by the last visitors (this to keep game from polluting), had to be dug and cleaned out. The water was vile to taste and brackish, and with the thirst I had developed during a hot, strenu-

ous day, I longed for a nice cool George Street café refresher. Supper of turtle and mullet ended the day. Several times during the night I tried to appease my nagging, dream-haunted thirst. "Wowser" was uneasy, growling and snoring in turns.

Next morning I noticed that close to this camp were the remains of a tropical village, the greater portion of which had been burnt down. A few huts with paper-bark roofs and walls of interlaced cane grass were still standing amidst the tropical growth. These had evidently been erected by Malays, and probably used as a base for some of their illicit beche-de-mer fishing.

High up in the blue sky a number of white cranes were fighting an aerial battle. The roaring of their wings as they circled up against the wind could be heard miles away. The whole surging mob disappeared over the tops of the trees. Judging by the number of water-fowl and other birds coming to and from this direction, I decided that there must be some good water-holes close by, but the natives, true to their traditional habits, would not let the white stranger know the whereabouts of good waters—or, maybe, that part of the country is infested with "devil-devils"!

Wild Pig Tracks.

Strolling around, I noticed fresh pig rootings and tracks. "Wowser," smelling the battle from afar, was on the alert, and stood, head up, sniffing, with back hair on end and tail defiantly erect. The niggers would not accompany me on a hunt, as these Gulf natives will not eat pig, owing to some traditional instinct which still remains with them. A great number of these aborigines show Jewish traces, both in physique and customs. The pigs in this locality are breeding in great numbers, having been left behind from abandoned settlements further south. Some, perhaps, are strays brought from overseas before the days of the vigilant customs officials. Pig-breeding up here should be an Australian tropical asset, especially so in connection with cocoanut and peanut growing.

The Future of the Territory.

This Gulf country of North Queensland and the Northern Territory is well adapted to stock raising. The best results have not been obtained so far, owing to the conservatism of tropical stock raisers. The tick

and various unnamed and unstudied tropical diseases seriously affect this pioneer industry. The descendants of stock from cold and temperate regions do not fare to the best advantage here, but this strain, bred in with tropical breeds of cattle, such as the zebu and brahims of India, or some of the types of Asiatic buffalo, would undoubtedly lessen the mortality from disease. The rank grasses and herbage would fatten, where, with ordinary breeds, it would only just about maintain life. These grasses also change their nature for the better when eaten down for a few seasons and become more suited to southern types of stock. On the Adelaide River Plains of the Northern Territory and surrounding country, buffalo, zebri and brahim cattle and Timor ponies are roaming in thousands, absolutely wild, and in splendid health and condition. These are the descendants of Port Essington stock. The buffalo and wild cattle beef makes excellent eating.

Australia's Front Door.

This is Australia's front door, and there is an ever increasing Asiatic market for all the produce, vegetables and animals, that the North can produce. There are millions and millions of prospective consumers, who are learning the values of a meat diet. If our Northern cattlemen raised even the very small Indian breeds, there would be an enormous trade with the Straits Settlements, India and the Asiatic markets. These beasts are hardy, breed fast, and can be raised to store stock, sent overseas, fattened and killed by the village priest or the coolie butcher, who prefers the live beast, which will be "slaughtered" according to religious custom. The small carcass, too, will just fulfil the daily requirements of the small community. Some of the overseas quarantine laws put a check on this promising industry, but conditions are now becoming more satisfactory. Meat works, tinned goods and chilling depôts are not required for the Asiatic market. Live and healthy stock is required to suit the religious food customs of the people. I lay emphasis on this fact, as it seems to be overlooked, although it is a matter of great importance to Northern pastoralists. Given a sound selling organisation in these markets, the future of pastoral Northern Australia is assured, and will eventually open up to settlement all the present useless

low-lying tropical lands. These lands are also well favoured for tropical vegetable products, and the dairying industry may even be established after some years of settlement. I have seen and tasted excellent butter made in the extreme north of tropical Australia. This system of breeding stock would most certainly give the white man a sound financial footing in our empty north. A Government experimental farm of hybrid stock would not be an expensive venture. Our northern lands must be peopled—it is Australia's danger zone. A person must mingle with the Asiatic races to hear their opinion of these fertile regions—and their wishes. Also foreign investors have got a grip, more especially within the Territory, where even unexplored and unknown tracts of country are held in lease. This is one of the reasons why explorers do not ransack the "desert lands" for pastoral "finds."

Hunting the Wild Pig.

Leaving the blacks behind in their camps, I proceeded up the river armed with my "44." Pig tracks were numerous, and, judging by the way the earth was uprooted, the animals were present in great numbers. "Wowser," snorting and tugging at his chain like a bloodhound, led me along to a dense mangrove thicket on the edge of the river, which at high tide would be surrounded by water. On this little island I let the dog loose. The hot, tropical sun created a deadly, steamy, atmosphere. A dense silence hung over the place, disturbed only by the rippling splashes of shoals of mullet feeding on the edges of the mud banks. Suddenly there was a scuffle among the thick scrub, followed by furious snorts, grunts and squeals. The next moment a little pig rushed madly past me. Down in the bushes I found "Wowser" standing with his two front feet on a porker. With ears mischievously alert, he was vigorously poking the animal with his nose to make it yell. Picking "Little Dennis" up I put him inside my shirt. As I did so, "Wowser" rushed savagely back into the gloomy thicket. There was the chopping sound of gnashing teeth, and then, grunting savagely, an old boar trotted out. Sighting me, he halted, his devilish-wicked eyes and chopping, foaming jaws armed with six-inch tusks, backed up with three hundredweight of toughened virile energy, being but three yards away. He was going to charge.

"Wowser" to the Rescue.

My rifle was lying on the ground out of reach, but before I knew what had happened, "Wowser," following the brute's tracks, had dashed out of the scrub, and planted himself right in front of my enemy. The old boar ducked his head, charged, and with his tusks gave a vicious uppercut at the bull dog—"Wowser," a keen, scientific dodger, was not there. In a flash he had the animal by the ear with a vise-like grip. Into the scrub the boar went, trying to use the mangroves to tear the dog off. Grabbing the rifle, I followed in haste, knowing that in the hot, gloomy shades the dog would soon knock up and be badly mauled. Grunts, growls and crashes of scrub, told me of the struggle still in progress. "Wowser" still kept his grip, but suddenly the boar came backwards along his tracks. Jammed up against the impenetrable vegetation, I could not get out of the way, and the boar backed between my legs, his tusks but a few inches from my shins. "Wowser," bloodstained, still hung gamely on, but there seemed to be a mute look of appeal to me in his eyes. The porker inside my shirt commenced to add his music to the grand chorus.

A Sad Predicament.

At that moment I discovered that the magazine of my rifle was empty. Hastily putting my hand into my trousers pocket I searched for a cartridge. They were all gone, having doubtless fallen out in the *melée*. I jabbed the muzzle of the rifle violently at the back of the brute's ear, but with no results. Then the bushes broke away, and I fell over backwards. The boar was off again, "Wowser" disappearing after him. Once more the hub-hub arose, and this time, judging by the splashing, the boar had sought refuge in the river. I made a hasty search of the locality, and discovered some of the missing cartridges. Quickly filling the rifle magazine, I pushed a way through the tidal fungus, and saw the pig standing in the shallow water with the bull dog keeping guard on the bank. On his hindquarters blood was trickling down, showing that he had been ripped. On the hot, greasy-looking waters inquisitive bubbles were floating around, indicating the presence of interested alligators. The porker was making a squealing noise inside my shirt, so, removing this garment, I tied him up in it. The pig had, in the meantime,

started to swim the river, "Wowser" energetically paddling along behind. Now and then he came up closer and made several futile attempts to grab the animal's ear, eventually getting a grip. Down sank the pig, dragging the bull dog out of sight. Coming up again, they circled round and round. Taking careful aim, I put a bullet into the wild animal, and then, fearing for the safety of my battling companion, swam out. Just as I got near both pig and dog disappeared from view. Then I remembered the alligators. To my relief "Wowser's" stern rose to the surface, so I grabbed him by the hind leg and started to tow him out, while he still retained his hold on the boar's ear.

A Painful Injury.

Once stranded on the mud banks the old boar was still game. He gave the bull dog another rip on the throat, and then, slewing around, made a vicious lunge at the back of my legs. A sharp pain ran through my body, giving me the cold shivers. Hastily scrambling out I looked at my right foot. I had trodden on a cat fish. The three inch poison barb had gone through the sole of my elastic-side boot, penetrating right through my foot, and, having broken off the fish, was now protruding half an inch above the leather upper. The boot would not come off, as the spike had pinned it to the flesh. The pain brought on a cold sweat. Taking the string "pull through" cleaner from my rifle, I wrapped a few turns around the top portion of the barb and pulled and pulled. Everything went dark, and then bright dots and lightning flashes ap-

peared before my eyes, and a buzzing developed in my ears. Grinding my teeth, I kept on pulling until out it came. Feeling sick, I sat still and cold in the blazing sun. The pig, in the meantime, had departed this life. "Wowser" panting, and with a triumphant gleam in his eyes, kept watchful guard over his ration of pork. Calling him away for fear of alligators catching him, I lay down in the shade of a tree. The pain in my foot was vicious, and the cold shivers were so continual that I started to vomit. An ugly looking blue patch had spread around the wound, from which no blood had come. I boiled some water in a clam shell, and, keeping this hot with a small fire, I placed the foot in it, keeping it there for over an hour. "Wowser," seated alongside me, got his share, too, of medical aid. I bathed all his wounds, cleaning out the mud and blood. When the temperature of this salt water got very near boiling point I took my foot out—the pain had nearly gone, leaving only a dull throb.

The carcase of the old boar had disappeared. Up to, and away from where I had left the animal, a two foot wide track, scarred on the outer edges with hand-like claw markings, showed where a greedy alligator had come up and stolen our hard-earned supply of meat. This alligator must have carried the heavy weight in his jaws, lifting it clean off the ground, as no tracks of the carcase could I see. These saurians (called estuary crocodiles) have immense strength. They attain a length of twenty feet, three feet in diameter, and must weigh about two tons when full grown.

TOLD IN TABLOID.

The thing labour unions throughout the world seem to be unable to see is how hire ever can be lower.—*Manila Bulletin*.

The world has too many cranks and not enough self-starters.—*Columbia (S.C.) Record*.

Noah sent out a dove and it found a dry spot, but we fear the bird would have a harder time now in the U.S.A.—*Manila Bulletin*.

Another thing that delays the return to normal is the theory that business is equipped with a self-starter.—*Boston Post*.

Elijah being fed by the ravens had noth-

ing on Russia being fed by the American eagle.—*Nashville Southern Lumberman*.

There's always something to make coal cost more.—*New York Sun*.

When a diplomat "lays his cards on the table," he usually has another deck up his sleeve.—*Columbia (S.C.) Record*.

Sometimes a movie hero is one who sits through it.—*Newspaper Enterprise Association*.

The line of least resistance in Russia will be Hoover's breadline.—*Greenville (S.C.) Piedmont*.

Lenin and Trotzky are a combination in restraint of trade.—*Pittsburgh Dispatch*.

THE AUSTRALIAN AS ENGINEER

SPLENDID WORK AT EVELEIGH WORKSHOPS

By HAMILTON HYDE

THE great engineering works of the New South Wales State Railways, at Eveleigh, near Sydney, are in the forefront of the enterprises which are helping to make Australia self-reliant and self-supporting. They are equipped to deal with every form of locomotive repair and construction, and the work they turn out is proof of the skill of the Australian artisan and the excellence of his crafts-

their importation was resumed, but in other cases manufacture was continued, and Eveleigh grew more self-contained than ever.

At present there are three thousand three hundred employees—highly skilled engineers, artisans and labourers—in the Eveleigh workshops, engaged in repairs, in the manufacture of locomotives and in concomitant industries. The majority of



The Eveleigh Railway Workshops, in which Australian engineers are turning out work equal to any in the world.

manship. The great locomotives of the NN class, which have broken all Australian records both for haulage and speed are, however, the chief pride of the establishment. It has been found that manufacturing costs at Eveleigh are invariably below the rates at which the engines and parts could be imported. During the war naturally there was a great increase in the variety of the jobs handled, for with the workshops of other countries closed to them the engineers found it necessary to rely upon their own resources. When Peace came it was found that the quantity needed of certain parts was not commensurate with the cost of manufacture, and

the men served their apprenticeship in the same works, and most of them are Australian born. The magnitude of their task may be gauged by the fact that it is their business to keep in repair the one thousand three hundred and ten locomotives in service on the New South Wales railways (of which there are five thousand and fifteen miles), besides undertaking the manufacture of such new engines as may be needed.

The maximum output of repaired engines has reached five hundred and eighty-one in one year, while twenty new locomotives have been constructed within the twelve months. The largest passenger engine

manufactured at Eveleigh is the express of the NN class. Its total weight in steam with tender is one hundred and twenty-four tons fourteen hundredweight. The weight of the engine itself in coupled wheels is fifty-eight tons, and its twenty-two and a half inch cylinders, with pistons of twenty-six inch stroke, supply a tractive power of thirty thousand two hundred and twenty-eight pounds. The diameter of the driving wheels is five feet nine inches, and the boiler pressure is one hundred and eighty pounds per square inch. Thirty engines of this class, all of which have been built at the Eveleigh works, are now running in the railways of New South Wales. The heaviest goods engine made is the K class, of a total weight, in steam with tender, of one hundred and twenty-five tons nineteen hundredweight. The weight of the engine in coupled wheels is sixty-six tons, and its tractive power is thirty-four thousand pounds. The cylinders are of twenty-two inches, with a twenty-six inch piston stroke, and the diameter of the driving wheels is four feet three inches.

The works at Eveleigh include a foundry, a series of blacksmiths' shops, a boiler shop, a shop for the manufacture of springs, an erecting shop, a machine shop, and a tool-room, all housed in a great collection of buildings alongside the railway line.

The foundry is more self-contained than the majority of smaller establishments attached to railway repair shops. It comprises sections for casting in iron and steel, as well as in brass and other non-ferrous alloys. The output of castings from the iron section has reached forty-five tons a day. The maximum output of brass castings is eighty-five tons a month, and of steel fifty-one tons a month. Machine moulding has been extensively adopted; in fact it is carried on wherever possible, because of its superiority in speed over the old method of hand moulding. The molten metal is carried by machinery to the mould into which it is run with a minimum of labour. The larger castings are still done by hand, however, as it would not be profitable to install the special machinery required.

Very satisfactory results were recently achieved by the introduction of a bonus system amongst the moulders, under which

increased payment is made for output in excess of a predetermined quantity, for which a fixed wage is paid. A comparison with the old fixed-rate system discloses some remarkable figures, the output often being doubled and sometimes trebled.

The iron section of the foundry is equipped with two Thwaites cupolas, fitted with receivers each with a capacity of ten tons an hour. They are supplied with air from a pair of electrically operated Roots' blowers, the pressure being from sixteen to eighteen ounces per square inch. Only one cupola and one blower are operated at a time.

Schwartz furnaces are used for brass melting. Three of these were installed, two of two thousand pounds capacity, and one of five hundred pounds. The fuel used is crude oil, the consumption being approximately seventy gallons per ton of molten metal. The pressure on the fuel varies from twenty pounds to thirty pounds per square inch, according to atmospheric conditions.

A one-ton Stocks oil-fired converter is used for producing the steel. With this equipment conversion from iron to steel is possible in the same vessel. Crude oil is used for fuel, and during the melting period the waste gases pass through a nest of tubes encased in brickwork, the heat contained in this economiser being taken up by the air in its way to the converter. The Stock equipment is self-contained, having its own electrically operated blower and oil pump. The tipping and revolving of the converter are also effected by electric motors.

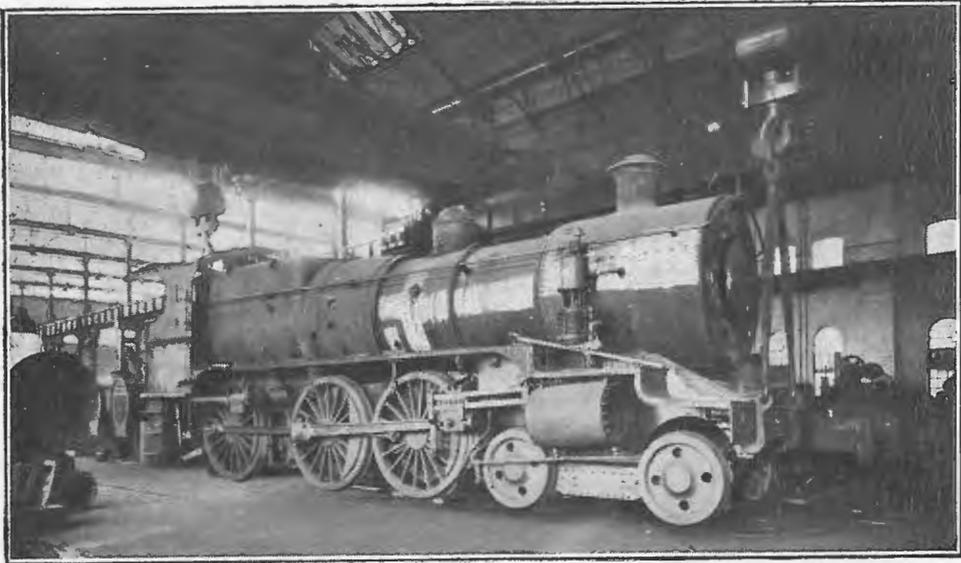
The forging shops are equipped with a large range of steam hammers, weighing from seventy hundredweight downwards, and a one thousand five hundred ton forging press of the steam hydraulic type is being installed. Axles for engines, tenders, carriages and waggons are here forged from steel bars or blooms manufactured within the State. There are also fourteen Allen steam strikers, operated by compressed air, in use for forging small articles. Coupling-irons, spanners and hinges which were previously machined are now turned out in a finished state by these steam strikers.

A three-inch Ajax forging machine is in constant operation manufacturing roof-stays, draw-bar pins and other similar

articles. It turns out an average of four and a half tons of forgings per week. A one-inch Ajax continuous heading machine manufactures rivets, fishplate bolts, dog-spikes, and similar articles. Red-hot bars of iron are fed into this ingenious contrivance, which in one movement cuts the bars into the required length, and spits out the bolts and dog-spikes at the rate of ninety-eight a minute. This machine can make forty patterns of bolts, spikes, and rivets, and so fast are they turned out that a man is kept busy shovelling them away from the point of delivery. The output of this machine is twenty-three and a

proportion of riveting is also done by compressed air hammers, and all wall stays are headed by air tools.

The oxy-acetylene flame is largely used for cutting plates which until recently were either sawn or otherwise machined. A very interesting portion of the boiler repair shop is devoted to the lengthening of copper boiler tubes. When the tubes are removed from boilers under repair a short portion of the end is destroyed. The mouth of the usable portion of the tube is then widened, and a short length fitted in and brazed. Careful organisation and specially designed equipment enable the output



Lifting a 71-ton locomotive at Eveleigh.

half tons of small forgings per week, and the work is practically automatic. A nut-forging machine manufactures one ton twelve hundredweight per week.

In the boiler shops all new boilers required for the railways are manufactured, and the work of heavy repairs is also executed here. All boilers for the New South Wales Government Railways are of the Belpaire type. The flanging for throat plates, back plates and other parts is accomplished by a six hundred-ton hydraulic press, which is also used for folding iron sheets into the required shapes. Three large hydraulic riveters arranged in pits and provided with crane towers do the bulk of the firebox and barrel riveting. A

to reach two hundred tubes per man per day.

The spring shop manufactures all springs needed for locomotives, carriages and wag-gons. Laminated, volute and spiral springs are manufactured from locally produced steel. The testing is accomplished by means of a great hydraulic press, which descends on the spring with a measured weight. If the spring stands the pressure it can be put under a railway carriage with the sure knowledge that it will bear any likely strain without danger. If not, it is crushed to such an extent as to be useless, and goes back to the melting pot to be made up again.

Three separate buildings are at present

used as erecting shops. Two of these have pits arranged longitudinally and are served by pairs of thirty-five-ton overhead cranes. Engines for repair are lifted by a crane from the track over the pits where they can be conveniently dismantled and re-assembled. The third erecting shop has pits arranged transversely, the locomotive being brought from the shops by a traverser.

The machine shop equipment comprises scores of wheel and axle lathes, planing machines, drilling machines, grinders and shapers. Some of the planing machines are fitted with direct electric drive, speed variation for cutting and returning strokes thus being easily effected. A number of semi-automatic lathes are engaged in repetition work.

In the extensive tool room, in addition to the usual standard gauges, tolerance gauges and micrometers, there is a measuring machine capable of registering up to one one-hundred-thousandth part of an inch. In this portion of the works the whole of the repairs to hard tool equipment is effected, while a large number of special dies, taps, reamers, and milling cutters are manufactured. As has already been stated, the number and variety of these tools now manufactured at Eveleigh has greatly increased since the war, when their importation from abroad was impossible or extremely difficult. These tools are now being made so cheaply that the imported article should soon be altogether unknown.

The remarkable record of engine No. 1093, one of a type used for goods trains, is quoted as evidence of the high class of work turned out at Eveleigh. This engine was built towards the end of 1915 and ran one hundred and five thousand miles with-

out being withdrawn for repairs. It came off the road for the first time at the end of April, 1920, having established a record of over three years' continuous running. What is claimed to be one of the finest jobs ever turned out at Eveleigh was the rejuvenating of an old Baldwin engine. This locomotive having been imported thirty years ago, was regarded as fit only for the scrap heap, when it was decided to give the workshops a chance to save it. The job was completed, and the old engine went out on the road equal to anything in the service.

When the Prince of Wales visited Australia Eveleigh built a complete train for the Royal tour of New South Wales. The job was an all-Australian triumph. The entire train was of local manufacture, and in excellence of workmanship and artistic craftsmanship challenged comparison with the famous Royal trains of England. The men on the work put their hearts into the job and turned out a blue and gold masterpiece worthy of the distinguished visitor.

The Eveleigh workshops supply many instances of the ingenuity of the Australian workman. An apprentice devised a high-class type of grinder and persuaded the management to have one made. It proved a complete success. It is not only superior to the imported article, but costs fifty per cent. less. A duplex screwing machine was also invented by an employee. It will screw twelve nuts on bolts in sixty seconds, as compared with a hand rate of about two a minute. A man feeds the nuts into the machine, which automatically screws them on.

The collection of machinery at Eveleigh is magnificent; the spirit of the employees is excellent, and the quality of the work which they turn out is equal to anything in the world.

Let but the will of a human being be turned to any particular object, and it is ten to one that sooner or later he achieves it.

You may sum the duty of your life in the giving of praise worthily, and being yourselves worthy of it.—*Ruskin*.

Out of the lowest depths there is a path to the loftiest height.—*Carlyle*.

As my life to-day has been determined by the way, I lived my yesterday, so my to-morrow is being determined by the way I live my to-day.

Wealth is the smallest gift on earth, the least gift that God has bestowed on mankind.

The great secret of happiness is to be at ease with yourself.

HUMOUR OF THE WORLD

Nerves of Steel.

"Well, so long," said the aviator, nonchalantly, as he prepared to drop 5000 feet earthward.

"Pardon me for mentioning it," said the pilot, "but you haven't hooked on your parachute yet."

"Thanks, old top. In another minute I would have been gone without it."

* * *

Her Little Diversion.

They were talking about woman friends.

"Do you see Emma often," one inquired.

"Oh, yes, quite frequently," the other replied.

"Is she happily married?"

"Is she? I'll say she is. Why, that girl is so happily married she has to go to the theatre for a good cry."

* * *

As Usual.

As usual, my monthly allowance had run short. Home went a telegram for money, as usual. Back came a cheque for half the amount I asked for, as usual. But I fooled them, for I had asked for twice the amount I needed, as usual.

* * *

Such an Odd World.

In Chicago they tell of a fascinating young married woman who, in the absence of her husband, received much attention from an old admirer. One evening the latter ventured to become reminiscent.

"Ah," he sighed. "If only you had married me instead of Babcock."

"Then I should have been with Mr. Babcock at this very moment instead of with you," answered the fascinating one. "How strangely things turn out"

* * *

The Better Part.

Father-in-Law: "I've asked you here to dinner for the last time, my boy for, I'm sorry to tell you I've lost all my money."

Son-in-Law: "Great Scot. Then I married for love, after all."

* * *

Saving Him Pain.

Boy (to his dad): "Dad, can you sign your name with your eyes shut?"

His Dad: "Certainly."

Boy: "Well, then, shut your eyes and sign my report card."

* * *

The New Labour.

Employer (to clerk who has mislaid papers): "But what the devil can you have done with them?"

Employee (briskly): "Well, sir, that is exactly what I have been saying to myself; 'What the devil can I have done with them?'"

* * *

The Boy Detective.

Helpful Small Boy: "I beg your pardon, sir, but your car was stolen about ten minutes ago."

Car Owner: "Well, why didn't you raise an alarm and stop the thieves?"

Boy: "I never thought of that, sir; but it's all right—I took the number of the car."

* * *

O Liberty!

"I wonder if it's true that good Americans, when they die, go to Paris?"

"One cannot tell; but I think it very probable that bad Parisians, when they die, go to America."

* * *

The Second Reading.

Father: "What are you reading, Caroline?"

Daughter: "A novel, father, entitled 'The Heart of a Poor Girl.'"

"Umph! The usual rubbish, I suppose."

"Yes, dad. It's a book you presented to mother years ago."

* * *

His Name in Full.

He is a negro boy eleven years of age. He peddles fish from a pushcart in Freeport, L.I.

"What is your name?" asked a kindly woman customer.

"Mose, mostly," he replied, "but mah maiden name is Captain."

* * *

Superior Stuff.

"This is elegant whisky, Colonel. May I ask where you got it?"

"Four years ago the field hands wouldn't drink it, so it was stored in the attic. I ran across it the other day."

“THE LONELIEST BRITON”

EIGHT YEARS' EXPERIENCE IN THE SOUTH SEAS

THRILLING STORIES OF ADVENTURE

By ERNEST DAVIES,

In the “Wide World.”

THE mere mention of the South Seas conjures up a life of romance and adventure, of hairbreadth escapes and lonely vigils, interwoven with a gradual absorption of the customs and habits of the native inhabitants.

Truth may not always be stranger than fiction, but there are times when it can claim to be immeasurably more exciting, and the man who spends eight years on the Paumotu Archipelago should taste sufficient of adventure to make him content to spend his remaining days in a less exciting environment.

The Paumotus are not among the oft-travelled, oft-described islands of the Pacific. They lie well off the beaten track, being more than three thousand miles from the nearest Australian and American ports. They consist of between forty and fifty low coral islands or atolls, and have no direct communication with the rest of the world, which consequently hears little of them.

My claim to be the “loneliest Briton in the world” was due less to the remoteness of these islands than to the fact that they possess as yet no port of call, although steamers bound for California and the Panama pass within sight. Some of the atolls have capital natural entrances, capable of admitting big ships, but no attempt has been made to construct a proper harbour, and so the ships content themselves with looking at us from afar. I should further explain that I happened to be the only Britisher in the group, the other white men, of whom there were three, consisting of two traders and a priest, being French.

My acquaintance with the islands had its origin in a copra-trading venture, promoted in 1912. I was appointed secretary and accountant to a company formed for the purpose of leasing coconut trees from the natives, and exporting copra. Owing to the difficulty of enforcing contracts, and to disputes over the titles to the various

lands hired by the company, the project, after a few months' activity, was abandoned; and it was then that I decided to start trading on my own account. In the short time that I had lived among them I had learned to like and respect the natives, a fine, upstanding race of people, hospitable and reliable to a degree. A knowledge of their language, picked up in a few weeks, enabled me to feel, comparatively speaking, at home among them, and it was not long before I found myself as familiar with them and their habits as if I had known them all my life.

A trader's life in the Pacific, although not subject to a rigorous routine, would be somewhat dull were it not for the unexpected and out-of-the-way little incidents that are almost certain to crop up from time to time. Quite early in my stay, for instance, I was involved in an entirely unlooked-for adventure that might well have had infinitely worse consequences than, happily, it did.

I had gone fishing in my canoe with Pioi, my boy, and two other natives. We had taken plenty of tackle with us, as the spot where we intended to fish, an inlet close to the entrance to the lagoon, had the fearsome reputation of being the rendezvous of half the man-eating sharks in the Pacific. In the ordinary course of things the natives adhere to the primitive custom of diving for fish and killing them with a spear; in this instance, however, the habit was impracticable, or at any rate unsafe, hence the fishing gear.

But my boy Pioi was nothing if not adventurous. Patience was not one of his virtues, and hardly had we reached the fishing-ground than, after vainly trying to kill a fish from the canoe, he jumped overboard, spear in hand. Half a minute afterwards we became aware of a commotion on our starboard side; the canoe began to rock violently, while the crystal clear water was rapidly being churned into foam. The other

two natives grasped the situation at once. Pioi, they explained excitedly, was being attacked by a shark! In less time than it takes to record the fact, they had leapt from the canoe to join their comrade in his fight with the monster, while I looked on, fascinated, extremely apprehensive as to the result of the contest.

Three minutes later—the expert native diver can remain under water for longer than this period: officially-timed tests show that many of them can stay below the surface for close on four minutes—I realised that I was without the means of navigating my small craft, the natives having let the paddles fall overboard in their excitement. In consequence, I was drifting rapidly away from the scene of the fight. The current was running at five knots an hour, and before anyone on shore noticed my predicament I was swept right out into open water, where the canoe at once assumed the helplessness of a cork on the high seas. I remember shouting, and gesticulating wildly with my arms; then there came a sudden lurch, as a roller struck the canoe, and the following instant I found myself in the waves, clinging for dear life to the smooth, keel-less bottom of the canoe, and wondering whether it was my fate to be drowned or—and the thought of the horrible alternative caused me to shudder violently—eaten by a shark.

A lifetime seemed to elapse between the moment of my immersion and my ultimate rescue. In point of fact, I was only a quarter of an hour in the water, but it seemed a lifetime—one in which I experienced the accumulated horrors of a career that has had possibly more than its share of them. The height of Grand Guignolism was surely reached when, after breathlessly glimpsing an ominous-looking fin twenty yards away, I became aware of a sudden disturbance under the upturned canoe. Something slid by my leg, causing me to yell involuntarily—and a hefty porpoise playfully leapt into the sunlight within a few feet of me!

That porpoise undoubtedly saved my life, for the yell that I gave as a result of contact with it, under the impression, of course, that it was a man-eater, was heard on shore. Twenty minutes later I was sitting in my hut, listening to Pioi's account of his successful fight with the shark, and rather shamefacedly realising that, in spite

of the fact that his peril had been the greater, he was by far the least perturbed of the two of us.

And here, perhaps, I may point out that, although man-eating sharks abound in these waters, they do not often attack human beings, unless molested, in which event they are not slow in giving battle. Pioi, whose anxiety to acquit his monster enemy of all blame for initiating the fight was almost comical, explaining that the shark, a twenty-footer, was swimming in pursuit of the fish he had hoped to spear, and that he had foolishly prodded it in the eye, whereupon the shark turned on him. I have, however, frequently seen the largest sharks cruising about quite close to diving natives without showing the slightest interest in their movements, and I think there is no doubt that, as a rule, a shark will not attack except in self-defence. Exceptions, of course, there are, and one of which I was a witness seven years ago has left me with an impression of horror that will not soon be effaced, as I shall show at a later stage in my narrative.

I had not been long on Raroia before discovering that in and about the islands there were monsters more dreaded than sharks. Octopuses grow to an enormous size, and attain enormous strength, as a result of which they inspire great fear in the natives. The local folklore, which I have studied somewhat exhaustively, is full of tales of adventures with these fearsome creatures—adventures which, I fancy, easily eclipsed the epic fight with an octopus described in Victor Hugo's great novel, "Toilers of the Sea." I have seen an octopus with tentacles twelve feet long, capable of crushing the life out of a full-grown bullock—a combination of evil power and sinister purpose which, beheld in action, makes one almost sick with horror.

Sailing along the outer reef of Mahitu one day, I heard a shout, and, running aft, saw one of our pigs disappearing over the side without so much as a squeal of protest. Clapsed about its middle was the slimy brown tentacle of an octopus, which was hovering just below the surface ten feet away. Some of my boys tried to kill it with their tomahawks, by slashing at its sinuous arms, at which the creature let go the pig and gripped the side of the boat. The boys inflicted several terrible wounds, which presently had the effect of causing

the octopus to release its hold on the boat and again seize the pig, after which it slid silently away, in a wave of deepening crimson. These creatures are extraordinarily tenacious of life. They seem to die only when every artery and every tentacle has been severed, and in death their eyes glint a hate that is not easily forgotten.

But while the shark and the octopus between them contrive to give the natives—and, for that matter, anyone else on the islands—a fair share of shocks and adventures, there is another denizen of the deep thereabouts who manages to inspire one with an even greater fear. I confess that I seldom find it politic to refer to this creature in relating my experiences to my friends, since most of them are inclined to regard the matter as a weak attempt at joking on my part. However, I can be sure of obtaining an impartial hearing from readers, and I will therefore cite the facts as they occurred, leaving my audience to form its own conclusions.

The Sea-Serpent.

I first became acquainted with the existence of what I can only describe as a first-class sea-serpent while at anchor in Nihiru. It was a particularly hot night, and, with four natives, I sat smoking on the poop of the schooner *Noidore*, the natives being engaged in desultory conversation, while I sat by, a scarcely-interested listener. The night was clear, there was hardly a ripple on the water, and soon the sonorous voices of the boys began to lull me into a state closely approaching sleep.

I was enjoying a comfortable doze when one of the boys sprang to his feet and, with a shout of fear, pointed to a dark object in the sea, twenty yards away. At once the rest of us were on the *qui vive*, our gaze fastened on the object, which was proceeding towards us in a leisurely fashion, little plumes of foam breaking away on either side of what was evidently its head. Fascinated beyond description, we stood watching the creature approach the ship, against which, having come alongside, it rubbed what seemed—for our tense nerves sensed every movement—to be its abnormally long body.

Then, apparently finding no way round the obstruction, the monster suddenly raised itself partly out of the water, until its head was practically level with the main deck, from which vantage-point it

scanned us with eyes that, I freely admit, momentarily scared the wits out of me, while the boys literally shook with fright. In retrospect the incident seems as if it occupied many minutes, whereas actually, I suppose, it could not have lasted more than a few seconds—long enough time, let me say, in which to convince me of the truth of the old claim that there are more things in heaven and earth than are dreamed of in our philosophy; in mine, at any rate!

Exactly what these creatures are I have not yet been able to decide; as I have said, people who have never seen or heard of them are apt to shrug their shoulders in a manner that indicates doubt of one's sanity. Yet many of my friends in the Paumotu, old natives whose word I have learned to trust, will solemnly affirm, with all the emphasis of which they are capable, that men have been carried off ships' decks by these monsters, some of which attain an almost incredible size. A tidal wave which visited the archipelago deposited on the reef of Nauna Island a dead monster measuring no less than fifty-three feet in length, with a girth of twelve feet at its thickest part! Personally, after the experience I have just related, I am in no doubt as to the existence of some kind of marine monster of which very little is known, and for which "sea-serpent" is the most apt designation I know.

A minor adventure of mine, not without interest, as showing the unexpected strength of the turtle, a creature not usually credited with being exceptionally powerful or courageous, may be quoted here. It occurred soon after I arrived on Raroia, and when I was as yet unused to handling these creatures. Seeing one of them come ashore to deposit its yearly batch of eggs, I sought to intercept it on its return to the sea. My inexpert method of capturing it, or rather, of trying to do so, was to fall on it from behind—a proceeding which, though it no doubt occasioned the turtle some surprise, did not deter it in the least from continuing its progress to the sea. As soon as it reached the edge of the water I attempted to slide off its back, whereupon the creature struck out with its flappers, catching me a blow on the side of the head that completely knocked me out for some minutes. After that I was glad to tackle turtles only in the approved fashion, that

is to say, by throwing them on their backs, a feat which demands the exercise of a considerable amount of strength. I have helped to handle turtles measuring twelve feet round their shells, standing three feet from the ground, and weighing five hundred pounds and more. As to their courage, I was greatly surprised one day to see a turtle tackle a dog and keep him at bay, during a fight that lasted for several minutes. So far as I am concerned, Louis de Rougemont's claim to have ridden turtles was vindicated some time ago, for I saw the natives of my island on more than one occasion disport themselves in this way.

Most people, in looking back over the years gone by, can recall one experience, or set of experiences, that stands out in the memory more prominently than any other. If I were asked to name the experience that is most firmly fixed in my memory, I should have no hesitation in recalling the adventure I now propose to relate. The story may lose a little of its flavour in the telling, but what true stories of adventure do not?

One feature in the make-up of the Pautotus natives that struck me forcibly as soon as I was able to converse with them was the extraordinary faculty many of them possessed of foretelling coming events. I would not call this faculty the gift of prophecy so much as a sort of prevision, which enabled them literally to see into the future. A single instance of this will suffice, and as it actually preceded, and had a direct bearing on, the experience I am about to describe, I will narrate the whole episode exactly as it happened.

In 1914, two years after settling in the archipelago, I got the news from a passing schooner that there was a copra boom in San Francisco. Prices, I learned, were soaring, and fortunes were being made, and might still be made by anyone who could, to use a common expression, "deliver the goods." Seized with a desire to participate in any superfluous wealth that the copra market could offer, I secured a fifteen-ton cutter, the *Taoa-te-Noana* (Treasure of the Sea), and filled her with about twenty tons of copra. In my enthusiasm, which was shared by my hastily recruited crew, we overloaded the ship, taking in several tons too many on deck. On the day of our departure my boy surprised me by falling on his knees and begging me not to

go, saying that his mother, in a sort of vision, had seen me struggling in the sea, with the capsized craft close by.

Now, things psychic, however important and far-reaching they may be, are outweighed in most minds, my own included—at least, at that time—by things pecuniary. The only portents to which one pays attention at the height of a financial fever are those connected with the state of the market; and so it was that at three o'clock on the afternoon of June 8, 1914, we set sail, leaving my boy wringing his hands in lamentation at my refusal to abandon the trip.

A Disastrous Voyage.

With eleven souls on board, including eight natives, three of them women, a Chinaman, a Chilian, and myself, we stood out to sea, after having successfully negotiated the reef. The day was calm, and everything seemed fair for the sailing, although after setting the course I had a rather more than vague idea that we were carrying too much top-hamper. Towards evening a breeze sprang up, and soon we were bowling merrily into the night, with no thought of impending trouble in our minds.

In the South Pacific storms and squalls have a habit of springing up without warning. It was nearing midnight when I became conscious of the approach of a high wind, which by the time it reached us had developed into half a gale. I took in a couple of reefs and kept a careful watch on the weather. At two o'clock in the morning the stars, which up till then had been shining brightly, were blotted out by the onrush of the storm, and at a few minutes before three a particularly sudden squall capsized the ship!

Daybreak, which seemed as if it had been indefinitely postponed, found ten of us hanging to the boat, which was floating on her side, the eleventh, the Chilian, having apparently been caught in the jib sheets, as he was lying forward overnight, and sent helplessly to his death. Our attention was distracted from this disaster, however, by our own plight. Righting the cutter proved to be a much more simple operation than I had imagined. The natives fastened a line to the mast and, by making use of the wind and tide, soon had her back into her normal position, after which we were quick to scramble aboard. A hurried inspection showed me that everything portable had

parted company with the vessel, a few pieces of copra in the hold comprising all the food that was left.

The six succeeding days formed a continuous nightmare, on which even now I do not care to dwell too intently. With the bits of copra as our only means of sustenance, and a pint or so of water, caught in a sail during a night shower, for drink, we drifted into a state so closely bordering on desperation that I find myself still wondering how we managed to retain our sanity. Not the least of our privations were those occasioned by the heat of the sun, which beat down on us with truly appalling intensity. Our only escape from it was provided by the hold, which, however, was flooded to a depth of three feet or more. Still, we were glad to take refuge in it during the hottest hours, although its atmosphere was only a few degrees less oppressive than that outside.

On the third morning the Chinaman, abandoning with the fatalistic philosophy of the Oriental, every hope of rescue, committed suicide by jumping overboard, after a last despairing gesture of farewell. His end was a horrible one. Hardly had he touched the water than he was torn to pieces by sharks and porpoises, a number of which had been following us for some hours past. The appearance in their midst of the poor fellow's body led to a battle between the two schools—a mighty, primeval combat, in which the porpoises frequently drove off the sharks. The latter, I noticed, returned again and again to the scene, until, with the coming of night, we lost sight of them.

By this time the natives were beginning to lose heart, and lay about the ship in attitudes that betokened the deepest despondency. Now and again one of the boys would pray aloud to the gods of his fathers, beseeching a speedy release from the torment of hunger and thirst, but for the greater part of the next three days an uncanny silence reigned in the ship. Once or twice I tried to cheer them up, by declaring that I had studied the currents and knew that in a few hours we should drift in to the phosphate island of Mokatea, but my own spirits were so low that I found it impossible to communicate to my companions an optimism which I did not feel, and so I gave up the attempt, lapsing into a mood of acute depression that was torture while it lasted.

At about 1 a.m. on the sixth night, a night that was full of stars but devoid of all promise of rescue, one of the boys, gazing seaward with eyes that refused to close in slumber, suddenly jumped up and, pointing ahead, cried out that he could see land. In a moment we were all on our feet, our gaze concentrated on a dense black object which loomed up several hundred yards away. Staring into the night, I decided, with spirits that sank as rapidly as they had risen, that the object we were looking at was nothing more substantial than a cloud. Nothing, I think, would have dissuaded me from sticking to this opinion had not a light suddenly gleamed out from the dark mass—the light of a steamer!

For the space of a few seconds it looked as if we must inevitably be run down, but that possibility did not trouble us greatly. The state of our mental processes at the time was such that we really cared little whether we were sunk or saved. This, at least, was my own feeling. But the instinct of self-preservation, which had been burning very low, suddenly flared up in our breasts, and we managed, as a result of our concerted efforts, to attract attention by yelling, though I tremble to think what would have been our fate had there been a heavy sea, or a high wind, for our weakened voices most certainly would not have been heard above the noise of the elements.

To our intense joy the vessel—a British tramp, the *Prometheus* (Captain Garlick), bound for Dunedin, New Zealand—stopped; her searchlights were turned on, and very soon we were safe and tolerably sound on her deck, where the ship's doctor promptly took us in hand. Despite his efforts, one native died as a result of exposure a few hours later. When I was able to get about again, a matter of two days or so, the captain informed me that it was a ten-thousand-to-one chance against our being picked up, as the course he had followed on this trip was very rarely taken by ships. It only remains to be added, I think, that my ship and cargo were uninsured—there had been no time for this preliminary in the scramble for San Francisco—the cargo alone costing me well over one thousand pounds.

The Wild Man of the Islands.

It was shortly after returning from this disastrous voyage that I had an experience which, although it gave me no untoward

excitement or thrills, may serve to interest many of my readers. Cruising one day through the archipelago with a small native crew, I noticed a curious-looking figure sitting on a rock. We were about two hundred yards off, and the creature, which looked strangely like a human being—as, in fact, it proved to be—had apparently not seen us. A studied inspection through my glass revealed a copper-coloured, long-haired man, with hairy limbs and hands like talons, so long were the nails. A few seconds later he looked up, saw us approaching, and with a bound leaped into the sea.

I had heard of the man's existence in the archipelago, and was therefore not wholly astonished, though I am bound to say that in appearance he was even less prepossessing than reports had made him out to be. This strange wild man of the sea is said to

be a descendant of one of the crew of the *Bounty*, who mutinied, as is well known, a century ago. A few years ago he went mad, and swam from Piteairn Island to another island forty miles away. From thence he swam to another island, and so on, with the result that he is now to be found, or was, when I left last year, in one of the smaller archipelagoes near the Paumotu. The strangest part about his history is this: that he has been seen on islands as far apart as a hundred miles and more, with no intermediate landing-places. How, then, does he travel from one distant island to another, That any man can swim a hundred miles sounds almost incredible, yet there seems to be no doubt that this madman of the South Pacific actually does cover what are, relatively speaking, tremendous distances in this way.

PERSONAL

The Directors and Departmental Managers of Amalgamated Wireless (A'asia), Limited, tendered a farewell luncheon to Mr. E. T. Fisk, the company's managing director, at Farmer's, Sydney, last month, prior to his departure for England.

Mr. Fisk sailed from Australia in the new Aberdeen liner *Sophocles*, and voyages to London via South Africa to make the necessary arrangements for the establishment of direct wireless communication between Australia and the United Kingdom.

It was reported in the Press last month that under the agreement between the Commonwealth Government and Amalgamated Wireless, Ltd., the following directors had been appointed:—

Commonwealth representatives: Sir William Vickers, Messrs. Stinson and Mason Allard.

Amalgamated Wireless, Ltd., representatives: Messrs. C. P. Bartholomew, E. T. Fisk and Captain T. Langley Webb.

Mr. W. R. Blow, N.Z. Government agent in Sydney, left in the *Makura* last month for a visit to New Zealand. During his absence Mr. J. W. Clarke, of the Melbourne office, will take charge in Sydney.

Before concluding his address at the

annual meeting of shareholders in Burns, Philp & Co., Ltd., recently Sir James Burns, who presided, referred feelingly to "the great loss sustained by the company since the last annual general meeting in the much-regretted death of the late general manager, Mr. P. G. Black." Their late colleague, he added, was also a director, and had been associated with the company for nearly 40 years. The vacancy on the board created by the death of Mr. Black has been filled by the appointment of Mr. R. J. Nosworthy, the secretary, whose service with the company extends back to the year 1883.

Mr. J. S. Cormack, who was recently appointed to the position of Director of the N.S.W. Government Tourist Bureau, occupied the position of acting-director for a considerable period. His permanent appointment to the position was well merited by the excellent work he has done in making the beauty and utility of New South Wales known both at home and abroad. Mr. Cormack is personally popular, not only with those who know him intimately, but to the countless thousands with whom he comes in contact each year. He has received numerous congratulations since his appointment was announced.

AERIAL DERBY.

HIGHLY SUCCESSFUL EXHIBITION

CAPTAIN NIGEL LOVE WINS DOUBLE

IF any doubts were entertained as to the Sydney, the great crowds who journeyed to Victoria Park racecourse on Saturday afternoon, May 6, effectually dispelled them. When it is considered that only a limited amount of money was available for advertising purposes, and there were so many strong counter attractions held in close proximity to the city on the same afternoon, the Aerial Derby of 1922 must be regarded as a distinct triumph. An enthusiastic committee, with Major A. Barton Adams, R.A.F., Club President, at its head, and Captain R. W. Perkins, R.A.F., as Hon. Organising Secretary, had worked hard for many weeks in perfecting the details, and all concerned must share in the brilliant success which rewarded their efforts.

Pessimists Confounded.

If there were any pessimists present when the 'planes lined up ready for the start they must surely have felt ashamed of cherishing such gloomy thoughts as that anything could befall those graceful machines and their skilled pilots. Many there were who freely expressed the opinion beforehand that "something would go wrong," and absented themselves because they were not fond of thrills. Could those people have been present to witness the 'planes take off gracefully, one by one, in

the face of a gathering storm, with a chill wind speeding heavy banks of clouds across a previously sunny sky, they would surely have found their pessimism giving way to confidence, and later to admiration, at the calm and unconcerned manner in which the pilots guided their machines into space. Within a few minutes the first 'plane to take off became a speck to the naked eye,

and as each succeeding one set out on its fifty-five mile journey the upturned eyes of thousands of people followed their progress.

The Race Described.

The wisdom of choosing a circular course, where the machines would be in view the whole time, now became apparent. The *Curtiss* 'plane piloted by Captain Holden led at the end of the first lap, 11 miles, covering the distance in 11min. 38 $\frac{3}{5}$ secs. When the machines came round the second time the field (to use a racing term) had closed up a little, but the order was unaltered. On the third lap Captain Love apparently made up his mind that it was time to make a spurt. Accordingly he opened up his engine and so well did the machine respond that he gained quite three minutes on the leaders. His time for the third lap was 9min. 7secs., which works out at almost seventy-five miles per hour. The remaining two laps were covered at a good speed, and as each machine finished its flight a safe



Captain Nigel Love, winner of the Aerial Derby and Handicap flown at Victoria Park Racecourse on May 6.

and steady landing was effected, the *Avro* piloted by Captain Love winning by approximately 1min. 8secs.

Colonel Brinsmead's New Role.

Lieutenant-Colonel Brinsmead, Controller of Civil Aviation, acted as course steward during the flying of the Derby, and some time before the first 'plane ascended he commenced circling around inside the course, and continued his observations until the event was over. Probably there was no thought in the minds of the organisers that any unfair practices would be indulged in by the competitors, for airmen are known to be clean sports, but at the same time the spectacle of a 'plane circling around in close proximity to the competitors gave a realistic touch to the whole proceedings, and was a further evidence of the thorough organisation which characterised the work of the committee.

Results by Wireless.

A wireless party composed of men of the First Cavalry and First and Second Divisional Signal Corps, equipped with a military half-K.W. pack set, occupied a position on the course proper, the station being in charge of Lieutenant O. F. Mingay, assisted by Lieutenant G. D. Davis and Sergeants J. Adams and J. Dewis.

A military receiving set was also located in the *Evening News* office in Sydney, and another at the Engineers' Depot, Moore Park. By this means the result of the various events was transmitted from the

course to both receiving stations in an incredibly short space of time. In fact so successful was the demonstration of the speed and accuracy with which the news could be transmitted that afterwards Colonel T. Williams, General Staff-Officer for Army Signals, expressed his gratification at the success achieved by the signallers. In his opinion the demonstration of the value of wireless for newspaper reporting as evidenced by its use in the case of the Aerial Derby, was but the forerunner of its general adoption for newspaper work.

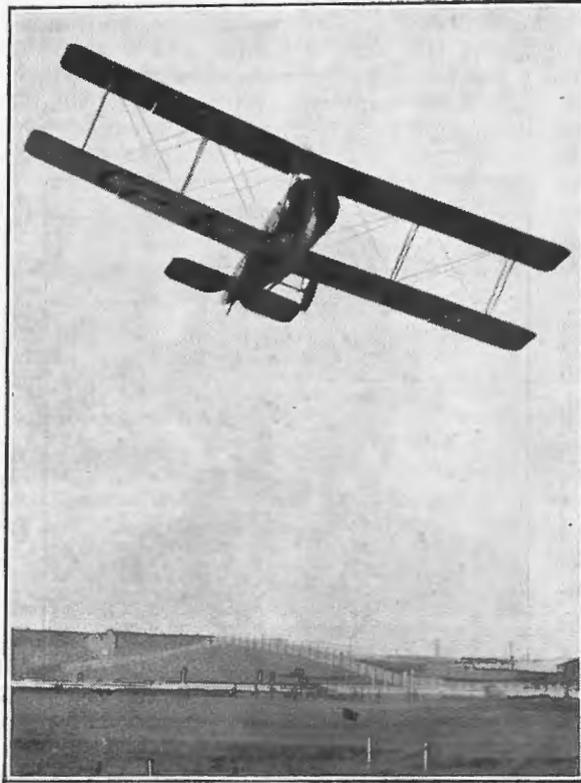
Trophies Presented.

At the annual dinner of the Australian Aero Club, held on the evening of Derby Day, the Chairman, Major Barton Adams, expressed his intense gratification at the success of the afternoon's exhibition.

Sir Thomas Hughes, in presenting the trophies to Captain Nigel Love and Mr. S. Harper, winners of the Derby and Handicap and the Oswald Watt Memorial Handicap respectively, paid a tribute to the healthy rivalry

which existed amongst the pilots. It was a most promising sign, and, coupled with the good management of the committee, the enthusiasm of the public and the skill of the aviators, all of which had been amply evidenced that day, he was hopeful of great things ahead.

Captain Love, in returning thanks, eulogised the good work of the organisers, which had contributed so largely to the success of the carnival.



An "Avro" rounding a turn on the first lap of the Aerial Derby.

Helping Aviation.

Lieutenant-Colonel Brinsmead, Controller of Civil Aviation, spoke of the enormous amount of work necessary to successfully stage an event such as had been witnessed that afternoon. Everything depended on the staff work, and in this instance the members had risen to the occasion as usual and carried out their duties in an unexceptional manner.

Captain R. W. Perkins, Hon. Organising Secretary, and Captain Geoffrey Hughes had proved of inestimable service, and they might well be described as the Club's greatest assets.

Captain Geoffrey Hughes announced that approximately six thousand people had paid for admission, the gross receipts exceeding £600.

During the afternoon a number of motor cycle events helped to keep the spectators interested.

The aerial events resulted as follows:

Aerial Derby.

Captain N. Love, <i>Avro</i> (100 <i>Dyak</i>),	time 46min. 35 $\frac{3}{5}$ secs.	1
F. S. Chapman, <i>Avro</i> (100 <i>Dyak</i>),	time 47min. 43 $\frac{1}{5}$ sec.	2
Captain W. Percival, <i>Avro</i> (80 <i>Renault</i>),	time 48min. 36sec.	3



Some of the officials watching the progress of the 'planes in the Aerial Derby at Victoria Park Racecourse on May 6. The figure on the extreme left is the Hon. Sir Thomas Hughes, M.L.C. (judge), the third figure from the left is Major A. Barton Adams, R.A.F., President of the Australian Aero Club, and the last on the right is Mr. C. B. C. Williams (starter).

A gathering such as had been held that afternoon did an enormous amount of good to aviation, as it demonstrated to the thousands of onlookers that flying was safe. He was confident that in a few years it would be quite commonplace, and people would leave for England or America with only a press paragraph to announce their movements.

The other starters finished in the following order:

- Curtiss*, 100 *Curtiss*, Captain Holden.
- Avro*, 100 *Dyak*, J. Treacy.
- Avro*, 130 *Clerget*, S. Arthur.
- Avro*, Triplane, 160 *Beardmore*, H. Fysh.

The Handicap.

Although no doubt existed regarding the actual winner, a difference in the times



A number of the 'planes which competed in the Aerial Derby. The triplane in the foreground was piloted by Lieutenant Hudson Fysh, of the Queensland & Northern Territory Aerial Services Limited.

caused some discussion regarding the places. Eventually the places were decided to be:

Captain N. Love, <i>Avro</i> (100 <i>Dyak</i>)	1
Captain H. Fysh, <i>Avro</i> Triplane (160 <i>Beardmore</i>)	2
Captain F. Chapman, <i>Avro</i> (100 <i>Dyak</i>)	3

Oswald Watt Memorial Handicap.

Three laps of Derby course, thirty miles. Competing machines handicapped on their speed performances in the Aerial Derby. Prizes: First, Cup Trophy and cash prize of £10; second, £5.

<i>Avro</i> , 130 <i>Clerget</i> , S. Harper	1
<i>Avro</i> , 80 <i>Renault</i> , W. E. Percival	2
<i>Avro</i> , 100 <i>Dyak</i> , F. S. Chapman	3

AEROPLANES OF YESTERDAY

We made 'em of tin, of pine and bamboo,
We tied 'em with string, we stuck 'em with glue,

We hammered 'em out in various ways,
We patched 'em together with strings and stays.

Where knowledge is guess work, guesses
must serve,
And we knew that to fly, the wings must
curve,

So we turned out the curves as we turned
out the rest,

Products of chance, performance un-
guessed.

We made our designs with chart and
stencil,

With foot rule, paper and bits of lead
pencil;

We turned out the camber and angles at
will,

And we knew that the factor of safety
was nil.

But for all the defects of those wicked old
hacks,

We flew and survived the inevitable
cracks,

And those who performed on these ships
of the past,

Have gone to their rest, all famous at last.

And for all the tacks, the strings and the
glue,

They answered our purpose, the old crates
flew

They answered our purpose, and more can
we say,

They made the game what it is to-day.
As we ride the new ships constructed to
please,

And lounge in upholstery in safety and
ease,

Let us pause for a moment and toast while
we may,

Those flimsy, rickety crates, the ships of
yesterday.

LIEUT. A. PEIRCE, in *The Aerial Age*.

LIFE ON A SAILING SHIP 60 YEARS AGO

DAYS OF HARDSHIP AND CRUELTY

HOW CONDITIONS HAVE CHANGED

By MAJOR A. J. BOYD

THE good old merchant ships which carried on the world's sea-borne trade, and depended on the winds for their motive power, have practically disappeared from the long ocean routes, displaced by modern leviathan steamers and oil-driven ships. Iron hulls, too, have been substituted for the stout timbers which served their purpose for so many years. Even the very masts, yards, bowsprits and carved figure-heads have been abandoned, and with all these changes the characteristic sailors of Marryat's days no longer tread the deck. The mode of life, too, and the arduous duties of these heroes of the windjammers' crews have so radically changed that those who to-day man the universal steamships, deserve rather the title of "seamen" than of "sailors," seeing that they have no sails to attend to.

In the old days the term "floating hells" aptly described many of the vessels afloat. The stern discipline and the hard, rough life were responsible for this. Especially did the term apply to American merchantmen, which were frequently manned by a class of incorrigible ruffians, who were ready for mutiny at sea and desertion in port. Others, again, had possibly been carried off through the agency of men, who kept them in low boarding houses for days or weeks until the master of a ship with cargo on board, being shorthanded, made a bargain with the crimps by which the latter agreed to place on board the number of men required for a good round sum. The men so obtained were made drunk and kept in that condition until they recovered sufficiently to find themselves in the fo'c'sle of the ship, which was by that time at sea, and there was no chance of returning to the shore. To add to their troubles, they were not provided with a change of clothes or boots, and a ragged blanket was their only possession in the shape of bed covering.

This crew traffic was called *shanghaiing*, and was carried on to a large extent in South American ports, from where many vessels sailed for their destination, *via* the

Cape Horn route, on which voyage the *shanghai*ed men suffered terribly from the cold, and some even died before reaching the tropics.

The writer once shipped on an American sailing ship on a voyage from New York to the Chincha Islands, off the Peruvian western coast, to load guano, and thence round Cape Horn to Cork for orders. The vessel was named the *Constantine*, a full-rigged ship of 1,700 tons, and was one of the Grinell Swallow-tail Line.

I joined her at Port Melbourne, and followed my sea-chest to the crews' quarters, where I was introduced to my future shipmates, six in number. The place consisted of a fairly large room, with a fixed dining table, which, in addition to being used for meals, served such purposes as writing, reading, etc. The occupants of the berths were the boatswain, carpenter, third mate, and four apprentices, of whom I was now one. The chief mate and the second took their meals in the captain's cabin, and had each a small room on the port and starboard side of the wheelhouse respectively.

The ship was a wooden one, of great length and very broad beam. She carried a large spread of sail from the three courses to the three royals, with the main and outer jibs, spanker and staysail wherever there was room for them, fore and aft sails, and I afterwards found that she was well provided with sternsails from the lower to the top gallant sails.

Like all American ships, her masts terminated in long, tapering poles, through the truck of which the signal halyards were rove, and the vanes finished them off. As the *Constantine* was a passenger ship, she had a fairly large first-class saloon, and another larger room for second-class passengers, with comfortable cabins on either side. The fo'c'sle, or, as it was called by the men, the sailors' parlour, was a den right for'ard, which to-day would not be tolerated in a cattle ship. In the for'ard bows were the hawse holes, through which the anchor chains passed to the windlass, and

which also admitted liberal supplies of salt water, deluging the floor and damaging the contents of the sea-chests. The sleeping accommodation was such as would have roused the righteous anger of Australian seamen, and consisted of a few rough bunks in two tiers, and even these were scarcely ever dry, as the deck overhead leaked badly. The only light in this den was supplied by a stinking can, with a long spout like a tea-kettle, through which a cotton wick passed.

The crew, divided into watches, port and starboard, were located on the respective sides of the ship under equally filthy conditions. It may well be imagined what a dreadful place this was, especially in wet weather, when the men's wet clothes hung all over the beams and bulkheads. Will it be believed to-day that this was the only place whither the men, after drawing their wretched rations, retired to sit on their chests, and eat out of a tin dish and a pannikin. As for knives, every American sailor and those of other nationalities sailing in United States merchant ships carried a sheath knife in his belt, and he was apt to use it when driven to desperation by the brutality of the officers.

So much for the men's paradise! How about the officers? Some of these were mere semi-educated brutes, who could navigate a ship, but beyond that they were as rough as those over whom they had power of life and death. It was an understood thing that, as a rule, the captain made the bullets, and the mates fired them. Mention has already been made that two of the officers were berthed in comfortable rooms in the wheelhouse. The captain occupied the saloon, where he reigned supreme, there being no passengers on this occasion.

Finally the black cook and his wife were berthed in one of the second-class cabins. There were two stewards, one for the saloon, and one for our mid-ship quarters. Ours was a rather good lad, but the captain's servant was a spy on the actions of men and officers, and much punishment fell on men who had been reported by that scoundrel.

The life and work of the crew—20 in number, exclusive of four apprentices, officers, boatswain, carpenter, cook and stewards can only be described as wretched. All but five were rated as able seamen. The mate, who joined in Melbourne, was a good-natured Englishman, the second was a Scotchman, and the third hailed from

Liverpool. The captain lost no opportunity of grossly insulting them in the presence of the men, the consequence being that they had no respect for him, and ignored his orders with impunity.

The sailing day having arrived, the anchors were weighed, the cables stowed, and we left Hobson's Bay with a fair wind on the first stage of our passage to Callao. Beyond a little trouble between the captain and his officers, nothing serious occurred until we arrived at our loading port, where a violent quarrel took place between the commander and the first mate, and the latter was ordered ashore. All formalities having been settled with the Peruvian authorities, we were assigned a loading berth at the Chinchas Islands, where we were destined to remain for over three months, the "laying days" as the time required for loading a couple of thousand tons of guano were called, having been fixed at 100. Two days after this period expired we sailed for the Crinchos with a head wind which lasted during the passage, and we took ten days to beat down to the islands. We secured a berth amongst three or four hundred ships from all parts of the world, all bent on loading some thousands of tons of the valuable chemical manure. Many days later the first lighters reached us with a few tons to be taken on board. No leave was now granted to any member of the crew, as it was feared that some of them might be *shanghaied*, in which case they would lose all pay due to them, and possibly would find themselves in for a three years' cruise in a south sea whaling ship. Now began a series of quarrels between the captain and the men. A new mate had been engaged, but he proved incapable of dealing with a discontented crew and a savage captain. One day the latter abused him for allowing the men to rest for a few minutes. The mate said he knew his duty, and did not require to be taught. In a moment the captain seized him and threw him over the side into the lighter, and threatened him with a revolver if he attempted to climb back into the ship. The man was helpless, there being no law at the Chinchas to which he could appeal. Another mate was afterwards obtained, and I was the cause of his dismissal. He was a savage German Yankee, and threatened to shoot me, at the same time rushing to the wheel house for his revolver. I bolted down the saloon stairs, and ran against the

captain. Just as I did so the mate appeared at the top, with his revolver. The old man, as the captain was usually called, rushed to the deck and dealt the mate a savage blow. The latter fell, and dropped his pistol, which the captain picked up, and swore that if he did not jump overboard he would shoot him dead. "Kill one of my boys, would you!" he exclaimed. "If you're here two minutes longer, I shall shoot you, so just get at once." The wretched mate jumped overboard and swam to the lighter. Before we left the island we had a regular mutiny among the men, owing to the disgraceful food they were given. About six of them decided to go aft with a portion which had been given them for that day's dinner. The spokesman asked the captain if the food was fit for sailors, at the same time handing him the dish of meat. The former affected to smell it, and declared it was perfectly good. Angry words followed, and the captain sprang at him, knocked him down, rubbed the meat all over his face, and dealt him some savage blows, and a tremendous kick in the body. He then signalled to the guard ship to send some armed soldiers on board the *Constantine*. Soon a dozen men came on the quarter deck with fixed bayonets. The captain told the Peruvian officer to take the sailor he had so ill-treated and about four others of the deputation and put them in irons on the guard ship. This was done, and some shore men were engaged to assist in loading. It would be wearisome to recount more of this captain's savagery. Men were flogged terribly; two of the apprentice boys were stripped and each given a savage lashing with a rope. The poor lads became unconscious, and well they might, as their backs were badly mangled. At last he got a long Down-East Yankee, who was a perfect fiend in the way of dealing with sailors. He had no fear of being prosecuted, as there was no law for foreigners.

All these incidents were recorded in the log kept during the Peruvian sojourn and afterwards on the long voyage to Ireland, when every day there was knuckle dusting, knifing and shooting. Such were the conditions existing sixty years ago between sailors and officers in the mercantile marine of the United States of America. Such acts of cruelty were unknown on board English ships, and on those of the Aberdeen Line conditions were all the foremast

hands could wish. They were well fed, and the relations between masters, officers and men were excellent. This good feeling was very apparent on board a *Blackball* liner, an immigrant ship which brought some hundreds of immigrants to Queensland. Captain, officers, doctor, purser and crew all appeared like a happy family.

Since the times written of owners of trade ships, such as the splendid American clipper ships, built and fitted for speed, like those engaged in the China tea trade, which, with favourable winds, could travel at the rate of 14 knots per hour, have vastly improved the position of both officers and men. The men's quarters have been rendered clean and habitable, while the provisions supplied are ample and varied. Wages are also on a more liberal scale, and the sick are no longer at the mercy of captain and mates, who considered the sick man a malingerer to be dosed with the only medicines on board—pills and black draught, administered without any consideration as to the particular form of sickness from which the patient was suffering.

With the passing of the sailing ships and the advent of the splendid steamships, the treatment of seamen has improved in every respect. They are comfortably housed, cheaply clothed from the slop chest, and well fed. Corporal punishment is a thing of the past, and sailors are no longer slung to the spanker boom, with their toes touching the deck, for hours at a time. In an old log book, which apprentices had to write up every day, numbers of instances of mutiny, followed by savage punishments, as well as vain attempts at murdering officers during the night watches, are recorded. These attempts often took the form of a sheath knife falling from aloft, half-cutting through hand lines on which the obnoxious officer depended for his life when he had occasion to go over the head and look to the state of the jib boom and its tackling. In another log book several cases of cruel floggings of men and boys recall the horrors of those dark days. Nowadays such doings no longer find a place in the discipline of a ship, and the true sailor can follow his noble profession safe from outrage of any kind in whatever part of the world he may find himself. The old life of the seamen on sailing vessels has gone forever. The law now exists for the ship's boy as well as for the commodore.

AUSTRALIAN NAVY'S NEW COMMANDER.

COMMODORE ADDISON ARRIVES.

C O M M O D O R E
A. P. Addison,
C.M.G., who
arrived in Sydney
recently to take com-
mand of the Royal
Australian Navy, has
had a long and suc-
cessful career in the
British Navy.

From almost the
very outset of his as-
sociation with the
navy Commodore
Addison specialised
in the study of the
submarine, and in
1903 joined that
branch of the service.
As might be expec-
ted, he has had many
narrow escapes, for
submarine work in
those days was a
risky undertaking,
by reason of the
crude craft in which
the trials had to be
conducted.

At the outbreak of
war Commodore Ad-
dison was at the Ar-
miralty for a short
time, but later took
up duty in the North
Sea. Subsequently
he was attached to
the Italian naval sec-
tion at Brindisi, in
company with other
British cruisers, and
during one encoun-
ter with Austrian
ships his vessel was
badly torpedoed, and
had great difficulty
in returning to port.



Commodore Addison, C.M.G.

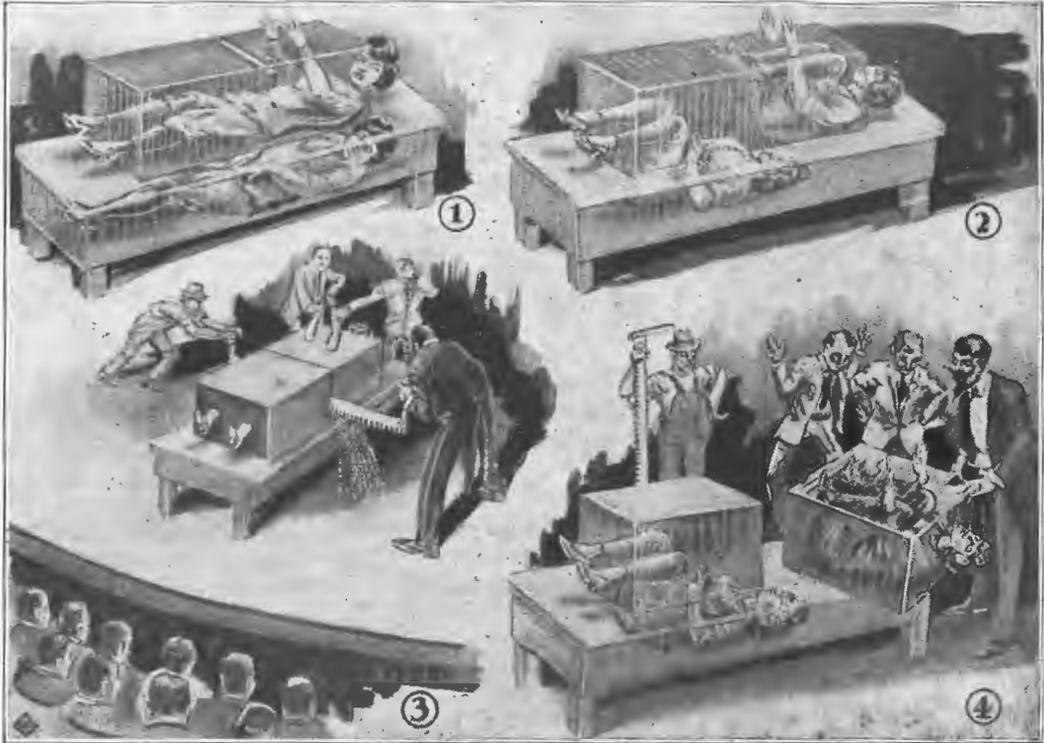
Later in the war
the Commodore took
over the submarine
forces at Harwich,
and in that great day
of reckoning received
all the German sub-
marines which had
survived the vigilance
of the British Navy—
some 158 — as they
came to heel.

Like most men of
his calling, Commo-
dore Addison is ex-
ceedingly modest,
and his customary
reply to the query as
to how he gained the
numerous distinctions
which are attached to
his name is that "the
story is too long to
tell." Amongst the
decorations which he
possesses are two
Royal Humane So-
ciety Life - saving
awards, C.M.G.,
Legion of Honour,
Rising Sun (Japan),
Order of Savoy
and Croix de
Guerre. The present
is Commodore Addi-
son's first visit to
Australia, where he
will serve two years
in command of the
R.A.N. Boating,
swimming and golf
are his favourite re-
creations, and he will
find sunny Australia
an ideal place in
which to indulge in
these popular sports.

SAWING A PERSON IN HALF

A MYSTIFYING TRICK THAT IS NOT SO MAGICAL
AS IT APPEARS

By A. HAZELTON RICE, Jnr.



One of the most mysterious acts which can be produced either for semi-professional or amateur theatricals is the trick here illustrated — of sawing a person in half. As the illustrations indicate, two young women are necessary in producing this illusion, and the large table used must have a hollow top of sufficient depth to accommodate one of them. The illustrations, together with the detailed description given in the article below, will render perfectly clear the successive phases of this magic act.

THE cold-blooded dismembering of a young lady for no other purpose than the delectation of an audience of amusement seekers, can be easily imagined as occurring in the arenas of ancient Rome, but it is well nigh impossible to describe one's impressions upon witnessing such a feat on the modern vaudeville stage.

The surgeon extraordinaire appears before the curtain is raised, explaining that he is about to saw his lady assistant completely in two and that the operation, while

a very delicate one, is performed absolutely without pain. He adds that she will be promptly restored to her normal condition, after the operation.

After thus enlightening his audience, the arch-vivisectionist turns to the rising curtain and greets the victim, a charming little lady, who instantly makes you resent assault upon her anatomy as is contemplated.

The performer calls for assistants from the audience and after selecting two and

seating them upon the stage he turns to the victim, suddenly holding before her eyes a small crystal ball. And now a secret! The effect of this act is much greater on the audience than upon the subject. I do not mean that the entire audience is hypnotized, but for some unknown reason hypnotism and magic seem to have linked themselves inseparably, and it is, therefore, entirely befitting that she should be placed in a comatose condition before proceeding further. Having been thoroughly satisfied that the subject is under the hypnotic spell, the audience is willing to believe almost anything possible. In other words, a mystic atmosphere is created.

The victim is then laid upon a table; two straps are lowered from the flies or above-stage, and after being securely fastened, she is raised a few feet in the air to make room for the cabinet into which she is to be placed.

The victim is lowered into the cabinet, which is a bit short, her head and arms protruding from one end and her feet from the other. The two ends of the cabinet are placed in position, these latter having semicircular openings for the neck, hands and feet. The cabinet and table are then swung around a quarter turn so that the cover may be closed and locked in full view of the audience and its committee of two. This accomplished, the cabinet and table are swung back into their original position. One of the committee is assigned to the holding of a dainty pair of ankles at the foot of the cabinet and the less fortunate one *vice versa*.

The saw, about the capabilities of which there can be no doubt, is brought upon the stage and examined, and then, amidst goose flesh music by the orchestra, the cabinet, and incidentally its occupant, are cleanly severed while the audience holds its breath and shudders.

A slide is then placed in each section of the cabinet, thus mercifully sparing the audience from an inspection of the debris, and the two sections are pulled apart in order that the performer may walk between them and show that there is no deception. Two window curtains of the proper size may be used to close the cabinet compartment, operating them by strings, etc. Upon placing the sections of the cabinet together again and unlocking the cover, the young lady, much to the relief

of the audience arises none the worse for her experience.

The inventor of this illusion, as are all followers of magic, is a true disciple of Barnum, and of his doctrine that the public likes to be fooled, and in this he has certainly succeeded.

It is not the author's purpose to write an exposé of the act as presented, but merely to point out how such an effect could be accomplished.

First, it may be stated that two female assistants, instead of one as supposed, would be required, and while they need not look alike it would be highly essential that the limbs of each be carefully selected for similarity. An examination of the accompanying sketches should make the reason clear.

Victim number one comes upon the stage and is placed in the cabinet, hands, head and feet remaining in full view of the audience. The ends are placed in position and the cabinet given a quarter turn so that the feet face the rear of the stage. Ostensibly this is for the purpose of lowering the cover and locking it, but as soon as the cover is lowered victim number one withdraws her feet and doubles her body into as small a compass as possible, while victim number two, the silent partner, who has been reclining comfortably within the table all this time, substitutes her ankles for those of victim number one. It will thus be seen that the cabinet, which by the way may be made of heavy cardboard and decorated with an appropriate design, is free to be cut into two equal sections with no danger to its occupant or rather occupants.

After the cabinet is sawed in two the sections, and apparently the victim as well, may be separated by sliding the part which contains the trunk and head. It is well to remind the prospective magician, however, that the slides referred to above must be first placed in position and also that any attempt to slide the lower section on the table would result in the more or less sudden disappearance of milady's ankles within the cabinet.

The victim can be "reassembled" by a reversal of the moves already described.

The illusion (concludes the writer in *Science and Invention*) is an innovation in the realms of magic and the effect upon the audience is all that could be desired by the most fastidious wizard of the wand.

TAPPING A RUBBER TREE.

ART IN WHICH JAVANESE WOMEN EXCEL.

WORK ON A SUMATRA PLANTATION.

Tapping a rubber tree is an art that requires a delicate touch and sure hand. Contrary to general opinion, rubber is not the sap of the rubber tree, but is a fluid called "latex," found between the corky outer bark and the hard, thin inner tissue that incases the wood.

By tapping is meant the cutting of the tree so that its latex will exude and be caught in a cup properly placed. The amount of latex secured and the welfare of the tree depend upon proper tapping.

One of the best methods of tapping has been found to be a diagonal cut extending a third of the way around the tree. These cuts are made with a razor-like knife of special construction, whose blade is so thin that twenty tapings may be made side by side in an inch of bark. If the cut is not sufficiently deep a full quota of latex is not obtained, and if the cut is too deep the tree is injured and its tender exposed parts are susceptible to disease infection. If too wide a cut is made valuable bark is wasted. Tapping is, therefore, an important work, and the labourer entrusted with it announces himself as a tapper with some pride.

The latex does not flow through the tree like sap, but is found in cells. Tapping

in most localities may be done daily, but not to such an extent that the vitality of the tree will be weakened. Trees that have been over-tapped for a time show response to a few days of rest.



Showing One of the Many Systems Used in Tapping Rubber Trees.

On the great plantation of the United States Rubber Company in Sumatra — so vast in extent that close to 20,000 persons are engaged in working it — it has been found that Javanese women are among the best tappers. Chinese labourers are numerous in that section of the country, and many find employment on the plantation, but as a rule find it difficult to perform the delicate tapping operation. Javanese men are more suited to tapping work than the Chinese, but the Javanese women are generally considered the best

of all. It is in the heavy work of clearing the jungle for planting that the Chinese are most at home. This work is usually done by contractors, who employ Chinese to a large extent. The trees and undergrowth are usually cut down in the wet season, the *débris* being piled up ready for burning when the dry season sets in. Taking out the stumps and digging drainage ditches are counted as part of the clearing operation.

When the ground has been cleared the surface is worked over a number of times with a tool called a "chankol," shaped much like an adze. Then the trees are planted in rows, usually in the form of small seedlings, from 100 to 200 being planted to the acre.

To keep down the weeds is one of the great problems on the plantation. In the moist, tropical regions weeds grow at a pace that would discourage a New England gardener. The customary method of combating the weeds is to chankol the entire plantation once a month. In so large a plantation as that of the United States Rubber Company, with its seventy square miles of trees this is a heavy expense item. Some successful experiments have been tried with mimosa, a ground creeper that covers the surface with a thick mat and chokes out the weeds.

To combat the natural disinclination of the natives of the tropics to perform manual labour, practically all work on the plantation is "task work." Each worker starts off each morning with a certain amount of work to be done, and as soon as he has finished he is through for the day. A chankoler is given so many yards of surface to cover, the tapper is assigned a certain number of trees—everything is on the stint basis.

This method of allotting work has proved very satisfactory. Most of the workers are anxious to get through the day as soon as possible, and there is an air of hustle in the early morning hours. All the labourers are in the field as a rule by five-thirty or six o'clock, and by eleven-thirty the heaviest part of their work is done. Because of the tropical conditions that prevail a regulation of the Dutch Government in Sumatra requires that an hour's rest be granted the workmen after six hours' work.

The tappers are through with their tapping work by noon time. The tapper's "task" is usually 450 trees. By 8 o'clock or 8.30 these trees have all been tapped, and the work of collecting the latex from the cups begins. Metal milk cans are used, and when this work is finished each worker takes his cans to the collecting sheds and the latex is weighed. That ends the morning's work. In the afternoon there are smaller jobs to be attended to, such as weeding, cleaning utensils, and sharpening

knives. By 4 o'clock in the afternoon even the slowest workers have completed their tasks.

The labourers follow the custom of the region in eating but two meals a day. Before starting work, or between jobs in the early morning, they will grab a hasty snack. The first real meal of the day comes during the rest period following the tapping work. The heavy meal is taken at night. The principal articles of food are rice, fresh and dried fish, and bananas.

The language spoken is Malay. No matter what the native tongue of a worker may be, he is able to understand Malay also; for everything pertaining to his work is carried on in that language. Among themselves the Javanese usually speak their own tongue. This is also true of the Chinese, and often the latter are slow in learning Malay.

Americans and Europeans going to the plantations acquire a working knowledge of the Malay tongue as soon as they can. Once able to make themselves understood in Malay, they find themselves equipped to get about easily among the natives. It is a simple matter to learn enough in a few months to answer the usual requirements.

To come back to the rubber tree itself, it is worthy of note that in the past decade, with its tremendous demand for crude rubber, notable progress has been made in finding out the secrets of rubber tree cultivation. By intensive study many interesting and commercially important things have been learned about planting, tapping, grafting and similar subjects.

Every one of the 5,000,000 trees on the plantation is under constant inspection. If one tree gives a greater yield than another a study is made of the causes. Moreover, by a process of selection the yielding power of the trees is being gradually increased, the best yielding trees being used for the propagation of new trees.

The trees yield an average of from one-third to one-half an ounce of latex each day. Half of this weight is rubber, making the annual yield of real rubber from each tree three to four pounds.

One of the first requisites to successful manufacture of rubber is that the crude rubber shall be uniform in quality. One of the big obstacles manufacturers in the United States have had to meet has been

the lack of uniformity in the crude rubber they buy in the open market.

To illustrate how easy a matter it is to have a wide variance in the quality of the rubber, one need look no further than to the effect of a rainy day on a plantation. With rain drops running down the trees it is only natural that the latex should be more or less diluted with water. When chemicals are added to the latex to solidify it, if account is not taken of the extra water content, a much different grade of

crude rubber will be produced than on a day when there is no rain.

One of the reasons the company mentioned gives for the uniform quality of its tyres is that it produces its own rubber and gives especial attention to uniformity. Every step in the process of plantation operation from the minute the jungle is cleared until the rubber is in the final manufactured form is guided with a view to the ultimate use of the crude rubber in manufacturing high-grade goods.

BOOK REVIEWS.

My Electrical Workshop,

By Joseph H. Elgie; illustrated, cloth covers, size 5 x 7½ inches, 251 pages.

This work is one which we can certainly recommend to our readers, and a boy who will go through it, chapter by chapter, constructing the apparatus as described, will get some very fine classical work in electricity. If he follows the directions, so as to produce nicely made and finished apparatus, his experience in the handling of metals will be of lasting advantage to him. Each chapter is preceded by a list of the materials required to construct the apparatus described in it; a great many illustrations are given, and while it is largely a practical treatise, theory is not neglected, and the reader will pick up a great deal of the theory of electricity from its pages. There are one hundred and fifty illustrations. Our copy from The Wireless Press, Sydney.

* * *

Weather Book for the General Reader,

By Frank T. Addyman; 249 pages, fully illustrated; cloth covers, 5½ x 8½ inches.

From The Wireless Press of Sydney comes this book on meteorology. It is fair to say that its subject is thoroughly covered in the fifteen chapters.

It is interesting to notice that three chapters towards the end are devoted to supposed weather signs. Some of us feel that, by observation of the sunset and general signs, we can beat the Weather Bureau at prophesying. For such people undoubtedly these three pages will be valuable reading.

One trouble of course with the supposed weather signs, is that what may be the sign of one kind of weather in a certain locality, will indicate another kind in some other section—especially if we take into consideration the prevalent winds, but these three chapters are certainly interesting and instructive.

The book is illustrated and the picture of the "Thames" in olden times frozen over is really quite interesting to the person who knows his London. This picture shows a "Frost Fair" of old times, and is the reproduction of an old print. A weather vocabulary follows the text and an excellent index is appended.

"SHIPPING AND COMMERCE OF AUSTRALIA."

From the publishers, Shipping Newspapers, Limited, comes a splendidly printed and profusely illustrated volume, under the above title, containing an up-to-date record of Australia's advancement in the fields of Shipping and Commerce.

The publication is both valuable and opportune, since the time is more pressing than ever for the encouragement of Australian industries, and there is no better way of arousing public interest in the matter than by letting the world know what Australia has already done, and is doing.

"Shipping and Commerce" will do much towards this end, and the publishers are, therefore, entitled to a meed of praise.



"Easterner" in a Typhoon.

THE steamer *Easterner* entered Sydney Heads recently bearing visible evidence of the violence of a typhoon encountered on the run to Auckland from Panama. In the words of her master, Captain O'Brien, the gale was "simply hell." For four days the hurricane raged and huge waves broke over the vessel continuously. So desperate did the situation become that the *Easterner* was hove-to, in which position every portion of her was flooded, and the third mate's bunk on the port side was doubled up and his cabin furniture smashed. Portion of the bridge was also carried away.

During the four days the storm raged Captain O'Brien remained continuously at his post, and was unable to secure even a wink of sleep. Officers and men paid the highest possible tribute to his seamanship, and declared that his skill and devotion to duty were mainly responsible for bringing the vessel safely through.

More Vessels Launched.

Recent advices from England contain news of the launching of two new steamers for the Australian trade, the *Port Campbell* and the *Port Hunter*, both for the Cunard Line. These vessels will shortly be added to the fleet of "Port" steamers coming to Australia.

The *Port Hunter* was launched on March 14 at the yards of Hawthorne, Leslie & Co., Ltd., Newcastle-on-Tyne, and the *Port Campbell* came from the slips of Workman, Clark & Co., Ltd., at Belfast, on March 15. The *Port Campbell* is a vessel of about 8,550 tons gross register, and is designed for a deadweight carrying capacity of 11,600 tons. Built with a

straight stem and a cruiser stern, the vessel is 500 feet in length, with 62ft. 3in beam, and moulded depth of 35ft. 8in. The vessels are equipped with five large holds for handling large, bulky cargo, such as machinery. Amidships provision has been made for the carriage of a limited number of first-class passengers.

Oil Fuel for Ships.

Good progress is being made at Port Melbourne and Altona with the Anglo-Persian Oil Company's scheme for supplying ships with oil fuel in place of coal, and for placing lubricating and other oils on the local market. The laying of the pipes at the Prince's pier is now completed, and pipes are also being laid in the direction of the new deep water pier which is to be erected by the Harbour Trust nearer the railway station. In all eight tanks, each with a capacity of ten thousand tons, will be erected and the first one is already in position, and will receive its consignment of oil from a tank steamer now on the way to Melbourne from Persia.

It is anticipated that at an early date the Orient, P. & O., British-India, A.U.S.N., Union S.S. Co., and other lines associated with the Inchcape group will convert their vessels into oil-burners. The new Commonwealth liners also burn oil fuel, but up to the present they have had to take in oil supplies at Fremantle, the only distributing station now in use in Australia. The refinery which is being erected at Altona will be used for manufacturing and distributing lubricating oil.

"Medic" Returns to Australian Trade.

The White Star liner *Medic*, which performed such excellent service as a trans-

port during the late war, has been reconditioned and renovated, and reached Australia last month on her first voyage since her return to the trade. Few travellers would recognise her interior, so great are the changes that have been made.

The passenger-carrying capacity has been reduced by about one hundred berths, but the space thus saved has been utilised in adding to the comfort and convenience of the remainder of her accommodation. Cabins and saloons have been greatly enlarged, and the dining saloon is now capable of seating all the passengers at one sitting.

The vessel encountered tempestuous weather, after leaving Albany, but in keeping with her reputation behaved splendidly.

* * *

New Australian Liner.

The steamer *Barrabool*, a large twin-screw passenger vessel of 13,300 tons, which has been built by Harland & Wolff, Ltd., Belfast, to the order of the Peninsular & Oriental Steam Navigation Company for their Branch Line service, carried out satisfactory trials before leaving London for Australia. Classed 100 A1 at Lloyd's, she is 537ft. long by 64ft. broad by 41ft. deep. Accommodation has been provided on a very complete scale for about five hundred cabin passengers, and, in addition, provision can be made for nearly one thousand third-class passengers on the main deck. There are nine bulkheads dividing the vessel into ten watertight compartments, and the double bottom is subdivided for water ballast or fresh water; the fore and aft peaks being reserved for water ballast. The main entrances are of a spacious character, with a mahogany stairway and balusters and corrugated rubber treads. The dining saloon is a large apartment, and is arranged to permit the full complement of passengers to dine at the same time. The framing is simple but pleasing, having a teak and pitch pine dado with panelling above painted white. Every care has been taken to secure good ventilation, and steam heating has been arranged all round the sides and ends of the saloon. The music-room walls are tastefully panelled and finished white with a hardwood dado. This apartment is situated on the shade deck. The smokeroom, which is on the boat deck aft, is panelled and painted in white, with a

hardwood dado, and is a most comfortably arranged apartment. The staterooms are in deck-houses on the shade deck, and also on the upper deck, and are arranged on the well-known tandem principle, which ensures natural light and ventilation. The *Barrabool*, which is the third vessel of this type delivered to the P. & O. during the last few months by Harland & Wolff, will shortly be followed by her two sister-ships, the *Balranald* and the *Bendigo*, and she should prove a most useful addition to the company's imposing Australian fleet.

* * *

Barque "Manurewa" Missing.

At date of writing the fate of the barque *Manurewa*, which left Sydney on March 31, bound for the Clarence River, a voyage of only two hundred and ninety-six miles, is still shrouded in mystery.

The *Manurewa* is an iron vessel of three hundred and twenty-seven tons, owned by A. S. Paterson Ltd. and R. G. Holmes, and was under the agency of R. S. Lamb & Co., of Sydney. She carried one hundred tons of coal ballast to Grafton, where a cargo of hardwood was to be loaded for New Zealand. Beyond a wireless message received shortly after the vessel cleared Sydney Heads, no further news has come from her, and grave fears were entertained for her safety when she failed to reach her destination at the end of eight or ten days. Subsequently a report was received from the lighthouse-keeper at Camden Haven, one hundred and fifty-nine miles from Sydney, that the *Manurewa* had been sighted off that point on April 9. Thus it had taken her nine days to cover that distance. Despite the fact that wireless calls were broadcasted over the ocean shortly after the barque's whereabouts began to occasion anxiety, no messages were received from her in return. This can be accounted for by either the wireless aerials having been blown away or the engine used in generating the electricity refusing to work. This is, of course, leaving out the fact that disaster may have overtaken the vessel after she was sighted at Camden Haven, which, as the days go by and no further news is received, is being regarded as highly probable. The State Navigation Department ordered a bright lookout to be kept for the missing vessel by all pilots and masters of vessels along the coast, and the captain of the

Kinchela, trading between Sydney and the Macleay River, subsequently reported that a barque resembling the *Manurewa* was sighted on April 28.

Captain R. G. Holmes, part owner and master of the *Manurewa*, is well known in shipping circles, and those acquainted with him speak highly of his skill as a navigator. For this reason shipping men are unwilling to give up hope of the barque's ultimate reappearance. The crew, exclusive of the master, numbered thirteen, and included several Sydney men and boys. The oldest member was seventy and the youngest sixteen.

* * *

Wreck of the "Phil Forbes."

The ketch *Phil Forbes*, owned by Messrs. Forbes Bros., foundered near Two Fathom Rock, about three miles north of Broughton Island recently. The ketch left Newcastle with a cargo of one hundred tons of coal for the Manning River. About dusk the same evening her crew had to abandon her in a hurry. They took to the boat and watched the ketch settle down in about fourteen fathoms of water. On reaching the island they found it uninhabited, but managed to secure a small quantity of food by breaking into one of the huts. On the following Sunday a number of Greek fishermen visited the island and towed the crew of the ill-fated ketch into Nelson's Bay in their own boat. In spite of the trying time they experienced, Captain Muir and his companions looked little the worse when they reached Sydney.

* * *

Ship's Strange History.

It has been decided to convert the three-masted barque *Shandon*, now lying at Port Melbourne, into a coal hulk. Some time ago it was proposed to convert the barque into a modern coal-handling machine, but the outlay of £100,000 necessary to do this was evidently considered excessive, combined with the fact that no very definite results are yet known about the working of a similar machine in New Zealand.

The *Shandon*, which has been lying idle at Port Melbourne since being bought by the Bellambi Coal Co. from the Commonwealth Government Line about twelve months ago, has had a chequered career. She was originally a British sailing-ship and was subsequently sold to a Norwegian

firm of shipowners. The ship was in port at Melbourne when war broke out, and as no cargo was available for her she was sold to J. Paterson & Co., coal merchants.

During the war, when tonnage became scarce, the vessel was bought by the Commonwealth Government Line for £7,000, and converted into her present rig at an additional cost of about £14,000. For a time she earned high freight and soon paid for herself.

After peace was declared a great shipping depression came about, and the *Shandon* was sold for £4,000, or less than one-fifth of her original cost. At the time of the sale it was stated that the vessel was equipped with three sets of sails, which were alone worth the purchase money.

The *Shandon* is said to have one of the soundest and strongest hulls of any sailing-ship seen in Melbourne for years.

* * *

Wreckage on the North Coast.

The fierce southerly gale which swept along the New South Wales coast about the middle of May was responsible for an exciting time for shipping generally. Fortunately no mishaps have been reported, but in some instances delays of several days in making port have been recorded.

On the North Coast a quantity of wreckage consisting of two hatches and a kapok lifebelt were washed ashore at Seal Rocks.

The Federal Deputy-Director of Navigation (Captain Williams) was advised to the above effect by the head lighthouse-keeper at Seal Rocks.

One hatch was marked "No. 6," in red and white figures, and carried a 7in. diagonal white band. The other was marked "No. 2," in white, and had an 8in. vertical red band. No marine growth was observed on either hatch.

The life-jacket, which was apparently new, was made by Brett, Balmain, and was covered with a slight marine growth.

When this information was referred to Messrs. R. S. Lamb & Co., agents for the barque *Manurewa*, they stated that there was nothing to indicate that the wreckage came from the missing vessel. The *Manurewa*, however, carried several lifejackets made by Brett, Balmain.

An official of the Navigation Department stated that in his opinion the hatches washed up did not belong to the *Manurewa*, being too large.



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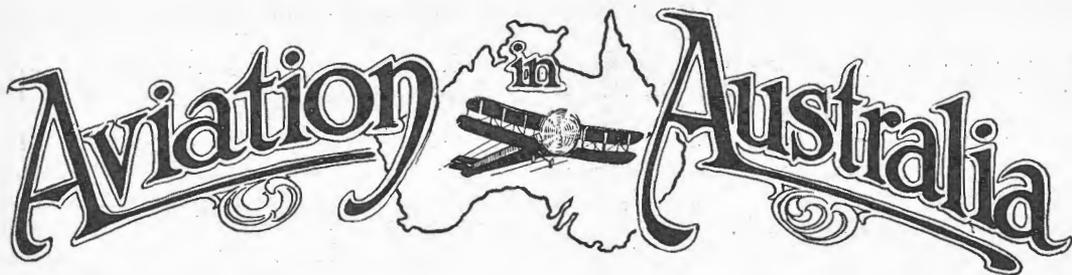
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Aviation in Australia

Flight to Grafton.

LIEUT.-COL. BRINSMEAD, controller of civil aviation, recently flew from Sydney to Grafton in four hours. From there he continued his flight north for the purpose of exploring the landing grounds on the Sydney-Brisbane air mail route. From Brisbane he paid a visit of inspection to the Charleville-Cloncurry mail service, which is now in full swing and operating smoothly.

Col. Brinsmead was asked at Grafton if there were any likelihood of that town being omitted as a landing place in the Adelaide-Brisbane air mail service. His reply was that the service would not be complete if Grafton were omitted.

There is no better way of encouraging the growth of popular interest in aviation than by bringing people into close touch with the operations of the various services. In a big inter-State service such as will soon be operating, it is, of course, not expedient for many reasons, to have landing grounds at frequent intervals. Emergency landing grounds are obviously necessary as a measure of safety, and the Adelaide-Brisbane route will be well provided in this respect, but stopping places at which passengers and mails will be unloaded and embarked must necessarily be limited. Consequently the towns that have been selected for this purpose are pardonably jealous of the honour which has been conferred upon them, and any attempt to rob them of the promised distinction would be very warmly resented. However, the promoters of the enterprise have no intention of doing anything that will not meet with public approval, for they recognise that the measure of support accorded them depends to a very great extent on the creation of a friendly public interest.

Aviators' Obelisk.

A handsome bluestone obelisk, 16 feet high is to be erected at Darwin to commemorate the successful landing there of the late Sir Ross Smith and party after their memorable flight from England to Australia.

Plans prepared by the Department of Works and Railways have been ready for some time, but the erection of the obelisk awaits the consideration of an item in the 1922-23 estimates. A sum of £600 was originally provided for the work, but as the lowest tender for the work was close on £700, approval for the increased amount has now to be obtained.

The obelisk will bear on its base the names of the aviators and a suitable inscription. It is proposed to erect it as near as possible to the location of the landing at Fanny's Bay, without affecting the suitability of the site for a permanent landing ground. A flat stone placed flush with the ground will mark the actual spot at which the *Vickers-Vimy* came to rest.

Why People are Pessimistic.

There can be no question that quite a number of people cherish very pessimistic feelings about the safety of flying. This can be accounted for in several ways. Some are born pessimists, and refuse to allow the light of reason and performance to dispel the conservatism in which they are hopelessly enwrapped. Enlightenment may come to this type of individual some day, but in the meantime it is gratifying to know that their number is so small, and their outlook so obviously narrow that they fail to impress anybody. Another reason for pessimism is that the kind of aviation to which Australians have been treated in the past has not been calculated to inspire confidence compared with the new

era upon which we are about to enter. The trouble has been that in the past pilots have been flying over unorganised and unprepared routes, and, until legislation put a stop to it, inexperienced pilots provided with unsuitable machines, were able to follow their calling to the consequent detriment of aviation, not to mention loss of life.

This matter was recently touched on by Lieut. Briggs, who will be one of the pilots on the Sydney-Adelaide service. "Accidents due to the causes already mentioned will be entirely eliminated on this service," said Lieut. Briggs, "because the Government are making landing-grounds every 12 miles in bad country, and in other places at such distances apart as the nature of the country warranted. A pilot flying at a good altitude could, in the case of engine trouble when midway between two landing-places, easily glide to one or the other. If he were flying at an altitude of 6,000 feet he could glide, with his engine shut off, a mile for every thousand feet; and if at 8,000 feet he would have a good deal to spare. On a commercial trip a pilot would not cross the Adelaide hills, for instance, at less than 6,000 feet, and would always be sure to have a margin of safety. Until July of last year there was no legislation for the control of civil aviation in Australia, and any person, whether a qualified pilot or not, could take an aeroplane and passengers up. Further, the machines could be in anything but an airworthy condition. Under the new law, pilots had to pass a strict medical and technical examination, and machines were subject to official supervision." Lieutenant Briggs is satisfied that aeroplanes have come to stay. Aviators know all the peculiarities of air currents, etc., he says, and the passenger machines are stable and particularly easy to control. The perfecting of wireless telephony has, in his opinion, helped to make air travelling as safe as sea travelling. In each case the human element comes in. The careless or unskilful mariner may wreck his ship, and the careless or unskilful aviator may crash. Lieutenant Briggs was engaged in the London-Paris service, carrying delegates to the Peace Conference. That service attained 95 per cent. proficiency—that

is to say, only 5 per cent. of flights had to be abandoned owing to impossible weather conditions.

Practical Work in Queensland.

At a recent meeting of the Queensland branch of the Australian Aero Club, held for the purpose of considering ways and means of establishing an air ambulance in the sparsely populated areas of Western Queensland, the chairman, Mr. J. J. Knight, spoke of the practical work done by the Queensland branch in the interests of aviation. They "owned no 'planes, and had no social achievements to their credit," said Mr. Knight, "but the full value of what they had done would be manifest in a few years."

For instance, reserves had been marked out as suitable landing grounds right along the coast, and if the Commonwealth defence authorities had taken the precautions to furnish landing grounds there would have been fewer fatalities.

Proof that Mr. Knight's claims constituted no idle boast is furnished by the earnest manner in which the Club is tackling the question of establishing an aerial ambulance. It is estimated that at least £5,000 will be required to institute the service, and maintain it for 12 months, and the cost of maintenance for each succeeding year will work out at about £3,000.

Round the World Flight.

Australians will always have the keenest interest in any future attempts made to carry out a round-the-world flight by reason of their star airman, the late Sir Ross Smith, having met his untimely death on the eve of attempting the great project.

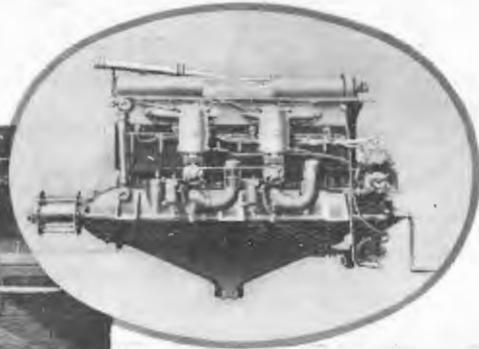
The latest to announce his intention of attempting the flight is Major W. T. Blake, of the Royal Air Force, who will have as his companion Captain Norman MacMillan. The aviators will use an amphibian machine, and propose to start at an early date.

It is proposed to follow the route mapped out by Sir Ross Smith, except the Atlantic stretch, which will be crossed from America, via Greenland, Iceland, and Scotland. The Napier Company has

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offered the loan of three engines—one to be fitted at the start, a second to be picked up in Japan, and the third in Canada.

The aviators are now awaiting the sanction of the Air Ministry for the release of a special type of machine, but if it is not sanctioned they can obtain another suitable for the purpose immediately.

It is expected that the trip will take about two months. The machine will be fitted with wireless, and will have sufficient tankage to cover a range of 1,500 miles, which is nearly double the longest sea flight. It will also carry a cinematograph camera, as the syndicate which is helping to finance it is determined that the flight shall pay its way.

Sir Ross Smith's Successor.

Major W.T. Blake is 31 years of age. He is married and has two children. During the war he served on various battle fronts, including (as Air Intelligence Officer) the Middle East. He was largely concerned in the organisation of the Egypt to India and Cairo to Cape Town air routes, and has since acted as aviation correspondent for the "Daily News." Last summer he flew to Russia to investigate famine conditions. He proposes to start on his new undertaking from the Thames, outside the Houses of Parliament. If all goes well he hopes to return to England in August or September. He chose the route mentioned because the longest sea passage is 800 miles, and he will have sufficient tankage to cover 1,500 miles.

WORLD'S RECORD FOR SUSTAINED FLIGHT.

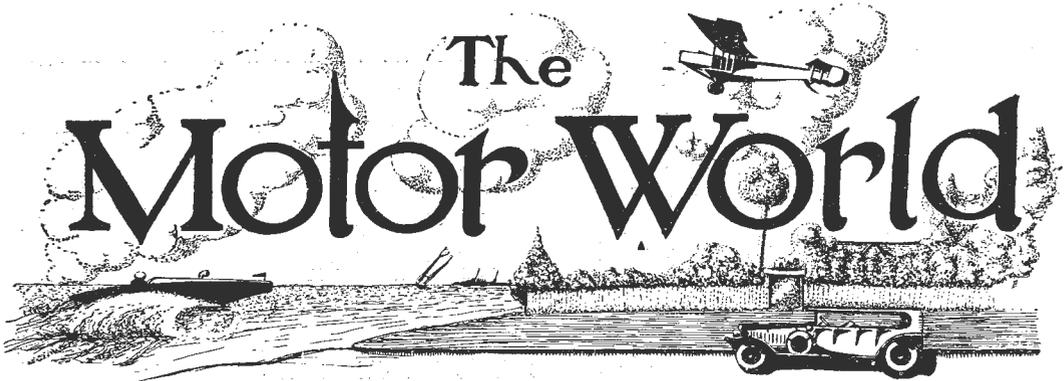


Eddie Stinson (left) and Lloyd Bertaud recently established a new record for continuous flying by staying in the air for twenty-six hours, nineteen minutes and thirty-five seconds. During that time they travelled two thousand and two hundred miles. The flight was made in a blinding snowstorm and in below zero weather.

PRESS DIRECTORY.

The Australian and New Zealand Press Directory for 1922 issued by the Country Press Co-operative Co., of Australia Ltd., will be warmly welcomed in commercial circles for the wealth of useful information which it contains. Business competition is so keen nowadays

that a work of reference, such as that under review, is a decided time saver, in addition to being of immense value in enabling business men to place their appeals where the most fruitful fields lie. Our copy from the publishers, 178 Castle-reagh Street, Sydney.



By "SPARKING PLUG"

Motor 'Bus Enterprise.

NEWCASTLE City Council is considering a scheme for the municipalisation of a motor bus service at an estimated cost of £250,000. If agreed to, the service will obviate the necessity of electrifying the steam tramway system—a project which the Railway Commissioners estimated would cost £1,000,000.

The proposal before the Newcastle Council serves to emphasise the possibilities, from a speculative standpoint, of motor 'bus enterprise.

Many isolated cases of individual enterprise in transshipping the travelling public are daily evidenced by the increasing fleet of motor 'buses, which seem to jostle each other on their way through the main arteries of the eastern and western suburbs of Sydney.

But there is an utter lack of system and co-ordination characterising the existing services, which must make for more cost than otherwise should be the case.

To get down to bedrock, the present time is over-ripe for the advent of a Motor 'Bus Company Limited, to be formed on lines similar to the Sydney Ferries, with the object of acquiring the whole of the motor 'buses plying through Sydney streets.

A lengthy lease from the Government would, of course, be essential to ensure immunity from the enemies of private enterprise, but with a Government partial to private enterprise in power, such a lease should be readily forthcoming, especially as the ultimate effect would be to relieve the congestion of the city's inadequate tramway system.

At the present time it is a common sight

to see motor 'buses racing each other for the next stopping-place with the one ambition to pick up wayside passengers who could easily be catered for by one vehicle.

At Oxford Street, Darlinghurst, 'buses from Bondi, Bronte, Edgecliffe, Bondi Junction, Five Ways, Pott's Point, and the top of William Street frequently meet and, thence commences a bustle for the railway station.

Under one management all eastern suburbs 'buses could terminate their journeys at Darlinghurst, with a special service of 'buses plying continually between Oxford Street and the Railway to pick up the passengers set down at Darlinghurst. This would spare the spectacle of a number of half-empty vehicles expending time, wear and tear, in needless visits to the Station, and would also ensure profitable loads for the regular service between Darlinghurst and the Railway.

The other advantages arising from a unified control of Sydney's motor services are obvious to all. It spells money, and with efficient handling, should prove profitable to any business or financial men ready to sponsor it.

Failing the Government granting an extended lease to the promoters of such a company, the former should be prepared itself to take some steps towards regulating the various existing services, with a view to cutting out unnecessary duplication and overlapping, thus enabling owners to reduce the cost of maintenance and, incidentally, the fares of passengers.

Petrol Tests at Kurrajong.

Favourable weather conditions greeted the reliability touring contest to Kurrajong Heights, under the auspices of the Royal

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Automobile Club on Saturday, May 13.

The run is generally recognised as the pick of one-day tours around Sydney, the route followed being along Parramatta Road, Baulkham Hills, Rouse Hill, Windsor, Richmond, North Richmond, Grose Vale Road turn off, and Kurrajong Heights.

The test was arranged for two classes—one for members not interested in the sale of motor vehicles, and one for members connected with the trade. The cars were equipped in ordinary touring condition, with standard mudguards, hoods, and windcreens. Points were allotted and deductions made as follows:—Reliability 200, petrol consumption and hill climb 100 points. Each car was fully loaded with passengers. The trial was one of reliability, not speed. Eight cars competed in the private class, and six in the open section.

A single-seater 8.37 h.p. *Belsize*, driven by A. W. Fairfax, put up the best petrol performance, doing 45 miles to the gallon.

The members controlling the contest were: Messrs. W. E. Arnott, G. F. Hill, D. M. Cooper, R. V. Hodgson, H. T. Nock, and H. Kerr.

Results:—

Petrol Consumption.

Private Class.

W. Stuart (<i>Essex</i>), weight 4340lb., miles per gallon 38.70, formula points 11366, allotted points 100 ..	1
S. C. Ottoway (<i>Vauxhall</i>), 4424, 34.66, 10311, 90.69 points ..	2
W. J. Stuart (<i>Hudson</i>), 5166, 30.81 10185, 89.58 points ..	3
A. G. Barnard (<i>Fiat</i>), 2772, 39.16, 8760, 77.04 points ..	4
G. R. Martin (<i>Essex</i>), 3878, 23.11 6311, 55.51 points ..	5
W. M. Walker (<i>Vauxhall</i>), 3976, 19.35, 5369, 47.22 points ..	6
W. E. Arnott (<i>Hudson</i>), 4879, 16.64, 5288, 46.51 points ..	7
J. A. S. Jones (<i>Cleveland</i>), 3402, 20.8, 5239, 46.08 points ..	8

Open Class.

Boyd Edkins (<i>Vauxhall</i>), 4319, 34.66, 10148, 100 points ..	1
Alick McNeil (<i>Fiat</i>), 2758, 42.66, 9517, 93.76 points ..	2
J. M. Hanlon (<i>Fiat</i>), 2744, 41.60, 9256, 91.19 points ..	3
A. W. Fairfax (<i>Belsize</i>), 2044, 44.98, 8600, 84.73 points ..	4

Hill Climb.

W. Stuart (18.98 h.p. <i>Essex</i>), weight 4340lb., time in seconds 215, formula points 10635, points allotted 100 ..	1
S. C. Ottoway (26.25 <i>Vauxhall</i>), 4424, 173 ³ / ₅ sec., 10314, 96.98 ..	2
W. J. Stuart (<i>Hudson</i>), 5166, 218 ¹ / ₅ sec., 8552, 80.41 ..	3
W. M. Walker, 29.15 (<i>Vauxhall</i>), 3976, 176 ⁴ / ₅ secs., 8419, 79.16 ..	4
A. G. Barnard (9.45 <i>Fiat</i>), 3772, 350 ² / ₅ secs., 8371, 78.71 ..	5
W. E. Arnott (<i>Hudson</i>), 4879, 255 ² / ₅ sec., 6826, 64.18 ..	6
J. A. S. Jones (20.25 <i>Cleveland</i>), 3402, 293 secs., 6163, 57.95 ..	7
G. R. Martin (18.98 <i>Essex</i>), 3878, 463 secs., 4413, 41.49 ..	8

Open Class.

Alick McNeil, (9.45 <i>Fiat</i>), 2758, 261 ² / ₅ secs., 11160, 100 ..	1
Boyd Edkins (20.16 <i>Vauxhall</i>), 4319, 199 ³ / ₅ secs., 10751, 96.33 ..	2
G. Gurney Grime (<i>Voisin</i>), 5460, 270 ¹ / ₅ secs., 9185, 82.30 ..	3
J. M. Hanlon (9.45 <i>Fiat</i>), 2744, 348 ¹ / ₅ 8339, 74.72 ..	4
A. W. Fairfax (<i>Belsize</i>), 2044, 380 ² / ₅ secs., 64.20, 57.53 ..	5

Final Results.

Private Class.

W. Stuart (<i>Essex</i>), 400 points ..	1
S. C. Ottoway, (<i>Vauxhall</i>), 387.67 points ..	2
W. J. Stuart (<i>Hudson</i>), 369.99 points ..	3
A. G. Barnard (<i>Fiat</i>), 355.75 points ..	4
W. M. Walker (<i>Vauxhall</i>), 326.38 points ..	5
W. E. Arnott (<i>Hudson</i>), 310.69 points ..	6
J. A. S. Jones (<i>Cleveland</i>), 304.03 points ..	7
G. R. Martin (<i>Essex</i>), 231 points ..	8

Open Class.

Boyd Edkins (<i>Vauxhall</i>), 396.33 points ..	1
Alick McNeil (<i>Fiat</i>), 393.76 points ..	2
J. M. Hanlon (<i>Fiat</i>), 363.91 points ..	3
A. W. Fairfax (<i>Belsize</i>), 340.26 points ..	4
C. Gurney Grime (<i>Voisin</i>), 338.98 points ..	5

* * *

The Royal Automobile Club's first contest to Kurrajong was decided in 1920, when Mr. W. J. Stuart secured first place in the private section with 383.46 points out of a possible of 400. Mr. J. Fielding

Exide

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VICTORIA: Sutherland & Ashman Pty., Ltd., Queen's Bridge (2 Maffra Street), Melbourne.

SOUTH AUSTRALIA: Unbehaun & Johnstone, Ltd., Rosina Street, Adelaide.

WEST AUSTRALIA: Unbehaun & Johnstone, Ltd., 404 Murray Street, Perth.

NEW ZEALAND: Hope, Gibbons, Ltd., Inglewood Place, Wellington.



was second with 382.23 points. Mr. Boyd Edkins won the open section, obtaining 396.5 points out of a possible of 400. Mr. A. T. Selman was second with 370.62 points.

Dr. R. C. Miller (100 points) won the hill climb with Mr. Lance Giddings runner-up with 95.64 points in the private section. Mr. Boyd Edkins, 100 points, was first and Mr. Selman second with 85.04 points in the open section.

Boyd Edkins Strikes a Rock.

Mr. Boyd Edkins will receive the sympathy of all motorists at the bad luck encountered by him in his recent attempt on the Brisbane-Sydney motor car record. In endeavouring to negotiate the almost impassible rocky track up Spicer's Gap on the Liverpool Ranges, a piece of outstanding rock crashed a hole into the bottom of the crank-case, with the result that the sump would not hold oil. After vainly attempting to patch up the trouble, the journey had to be abandoned. The holder of the record—Mr. F. Bager—came down the "Gap" in his successful drive; but it is a different proposition tackling the rocky pass in the opposite direction. The reason why record aspirants take this route is because it shortens the journey by some 40 miles.

On his second attempt Mr. Edkins got as far as Windsor (62½ miles from Sydney), running on schedule time, when his car crashed into a culvert. The attempt was then abandoned.

Motoring Through Snow.

The ubiquitous motor is taking the place of dog sledges in the Arctic regions and has absolutely revolutionised the districts on account of the astonishing results in speed, efficiency and load-carrying capacity.

Particularly in Alaska has the change brought a general awakening—commercialism having taken root in a manner undreamt of by even the most romantic of commercial magnates.

An American paper in an interesting article on the subject tells a vivid story of the work which the once despised motor is doing in transporting foodstuffs, engineering supplies and constructional material over snow and ice. Obviously it is not motor lorries that are doing the work but caterpillar tractors similar in design

to those supplied the Allied Governments during the war, but with the addition of a frost pan which covers the radiator, protects the motor and enables it to operate at 50 degrees below zero.

Bullock Charges a Car.

The old saying that "familiarity breeds contempt" was strikingly illustrated on the North Coast of N.S.W., quite recently. It is not so many years since the sight of a motor car on a country—or for that matter a city—road was sufficient to put all kinds of animals, horses, cattle and even dogs in headlong flight. Gradually, however, this feeling wore off, and in at least one instance it was replaced by a lofty disdain for the contrivance which at one time had to do over fifty miles an hour to get within measurable distance of a beast possessing sound limbs and wind.

A party of motorists proceeding along the road outside South Grafton encountered a mob of bullocks travelling in the opposite direction. Darkness had fallen and the road at this point was narrow, with an embankment many feet deep fringing one side. The driver of the car slowed down, and was working his way carefully through the mob of cattle when one hefty beast, resenting the intrusion of the mechanical contrivance into an otherwise peaceful assembly, charged the car and extinguished the only headlight it possessed. In the darkness the driver momentarily lost his sense of direction, and the momentum of the car, aided by the vicious uppercut delivered by the bullock, carried it over the embankment. Fortunately no one was hurt, but the car had to spend a lonely night on the roadside. The driver vows that for the future he will carry a machine gun as a protection against the wild bullocks of the North Coast.

"Renault" Performs Well.

The outstanding performance of the 13.9 *Renault* in the strenuous 1,000 miles Alpine test, recently run under the auspices of the Victorian A.C. is a striking tribute to its durability, efficiency and economy of upkeep.

An absolutely standard 4-cylinder (75 x 120) 3-seater *Renault* car was entered

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for this titanic trial and secured first prize in Class A, and 6th place in total points irrespective of horse power. Throughout this mountainous trial a spanner was not used on the machine, and its engine never missed a beat, the car finishing in perfect condition. Over a 200 mile course the *Renault* did 32½ miles to the gallon of petrol, officially checked. Only three quarters of a gallon of oil was used during the whole run. Five points only were lost on a minor mechanical defect, the other reason for deduction being due to the fact that the driver mistook the time of arrival into a control.

Another striking tribute to the *Renault* is the fact that the *Compagnie des Automobiles les Place*, the largest fleet of taxis in Paris, have just placed an order with the *Renault* factory for 3,200 13.9 chassis to replace their present fleet of *Renaults*, which have been in constant use since 1905.

* * *

A Smart Run.

Mr. S. C. Ottoway put up an excellent performance during the holidays in his 1913 model *Vauxhall*. He travelled from Sydney to Blayney (150 miles) in 4 hours 55 minutes, including stops and time lost in negotiating the very bad stretch between Parramatta and Penrith. Considering the unsatisfactory nature of the road, this time would be hard to beat, and goes to show the wonderful performing power of the old model *Vauxhalls*. The new 30/98 *Vauxhall* is capable of even better performances than the previous models. Taken as a whole there is nothing to equal the 30/98 as a fast touring car in which delightful driving qualities, and ease of control are combined with exceptional power. Its running cost is not, as might be imagined, high, but distinctly moderate. The price of the 30/98 has been substantially reduced, and is now almost back to pre-war and a moderate one for the quality given.

Boyd Edkins Ltd., are the New South Wales distributors for *Vauxhalls*.

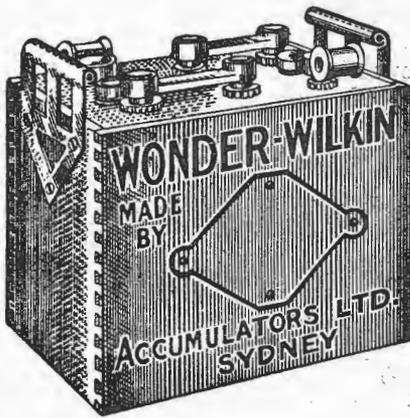
* * *

Condition of Main Roads.

Motorists before embarking on a tour north, south, or west, like to hear the latest on the conditions of the roads about to be traversed

The chairman of the Roads and Tours Committee of the R.A.C. (Mr. D. M. Cooper) and the secretary of the club (Mr. H. C. Morgan) accompanied the Chief Engineer for Works and Local Government (Mr. Percy Allen) on a tour of inspection of the roads which have been, and some of which still are, under reconstruction. They report as follows:

The first objective was Windsor, and this was reached via the Parramatta and Windsor roads. Beyond Parramatta repair work is proceeding and being energetically pushed on by the engineer in charge. From Windsor the direct road to Penrith was adopted, and this road cannot be recommended. The main western road was then negotiated from Penrith to Parramatta, and with this very little fault could be found, the only work remaining to be done being two or three culverts, including one to replace the notorious drain across the road at Penrith. After lunch at Parramatta a course was set for the main southern road, via the Woodville Road, which is in excellent condition, and after proceeding south for some distance the party returned towards Sydney along the southern road, which is now in the throes of reconstruction. Motorists journeying south are advised to hesitate to adopt this route at present, and to take the Parramatta Road to Granville and then the Woodville road, which will bring them out on the Southern road at a point beyond the repair work. The Forest road was reached by way of the Croydon road, Forest road, and Hurstville, thence to Tom Ugly's Point. Here the new punt was found to be running, and this was inspected with interest by the club officials, who decided that it would have the effect of considerably reducing the congestion which hitherto prevailed at week-ends. On to Sutherland, and then the return to Sydney by a road about which it would be difficult to find a complaint, and the party had inspected the whole of the roads which the authorities have so far decided to reconstruct. About 140 miles were covered, and at the conclusion of the tour the club officials were satisfied that the Chief Engineer and his assistants have done, and are continuing to do, excellent work which motorists should appreciate. The work of recon-



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struction must continue until the main highways throughout the whole State are in a condition which will reflect credit upon New South Wales.

Motorgrams

The annual report of the Royal Automobile Club of Victoria discloses an exceptionally good year for that organisation. The total membership stands at 2771. During the year 750 new members were elected. The club is easily the largest of its kind in the southern hemisphere.

Mr. Jack G. Walsh, after spending some years in charge of the sales department of the Canada Cycle and Motor Agency, Queensland, is back in Sydney again, where he will remain. The climate up North did not agree with Mrs. Walsh, hence the return to Sydney.

Mr. Walsh has been granted a certificate by the Queensland Club for a 500 miles non-stop run in a Studebaker Six, the actual running time for which was 22 hours 18 minutes. The car carried a full load, including two observers. The report states: "No mechanical trouble of any kind was experienced during the whole of the trip, and those on board came through without undue fatigue. The petrol consumption worked out at 21.362 miles per gallon."

In winning the petrol consumption test recently, under the auspices of the Queensland A.R.C., Mr. Walsh averaged 34.6 miles per gallon in a Studebaker Light Six.

A Victorian paper suggests that Australian manufacturers of motor bodies should endeavour to be adequately represented at the British Empire Exhibition, at Wembley Park, London, in 1924. By exhibiting examples of Australian coachwork, motor car manufacturers abroad would be enabled to fully realise that Australians can take care of all coach work on chassis imported into the Commonwealth.

Messrs. Percy Oatley (vice-president), W. Mitchell, F. C. Chesney, A. Southwood, J. Williams, J. S. Purdy, and M. McNeil, all members of the Royal Automobile Club of Australia, left for England during May.

Mr. Whiteman, inventor of the Superb Carburetter, is off to England on a business trip. The present company has disposed of the rights for most parts of the

world, and an Australian company is being formed to market the invention here.

* * *

Motor Cycling.

Towards the end of May the Motor Cycle Club of New South Wales was to have conducted a hill climbing test to be contested in three classes, solo, and under and over 600 c.c., and side-cars over 600 c.c.

On June 24 the match arranged between T. Benstead (N.S.W.), and D. Brewster (Victoria), will be held in conjunction with the Clubs' Carnival on the Victoria Park racecourse. Both riders are recognised as the pick of their respective States, and they can be relied on to dispute every inch of the way.

An attractive programme for the Carnival has been arranged, entries for which close on June 9.

* * *

Cycle Improvement.

Besides conducing to more comfort for the rider the spring-motor cycle considerably increases tyre mileage on the driving wheel. The reason is that the spring frame permits the heel to lift under the influence of road shock without affecting the bulk of the weight—that of the rider and machine—whereas in the case of a fixed frame the whole of the structure rises and falls with the wheel as bumps and vibrations occur. The power of a large engine transmitted to the rear wheel and the weight carried combine to induce considerable frictional effect between tyre and road surface, and without the elastic effect of the spring frame the action is, relatively speaking, a dead one, the tyre taking the brunt of the wear as a matter of course.

* * *

Scorching at Bathurst.

The Motor Cycle Club has entered a dignified protest against a report from Bathurst, published in a Sydney paper, in which the members of the club who visited Bathurst during Easter holidays are accused of having ridden through the town at a speed which endangered traffic. In a letter to Bathurst Municipal Council the Secretary, who wrote on behalf of the club, stated that the reference to inadequately regulated traffic was probably intended to apply to the Kelso-Peel road races. The constable on duty at Bathurst have recorded their approval of the methods employed by the club's officials, who regulated the traffic with excellent results.

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WOMEN TO THE FORE.

Scope of Their Activities Gradually Extending

TIME was when women occupied a very insignificant place in both the counsels and activities of the world, but that period is gradually passing away, and each day we see further evidence of advancement which the so-called weaker sex have made in winning recognition from the world's greatest male thinkers and toilers.

Since their emancipation many women have confessed that the greatest obstacle they had to overcome was man's prejudice and conservatism. "We were told that our place was in the home," said one woman recently, "and that if we attempted to extend our activities beyond the family circle we would bring about our own undoing, and do untold injury to the stamina of our future race." "What has been the result?" "Instead of these gloomy forecasts being fulfilled there is ample evidence that much good has followed woman's entry into the social, political and industrial spheres. If the atmosphere of Parliament was such that no woman could enter it and retain her self respect then there was clearly need for a change, and the only proper way to make that change was to uplift the tone of parliamentary debates, and make men realise that a pure and healthy environment was a necessary adjunct to good legislation. So, too, in the social sphere in which women are vitally concerned. It is useless devoting attention to home life if, when young people leave that hallowed shelter for the outside world, they encounter conditions which undermine and destroy the teachings and examples of earlier years. There is a fruitful field in seeking to improve social conditions so that strong-minded children may go out into the world and mingle with their fellow human beings without fear of moral or physical contamination.

In the fields of industry female labour was largely availed of during the war, and helped the Allied nations through a critical period. Will anyone seriously argue now that the world is not a better place because of woman's widened activities?



Just Before You Go to Sleep

THAT'S the time to get rid of the defects in your complexion. Wash your face in warm water, and while the skin is still damp lightly smear a little pure mercolized wax over your face and neck, and leave on until the morning. After a few nights of this treatment the blemishes on your skin should disappear.

Mercolized wax dissolves away the old dry skin and leaves behind a new, healthy complexion. Beauty is but skin deep—mercolized wax brings it to the surface. It is emphasised that this wax is quite harmless, and contains only the purest ingredients, being free from any poisonous mercury salts.

The meaning of the word "mercolized" is "active," and its activity is obtained from its oxygen content, which is Nature's own beautifier. As a general facial skin cleanser mercolized wax is unequalled, being in universal everyday use by up-to-date, discriminating women—husbands also find it beneficial for use after shaving, especially if the skin is chafed. It should always be used before the application of powder, as the wax will prevent the pores of the skin from becoming clogged and unhealthy.

All chemists can supply you with pure mercolized wax, in net, original tins, containing sufficient to last from six to eight weeks. Price, 5/6 per tin, or from

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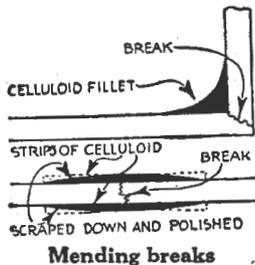
JUNIOR MECHANICS SECTION

In order to keep this section as bright and up-to-date as possible we seek the co-operation of our readers. By contributing simple constructional and experimental items—written in non-technical language that will occupy space varying from a small paragraph to a full page or more—accompanied by diagrams and illustrations, readers will materially assist. All contributions will receive our most careful consideration and, if accepted, will be paid for on publication.—Ed.

REPAIRING CELLULOID ARTICLES.

ALMOST anything made of celluloid can be repaired, patched, built up, and otherwise worked with the aid of ordinary film cement such as is used in splicing motion-picture films. Where there are flat surfaces of sufficient area to give a good hold, the parts are simply cemented together after the surfaces are cleaned by scraping.

If the break is in an angle, put a little film cement in a small bottle and drop into it cut scraps of celluloid film. Old camera films are good for the purpose if all the emulsion has been washed off with hot water. The mixture should be of about the consistency of very soft putty.



Mending breaks

First cement the parts together in the ordinary way, so that they will hold temporarily. Then, with the celluloid mixture work a fillet or filling into the angle to act as a reinforcement, putting the putty on over a coating of cement. Although this dries rather slowly, it gets hard and makes a good job.

A flat piece can often be mended by cementing a thin strip of celluloid on each side. The edges of the strips can be worked down by scraping when the cement has set, so that the surface will be smooth, and can then be polished.

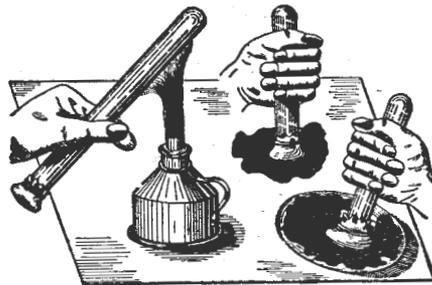
—H. Greene, *Popular Science*.

REMOVING SPILLED INK.

From a German authority we get the following method for removing ink which has been spilled on a table, says *Science and Invention*. It requires a test tube and piece of fine meshed muslin.

Over the mouth of the test tube a little bit of fine muslin is fastened and may be tied or secured by a rubber band. Holding the tube as shown in the drawing, it is heated over an alcohol burner. There will be some moisture in it presumably, and the heating does not want to be pushed so far as to convert this into steam, but a good warmth is necessary.

When it is well warmed, the mouth of the tube with the cloth over it is placed in the ink which has been spilled; as the



air in the test tube cools, and any water which has been mixed with the air will return to the liquid state, a partial vacuum will be formed, and the ink will rise into the tube and leave the table. Two or three of these applications will presumably take care of a great deal of ink. To empty it, the tube is held in an inclined position mouth downwards over the ink bottle and heat applied as before, which will expel the ink from it; or if the cloth is of large mesh, it may be made to leave it by skilful shaking, which of course implies the danger of spilling the

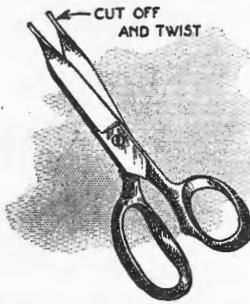
ink about. Whether used for the purpose of picking up ink or not, it certainly is an interesting suggestion for a physical experiment.

* * *

PLIERS MADE FROM A PAIR OF DISCARDED SCISSORS.

If you do not have a pair of light pliers and there is an old pair of scissors at hand, they will make the ground work for pliers.

Heat the ends of the scissor blades in the forge or torch flame and draw the temper. When cold saw them off at the desired length and reheat. Then twist



Old Scissors Make Pliers

the blades in such a way that each one presents a flat surface to the other. When the blades are closed these surfaces should meet firmly in order to grasp and hold an object.

Round off the corners by filing, and tooth the jaws with the edge of a fine file, if desired, then reheat to a cherry red and harden in oil.

* * *

HOW TO FILL DEFECTS IN THE SURFACE OF WOOD.

In building or assembling wooden articles, one quite often finds small defects which must be filled up. Worm holes or checks are generally too small or slight to permit a sliver being wedged in to fill up the open space. Sawdust scraped from the end grain of wood and mixed with glue is sometimes used. If a paste is preferred it can be made of plaster of Paris, mixed with vinegar and a small amount of glue. If the paste is kept submerged in vinegar when not in use, it will prevent hardening and the mixture can be kept soft and ready for use for an indefinite time.

When a veneer is to be applied over a wood defect the paste must be carefully heaped up so that the surface will not drop below the surrounding material. The veneer will then hold solidly above the defect. Veneer applied over worm holes that are not filled in will be drawn down below the surface because the glue will sink into the openings, and these imperfections in the final surface will lessen the value of the furniture.

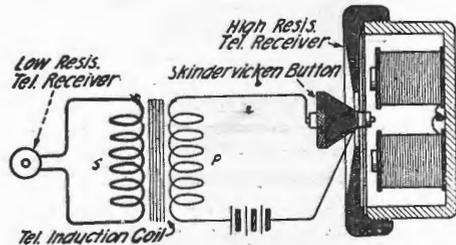
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A SKINDERVIKEN OR MICROPHONE AMPLIFIER.

An inexpensive and quickly-made amplifier may be constructed with a high resistance telephone receiver (about 2,000 ohms) and a Skinderviken transmitter button. Find the exact centre of the receiver diaphragm and drill a hole through which the screw of the button can slip. Make connections to the two binding screws of the transmitter button and connect the instrument to a telephone induction coil, battery, and low resistance receiver, as shown in diagram.

If no Skinderviken button is obtainable, the same device may work with a home-made microphone, as follows:

First, secure a sensitive receiver of about 2,000 ohms resistance. To the diaphragm solder a small brass cup, at the centre, and a wire at the edge. Fasten



the receiver to a wooden base. Now make a brass bracket of the form shown, drill and tap a hole at the place indicated. Remove a carbon from an old flashlight battery and solder it by its brass cap to the end of a piece of threaded rod. Run the rod through the hole in the bracket and put a hard rubber knob on the other end. Make connections, as shown, to a battery, telephone induction coil and low resistance telephone receiver, and the amplifier is ready to amplify.

—J. Liebowitz.
In Radio News.

A BOOK FOR EVERY BOY



Mr. Addyman—the author—recently wrote:—

"A certain lady of my acquaintance once told me that every time I entered her house it was a signal to her boys 'to make a mess all over the place.' That was a long time ago, and though I have never yet found a certain cure for the 'mess' I managed to stop it—more or less—from being 'all over the place' by suggesting that boys should have a workshop of their own. . . . Since then I have written this book."

In this popular book the author has arranged his description of things in such an order that one piece of work suggests the next and helps to explain it.

The whole contents are written in simple and interesting language, and are profusely illustrated with diagrams and illustrations for the experiments mentioned.

THIS BOOK WILL INSTRUCT AND ENTERTAIN YOUR BOY.

You should therefore Buy him a Copy AT ONCE.

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Chancery Lane, Melbourne.**

FINDING MINUTE FLAWS IN METAL.

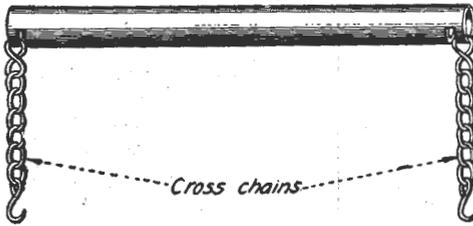
Minute cracks in hardened pieces are easily located if the work is oiled, wiped off, and then chalked. The oil remaining in the cracks quickly soaks through the chalk and becomes visible.

* * *

HOW TO MAKE A HANDLE TO CARRY A STORAGE BATTERY.

A battery service man whose task was to handle a large number of storage batteries daily made the convenient handle shown in the illustration. It provided a handy way to carry batteries from one place to another.

The materials used were a short piece of pipe and two cross chains taken from an old tyre chain. The length of pipe will depend on the length of the battery to be carried. About $\frac{1}{4}$ inch from each



Pipe and Two Chains Make a Convenient Handle for Carrying a Storage Battery

end of the pipe the metal is sawed half-way through and the operation repeated $\frac{1}{4}$ inch farther in from the first cut. The strip left between the cuts is bent in with a punch and then cut out by using a chisel in the end of the pipe.

In each of the openings thus made, a cross chain is hooked and fastened by closing the hooks with a hammer. The hook in the other end of each chain is left open and engages in the handle of the battery to be carried.

* * *

REMOVING PAINT FROM THE HANDS

It is not advisable to use turpentine or benzine in removing paint stains from the hands. By oiling them thoroughly, and then carefully washing with soap, the paint may be removed, provided it has not been allowed to dry too thoroughly on the hands.

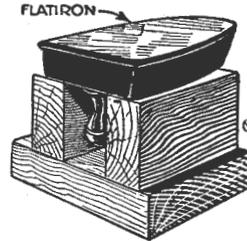
TO REMOVE SMALL BROKEN DRILLS.

A good way to remove small drills that have broken off short is to place the piece with the hole in an upright position and put in a drop or two of undiluted muriatic acid every few minutes until the drill becomes free. It will then shake or fall out if the work is tapped with a hammer or struck against the bench. I have never known this method to fail.

* * *

AN OLD FLATIRON MADE INTO A BENCH ANVIL.

A home mechanic who does not have a big heavy vise will find the suggestion given here of value. An old-fashioned flatiron is held in an upright position by a wooden holder of three pieces of heavy



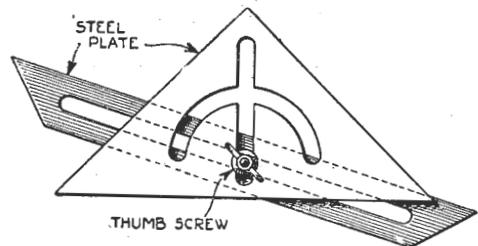
Resting on this support the old flatiron becomes a serviceable bench anvil

board. Two-inch material should be used in the construction of the holder, as the anvil is called upon to withstand a good deal of strain when in use.

* * *

HOW TO MAKE AN EFFICIENT BEVEL GAUGE.

One of the most important tools a mechanic needs is a bevel gauge. Most gauges have their slot ends extend to within $1\frac{1}{2}$ inches from the extreme point of their blades, and so cannot be used



A Bevel Gauge for the Mechanic Which Can Be Used for All-Around Work

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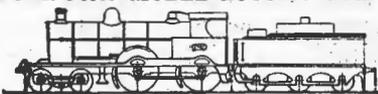
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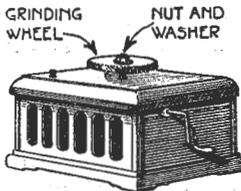
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for all kinds of work. A more efficient tool is shown in the sketch. No dimensions are given as one may be constructed in any size most suitable for the work. It is made of $\frac{1}{8}$ -inch high carbon steel plate cut in triangular shape. The shoulder on the fastening bolt slides in curved slots. The beam is also made from $\frac{1}{8}$ -inch plate. The clamping bolt should be first procured and the slots cut in the steel to fit it. The sharp point of the triangle can be set and used on the edge of a very shallow slot.

GRAMOPHONE MECHANISM FOR TURNING THE GRINDSTONE.

A carborundum, emery, or small stone wheel attached to an old double-action spring gramophone, forms a grindstone suitable for all forms of light work.



Too old for grinding out tunes, the gramophone will grind your tools

First, remove the revolving table, and cut the disc down to, say, 2 or 3 in. in diameter.

Now thread the shaft end to take a small nut. This done, put on the grinding-wheel and secure it in position with a washer and nut. One winding, and the mechanism is good for a number of tools.

PRESERVING VARNISH BRUSHES FOR FUTURE USE.

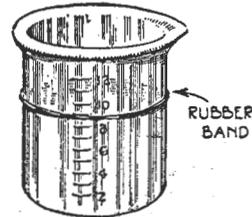
The man who regularly varnishes his floors will not want to invest in new brushes each season when the time comes to touch up his floors. Varnish brushes should never be put into water. They should be suspended in corked jars of

linseed oil. The method of suspension is to bore a small hole in the centre of the cork and wedge the end of the brush into this hole.

CHEMISTS WILL FIND THIS A USEFUL AID.

When mixing compounds it is often necessary to add a certain amount of a liquid frequently. The graduations of

the measuring glasses are very fine and accurate measuring requires much time.



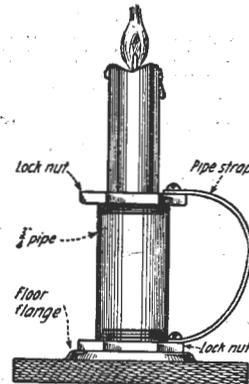
The rubber band greatly expedites repeated measuring

By placing a rubber band at the level wanted, it is possible to quickly pour the liquid to that point, as rubber is easier to see than the graduations would be.

A CANDLESTICK MADE OF PIPE AND FITTINGS.

A neat little candlestick can be made of pipe fittings as shown in the illustration. The base consists of a $\frac{3}{4}$ -inch floor flange with a fairly broad bottom. The standard of the candlestick is made of a 3-inch length of $\frac{3}{4}$ -inch pipe, which should be threaded at both ends for almost $\frac{1}{4}$ -inch.

Thread a lock-nut on one end as far as it will go, and then thread this end into the top of the flange. A second



Pipe and Fitting Make Candlestick

lock-nut should then be turned on the top end of the standard far enough to make it come flush with the top edge.

The handle is made of a length of pipe riveted to holes in the top and bottom lock-nuts. Smooth off all roughness on an emery wheel, then colour or enamel to any desired shade. Such a candlestick will hold a common $\frac{3}{4}$ -inch candle nicely.

—Illustrated World.

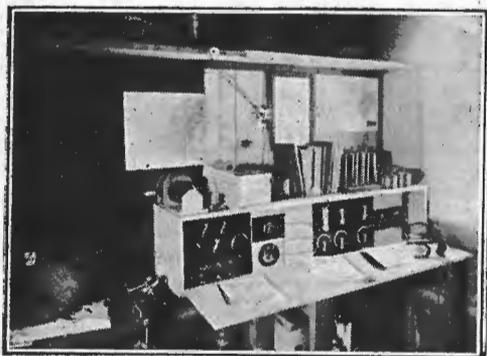
EXPERIMENTAL WIRELESS STATIONS IN AUSTRALIA

Under this heading each month we propose publishing particulars and photographs of Australian Experimental Wireless Stations. We desire all experimenters to contribute to this section. Experimenters, it's up to you! Do it now.—Ed.

Blue Mountains Station.

IN the last issue of *Sea, Land and Air* (p. 137) we mentioned the excellent results secured by Messrs. E. T. Vears and W. C. Bolton on the Blue Mountains of New South Wales.

The accompanying photograph shows Mr. Vears's experimental station at Leura, New South Wales. The cabinet containing



Mr. E. T. Vears' Experimental Station, at Leura, N.S.W.

set is divided into compartments, the first on left containing long wave inductances between 3,000 and 19,000 metres, second compartment short wave inductances 600-1,100 metres, and primary tuning condenser. The third compartment contains secondary and tickler condensers. Next is the detector-amplifier, consisting of one audiotron valve and two "V24" valves. Following that unit is the high and low tension batteries.

The inductance coils used for long wave reception are of the layer wound pancake type, and those for short waves of the spider web type. Mr. Vears considers the latter type are the finest coils he has used for work on wave lengths of and around 600 metres.

The transformers are all home-made, and the building of them was ingeniously effected with an old drill clamped in a vise.

The aerial system is composed of two separate aeriels—one a 2-wire inverted L., 90 feet long, with an average height of 35 feet from ground, and the other a single wire, 350 feet long, about 25 feet high.

With this experimental station Mr. Vears has heard practically all Australian and New Zealand coast stations and ships at sea. On long wave reception European and American stations over ten thousand (10,000) miles away have been plainly read.

Caulfield (Victoria) Station.

The following is a description and photograph of the wireless experimental station of Mr. H. W. Jenvey, M.I.E.E., at Caulfield, Victoria. Mr. Jenvey, one of the early experimenters in Australia, was recently State Electrical Engineer for Victoria.

The aerial system consists of two masts fifty feet high, between which is strung a three-wire aerial, 150 feet in length. The down lead is taken direct from one end of the aerial to the receiving room. The earth lead is soldered on to a water pipe running a few feet below the window of the room.



Mr. H. W. Jenvey's Station, at Caulfield, Victoria.

The set is of the panel type, on which is mounted an Ediswan valve, filament resistance and switch, grid condenser, grid leak, tuning condenser and various switches,

including a four-pole, two-way switch for changing from long wave to short wave, and D.P.D.T. aerial switch. A micrometer gap is also placed near the aerial switch, so that any charge in the aerial passes direct to earth through it, thus safeguarding the instruments.

On the table is placed the 3,000 metre loose coupled tuner, and the 600 metre tuner. The former tunes from 600 to over 3,000 metres, and consists of 250 turns of No. 20 enamelled copper wire on a 10 inch by 6 inch tube, being tapped off in such a way as to be able to tune down to one turn. The secondary slides inside the tuner, and consists of 200 turns of No. 20 E.C. wire. The 600 metre coil is made after the style of a variometer, the reaction coil, a small honeycomb coil, rotating inside the tuner, which is wound with 20 turns of No. 20 D.C.C. on a 4 inch diameter former. The tuning condenser is connected across the coil change over switch, so that it is always in a parallel with one of the coils.

The high tension battery is made up from reject Ediswan "Type 2" dry cells, which were obtained in Melbourne, for 5s. per doz., through the Wireless Institute. Though classed as rejects, they are good cells, and give ample current for high tension work. The filament battery consists of two 4 volt 40 ampere hour accumulators, one of which is tapped at the bridging connection for two volts, six volts being used on the filament of the valve. The phones used are Brande's superior type, also a pair by Messrs. Bartram, Melbourne, which are very good, but not quite as sensitive as Brande's.

All the Australian and New Zealand stations are easily read. Ships at varying distances are heard, excellent signals being received from the *Makura* when near Suva, Fiji. About the most distant stations read on 600 are Amboina and Koepang, Dutch stations to the north of Australia, which are heard regularly, summer and winter. Once, about 3 a.m., JOS Osezaki, Japan, was heard quite clearly on 600 metres. On the longer wave coil Apia (Samoa), Noumea, Rabaul and others are heard well, as well as many faint signals, presumably American stations. Another valve would be necessary to bring them up to a readable strength, though occasionally the signals of American stations have been received at a fair strength. One station in particular, KUBJ, Liberty Minquas, United States of America, was received strongly

while sending time signals about 11.30 p.m., Victorian time, on 2,000 metres.

A pile wound inductance with fixed capacity condensers (*vide Wireless World*, March 19, 1921 issue) to tune up to 25,000 metres, is now under construction, and this will, no doubt, bring in many of the more powerful long wave stations.



Foolish Questions.

—(Los Angeles Examiner.)

WIRELESS NOTES

Valve Sets.

THE best results are obtained through the medium of valve receiving sets.

With these it is possible to build up and amplify the infinitesimal currents received, and deliver them to a loud speaking telephone which reproduces signals, speech and music as loud as though it had originated in the room where it is being received.

These instruments are extremely sensitive, and need delicate adjustment. The apparatus containing these sets has been so developed that there are only two adjustments necessary to make before results are obtained, one to adjust the tuner, and the other to adjust the brightness of the filament in the valve.

With these sets it is necessary to have a six or eight volt storage battery and a high voltage dry cell battery. The manner in which these are attached to the instruments is carefully described on the apparatus, so that no mistakes can be made. Suitable resistances regulate the amount of current that passes through the valve.

The valve is simply an electric light bulb specially constructed with a metal sheath and a coil of wire placed around the filament. Both the coil of wire and the sheath perform special functions, which it is not necessary for the novice to bother about. He must, however, for the purpose of his pocket, bother about the filament.

In this connection there are two or three rules it is well to remember and put into practice when using such a receiver. Do not let the filaments burn too brightly, because you are unnecessarily shortening the life of the valve, and getting no corresponding benefit from it. As soon as you have obtained maximum signals in the telephone receiver, do not burn the filament too brightly or the receiver will shriek or howl. Another rule is to watch the storage battery, and as soon as it begins to show signs of weakness have it recharged. This is important, and should never be overlooked.

It should be noted that before a license can be obtained permitting the use of valves, the applicant must pass a receiving test of twelve (12) words per minute.

Rigging an Aerial.

The best way to rig up the aerial is to run it from the top of a chimney in the front of the house to another chimney at the rear of the house; then lead it into the house through an insulator. Great care must be exercised wherever the aerial is supported to have it completely insulated. This is such an important point that it cannot be over emphasized.

The aerial can be made of No. 3/20 B. and S. gauge copper wire, which will last a long time.

Adjustments.

As soon as your station has been installed the best thing to do is to adjust the set until maximum signals have been obtained, and write down the various adjustments. Then whenever you wish to listen to any particular station again all you will have to do is to make the various adjustments previously noted.

Crystal Detectors.

In adjusting the crystal detector it is necessary to turn the movable contact over the face of the crystal until a sensitive point has been found. A little experience

in adjusting will soon permit you to determine when this has been done. You will know it by the strength of the signals you obtain in the receivers upon your head.

Another method of determining the sensitive point on the detector is to employ a buzzer for the purpose. This little instrument can be bought cheaply and operated by a single dry cell, or one can be made by taking the gong and striker from an old electric bell. The little spark on the contact maker of the bell sends out electric oscillations which will actuate the detector and enable you to find the most sensitive spot.

How Wireless Receivers Operate.

Wireless receiving apparatus consists of three main divisions—the tuner, the detector and the receiver.

The first is the actual wireless telephone or telegraph circuit, by which the entire receiving apparatus is put into synchronism with the transmitting station. It is extremely easy to adjust, and needs only a slight turn of the handle attached to a graduated disc, which generally bears the name "tuner" engraved on the handle.

The detector gets its name from the fact that it detects the passage of the very minute wireless currents that pass through the wireless circuit. It also actuates the receiver.

The receiver is simply a telephone, and it registers the currents that are passed through the detector. There are two main types of receiver in wireless telephone work—the type which is worn over the head and the loud-speaking type, which can be heard all over a large room.

OUR QUESTION BOX.

G.S. (W.A.).—Question (1): *Can you tell me the exact time, Fremantle time, that the Adelaide Radio (VIA) sends out time signals?*

Answer (1) At 2 a.m. and 2 p.m., Western Australian time.

Question (2): *Is the circuit (shown in letter) suitable for telephony reception?*

Answer (2): Yes, but do not allow valve to oscillate.

Question (3): *Will it be possible to hear telephony from Melbourne, with circuit referred to in Question (2), using twin 'phones each 1,500 ohms and 3-wire aerial 40 feet high and 80 feet long? If so, what time does Melbourne transmit?*

Answer (3): Possibly, if not, use higher aerial. No definite times are fixed, so far as we know.

(Continued on Next Page.)

(Questions and Answers Continued.)

Q.R.U. (Tasmania).—Question: *What is the minimum age at which wireless operators are employed on board ship?*

Answer: Eighteen.

"Sparks" (Queensland).—Question: *What steps should be taken in order to become a radio-engineer?*

Answer: Commence by obtaining a First-Class Certificate of Proficiency in Radio Telegraphy. The Marconi School of Wireless, Sydney, would send you further particulars on application.

* * *

450 MILES.

WIRELESS TELEPHONY.

EXPERIMENTER'S SUCCESS.

AUSTRALIA'S wireless experimenters are gradually proving that they can "do things" as well as experimenters in other lands.

Last month Mr. C. Maclurean completed the construction of a new wireless telephone transmitter, and after having installed same in his experimental station at Strathfield, N.S.W., commenced testing with the Sydney Observatory. Music and speech was transmitted during the tests, and in addition to being clearly received in Sydney and suburbs by many other experimenters, reports have come to hand stating that his signals were also received over two hundred miles inland.

Other experimenters in Melbourne, Vic., happened to be "listening in" one evening last month when a test was being held, and they also clearly received the signals from Strathfield, Sydney, 450 miles away. Mr. "Joe" Reed was among those in Melbourne who intercepted the Sydney signals, and he subsequently stated that both the music and speech was received extremely well. The power used in transmission was only nine watts, equivalent to the power required for the tail-light of a motor car.

In addition to Mr. Maclurean, those who received his signals should be congratulated, because they have established what is believed to be a world's record for amateur wireless work on such low power.

* * *

ADVANTAGES OF HONEYCOMB COILS.

Honeycomb duo-lateral and lattice wound coils possess many advantages over the usual form of loose-coupler, and similar tuning arrangements.

They have a very low distributed capacity, which becomes very apparent in ordinary tuning coils when at a wave-length exceeding 1,500 metres.

All the fine tuning is obtained by variable condensers in shunt across both primary and secondary. The true note is obtained by varying the coupling between primary and secondary, also the tickler, if used. Dead end losses are absolutely eliminated by the use of honeycomb inductance coils.

By actual experiment it has been determined that the high frequency resistance of these coils is only 20 to 27 per cent. greater than the D.C. resistance, against the usual 100 per cent. of the average inductance coil.

These coils are remarkably small as compared with their inductance values, a coil four inches in diameter, and one inch thick will give a wave length of about 15,000 metres. Various mountings are furnished with these coils; when properly mounted as a coupler they make an instrument which cannot be surpassed in efficiency and selectivity.

All types of stations may be received in this way, including the short-wave spark stations and the extremely long-wave undamped stations. The sharpness of tuning and the amount of regeneration possible on all wave lengths is remarkable.

This form of coil was adopted for many commercial radio outfits owing to its great space economy.

—Contributed by Mr. Gordon Dawson.

* * *

N.S.W. MILITARY RADIO ASSOCIATION.

This progressive body of wireless enthusiasts saw an opportunity of again demonstrating the utility and rapidity of wireless communication on the day the Aerial Derby was held in Sydney last month.

Particulars of the set, personnel and work accomplished appears under the heading of "The Aerial Derby" on another page in this issue.

On the evening of June 7 this association is holding a dance at the Engineer's Depot, Moore Park, Sydney. It is hoped that arrangements will be made for the reception of music by wireless loud enough for those present to dance to. Tickets (3/ double, 2/ single) are obtainable from the Hon. Sec., Mr. O. F. Mingay, Kuring-gai Chase Road, Turramurra.

The "Electrical Times" Caters Specially for Wireless Men

In many out-lying Wireless Stations, the March issue was read with enthusiastic interest because of the special wireless articles it contained. Now, with the May number comes a further important article by

**Mr. JOSEPH G. REED (Melb. Radio Service),
on "VALVE AMPLIFIERS."**

In this article, Mr. Reed clearly describes Valve Amplifiers, and explains their use. It is well illustrated with photographs and diagrams. Read it for yourself—you would like to have this information at your fingertips, so order your Subscription to start from May. You will not be disappointed with future issues. All editorial matter in the "Times" is of a high standard.



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HINTS FOR WIRELESS NOVICES

(1) One of the most important things that all wireless experimenters should do is to determine where their aerial is to be placed. It should be wherever possible, in a horizontal position relative to the ground and in the shape of an inverted letter "L," about thirty feet high, with the free end pointing away from the transmitting station. The aerial should be well insulated, and in the event of it being necessary to make any joints they should be soldered.

(2) A good earth connection is imperative. In city and suburban homes it is best obtained by soldering the wire to a water pipe. If a water pipe is not available a sheet of copper plate about ten feet square should be buried in moist earth.

(3) By the use of a single pole double throw switch. The aerial can either be connected to the instrument or the earth when not being used.

(4) In making electrical connections between the various instruments, it is important to see that all such connections are tightly made.

* * *

Experimenters Note.

We desire to publish details of the results you are obtaining in the reception of both telegraphy and telephony. Write to the Editor, *Sea, Land and Air*, 97 Clarence Street, Sydney, advising what stations you have heard during the past month, also how you have received the wireless music.

* * *

WIRELESS PROBLEMS.

Any wireless experimenters who may be experiencing difficulty with their apparatus should write to the Editor, "*Sea, Land and Air*," 97 Clarence Street, Sydney.

In the letter particulars should state what the trouble is, the kind of apparatus being used, diagram of connections, and any other facts that may be considered necessary.

Answers to questions of general interest will be published in our "Questions and Answers" column each month. If a personal answer is desired, a stamped and addressed envelope should accompany the query.

JUST TURN THE KNOB ON AND LISTEN.

Wireless is not a black art! There is no mystery about. It is as simple as A.B.C. Operating a small radio receiver is just like focussing a camera or playing a phonograph. There are no confusing adjustments to be made, no fuss, no bother.

"Turn the Knob on and Listen"—and that is all there is to do. No expense of installing to be done. The thrill that radio brings can be experienced by anyone in any place.

—Radio News.

* * *

MOVEMENTS OF WIRELESS OFFICERS.

T. H. McWilliams, from *Waiotapu* to *Maori*.

C. F. Griffiths, from *Marama* to *Waiotapu*.

H. Taylor, from *Victoria* to *Hobson's Bay* (2nd operator).

G. T. Davies, from *Hobson's Bay* to *Victoria* (2nd operator).

J. A. Cooper, from *Mallina* to *Enoggera*.

A. E. Sheppard, from *Ooma* to *Marsina*.

R. J. Inglis, from *Werrabee* to *Erriba*.

B. Boni, from *Zealandia* to O/C. *Minderoo*.

L. S. Lane, from leave to *Zealandia*.

G. Maxwell, from *Hobson's Bay* to O/C *Boonah*.

L. R. Dickson, from *Navua* to leave.

W. A. Hawkins, from leave to *Navua*.

R. S. Taylor, from *Maori* to O/C *Marama*.

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AN ESKIMO EXPERT IN WIRELESS TELEGRAPHY

JUST inside the Arctic Circle, seventy-five miles from the western coast of Alaska where it borders on Katzelne Sound, is the village of Noorvik with three hundred and fifty Eskimo population. Here the Government maintains its most northerly wireless station, probably the farthest north on the globe, messages from this isolated land being flashed to the outside world *via* Nome and Nulata. Isaac Newlin, in his early twenties, is Noorvik's native wireless operator, school-teacher and mechanical genius.

Isaac comes from primitive Eskimo stock. His ancestors were river people, Papa Newlin being known as a Kobuk river man. He sent Isaac to school where he became a bright pupil and soon passed the sixth grade, which was the highest he could achieve in the limited educational facilities provided.

About that time the Noorvik Eskimos established a co-operative sawmill and the machinery of this plant so attracted Isaac that he obtained employment there. He developed mechanical genius, and besides keeping the mill machinery in shape was in demand whenever an engine in the river gas boats went out of commission. Establishment of the Government wireless station at Noorvik was the signal for him to study the intricacies of the radio and he became a devout student of Marconi. With home-made keys he devised a crude wireless set and stretched land wires between the village houses. The operator of the Noorvik station loaned the enthusiastic boy radio books from which he learned the code.

At the time the Government decided to install a small radio station at Kotzebue, less than a hundred miles distant on the shores of the Arctic Ocean, Isaac, now considered an adept operator, was sent to Kotzebue to install the outfit. This marked a new epoch in Federal education of Far-North natives, for he was the first Eskimo to operate and install a wireless station.

Leaving school did not stop Isaac's thirst for knowledge and he studied assiduously during the long Arctic night. At Kotzebue he took charge of a small native school, besides operating the wireless station and sending radio messages to the big station at Noorvik. Later he was called back to

Noorvik and was installed as assistant teacher at a Federal Eskimo school, which is maintained in connection with a hospital in that village. To-day Isaac is assistant teacher at Noorvik, as well as assistant operator of the radio station. Recently he married the village belle. Her name is Florence Pommak, and she owns sixteen reindeer in the big Noorvik herd. The couple live in a two-story frame house, neatly furnished with some of the attractions advertised in mail-order catalogues.

Young Newlin, with other progressive natives, is now seeking civic improvements in his village. Noorvik is the historic Eskimo village that was built over-night. The Noorvik natives originally lived at Deering on the bleak Arctic Sea coast where they made their homes in the semi-underground hovels of their ancestors because of lack of timber. Food was also scarce, so the populace one day packed up and drove their dogs and reindeers nearly two hundred miles up the Kobuk River, where the Government presented them with a domain fifteen miles square and abounding in game, fish and timber. On this tract in the Arctic wilderness Isaac and his parents and the other colonists under the leadership of the Government teachers built a village with well laid out streets, neat single-family houses, gardens, a mercantile company, a sawmill, an electric light plant, and a wireless telegraph station which keeps them in touch with the outside world.

It is the present plan to have a network of wireless stations connecting the Eskimo villages, supplementing the present Government stations which are now engaged in flashing weather reports to the outside world, in addition to doing a lucrative commercial business for the Government. With the establishment of this chain of wireless stations, covering a vast area of almost inaccessible barrens reaching even to the isolated islands and dangerous coasts of the Bering and Arctic Seas, there will be provided an interesting field for ambitious Eskimo youths. Also, this radio system may prove of incalculable benefit to mariners operating on the dangerous coasts of the Far North.

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WIRELESS INSTITUTE OF AUSTRALIA.

NEW SOUTH WALES DIVISION

A GENERAL Meeting was held at the Institute's Club Room at Queen's Chambers, Dalley Street, Sydney, on Tuesday, May 9, at 8 p.m., Mr. H. A. Stowe occupying the chair.

The minutes of the previous meeting were read and confirmed.

Mr. F. Basil Cooke then presented the prizes to the winners of competition No. 2, as follows:

First Prize: Won by Mr. H. A. Stowe, for a paper entitled, "Combined Wave Meter and Capacity Bridge."

Second Prize: Won by Mr. P. Sewell, for a paper entitled, "Ammeter for Valve Panel."

The following were then elected to the Institute:

Members: G. W. Exton, Lismore, N.S.W.; C. H. Norville, 93 Alfred Street, Milson's Point; R. C. Allsop, "Levenshulme," Botany Street, Randwick.

Associate Member: W. de V. Hunt, 378 Park Road, Paddington.

The business of the evening was a discussion on the "Relative Results Obtained Commercially and Experimentally," in lieu of Mr. Bartholomew's lecture, which had to be postponed temporarily.

Two leaders were appointed to discuss the question, *viz.*, Mr. Malcolm Perry, on behalf of Commercial Results, and Mr. F. Basil Cooke, on behalf of Experimental Results.

At the conclusion a conference of leaders deduced the following:

At the outset it should be remembered that an amateur is only an amateur insofar as he is a lover of the science. This is naturally implied from the root meaning of amateur, *viz.*, a lover. What is it about wireless which is so fascinating to us all? Is it the curiosity of hearing what others have to say, or is it rather the desire to really accomplish something definite and to create the wherewithal for the fulfilment of our ambition?

The former is merely an intruder and an eavesdropper, and deserves no further consideration from the scientist, while the latter should be encouraged in every possible way as a national asset.

If the true experimenter is going to use commercial apparatus he is at once going to limit his researches to the capabilities of his particular piece of apparatus which has only been

designed to fulfill the ideas of someone else, and, further, he is restricted by the limitations of his bank account.

It might reasonably be assumed that the average amateur has only a limited financial capacity and, consequently, if he uses commercial apparatus he is very soon at the end of his resources. Further, using someone else's apparatus and obtaining the best possible results therewith, he has only demonstrated the capabilities of the original designer of the apparatus, and has actually attained nothing of any scientific value either to himself or to the world at large.

On the other hand the true experimenter will design his own apparatus to meet his own requirements. We all know that home-made apparatus is much less costly than the purchased article, consequently for the same amount of available capital the amateur has much greater latitude for carrying out his researches.

Even commercial apparatus at one stage had to go through the home-made stage before it became the finished article capable of performing its functions.

We see, therefore, that the commercial apparatus is the fulfilment of the original designer's ideas. Are the ideas of the amateur ever fulfilled finally? No! Because as soon as he has achieved his goal he is after something greater, and so it goes on.

Home-made apparatus usually lends itself much more readily to alteration and extension, than does commercial apparatus, which is made as fool-proof as possible.

With respect to actual results obtained with commercial and home-made apparatus we find right throughout the history of wireless, the amateur with his home-made apparatus performing feats which the commercial apparatus is not capable of doing. This is, of course, quite natural, as the commercial gear is not designed for freak work, but so long as it performs the work it is intended to do nothing further is expected of it.

If our own association we have seen the results obtained by some of our members. Several distance trials with very low power have been so startlingly successful as to place home-made and home constructed apparatus on a plane of its own from the point of view of the really ambitious amateur.

Only quite recently one of our members transmitted a distance of three hundred and sixty odd miles, using about ten watts of current.

In the *Scientific American* for April there is a striking article of some tests made by a body of amateurs using home-made apparatus, which shows clearly what can be achieved by the experimenter with his own made instruments. It would perhaps interest the reader to quote a few passages from this article:



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"That marvellous feat of signalling, which has given rise to considerable comment on the part of the scientists and engineers throughout the country, took place during the latter part of December, when the amateur radio operators of the United States, through their official association, the American Radio Relay League, conducted a series of tests to determine the possibilities of international amateur radio communication. To this end they sent an expert from their ranks, Mr. Paul F. Godley, to England with detailed instructions to "listen in" between 7 p.m. and 1 a.m. each night from December 7 to December 16 inclusive.

"On the night of the 9th, however, conditions were ideal, and for the first time in the annals of amateur, short wave, low power, trans-Atlantic communication became an accomplished fact. It was at this time that Mr. Godley reported in his daily return telegram, that he had picked up the signals of the American amateur station IBCG, and that these signals were strong and readable. After this and until the closing date, December 16, IBCG and other stations con-

tinued to "carry across the Pond." In all, these stations numbered twenty-seven. Not only were some of these stations heard in England and in Scotland, but in one case an entire message was copied in Amsterdam, Hamburg and in the Carolina Islands, proving that the signals were radiating equally in other directions.

"An analysis of the report in the technical facts connected with these tests, that of the twenty-seven stations heard across the Atlantic, twenty-four employed C.W. transmission, with power inputs ranging from fifty to one hundred watts."

From the foregoing it will be seen that under certain conditions almost incredulous work is being done by amateurs with home-made instruments.

In conclusion, we might easily wonder what next will be accomplished in the way of inter-communication when we, at the present time, are able to send messages three thousand six hundred miles, using only as much power as will light a single electric bulb visible at about two miles distance.

SOUTH AUSTRALIAN DIVISION.

THE monthly General Meeting of the South Australian Division was held at the Y.M.C.A. Buildings, Gawler Place, Adelaide, on Wednesday, May 3.

Mr. Hambly Clark presided over a large attendance, including Mr. Thrumm, of the Adelaide University, and Mr. Caldwell, Resident Engineer of the Railways at Mile End.

The minutes of the previous meeting were read and confirmed.

Two new members were elected, and two applications for membership were received.

One resignation was received from an old member who is unable to continue experiments owing to pressure of business.

The younger members of the Institute are being persuaded to read papers at meetings and to take part in the discussions on various subjects. As a result three papers were read, which proved to be eye-openers, and proved interesting to everyone present.

The first paper was read by Mr. R. T. Edgar, on "Past Experiences with Wireless." Mr. Edgar related his first experiments with an old coupler and crystal set; then his subsequent work, down to his present set, in which is used honeycomb

coils and valve. The description of his experiences with accumulators was given in humorous style, as also were many other parts of his interesting discourse.

Mr. Earle followed with a paper on the "Theory of Ether Waves," which proved both interesting and instructive.

Mr. Deacon also described his experiences with a set, beginning with a single slide tuning coil, then with a coupler, and later with spider web and honeycomb coils.

Mr. Thrumm said that he was very pleased with the efforts of the young members who had entertained the meeting with such interesting papers. He was also pleased to see the large attendance, as he had no idea that the Institute had such a strong body of members. Mr. Thrumm then promised to give a lecture at some future date.

A hearty vote of thanks was tendered to the speakers, thus bringing to a close one of the best meetings that has been held by this Division.

Members and others desiring to communicate with the Hon. Secretary are requested to note that his address is now 20 Grange Road, Hindmarsh, S.A.



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BOOK REVIEW

CONTINUOUS WAVE WIRELESS TELEGRAPHY, Vol. I., by W. H. Eccles, D.Sc.

The preliminary announcement of Professor Eccles' book was made so many months ago that one really began to doubt whether it would ever appear. The publication now, however, happens to coincide with a pause in the development of the subject, and because of this, and also because of the necessary incompleteness of any book on wireless published during war-time conditions, one guesses that the volumes of this treatise will not have suffered for the delay.

The first four chapters contain a short sketch of the history of the subject, followed by a very thorough treatment of electro-dynamics and alternating current theory. It is very difficult to produce something fresh in a treatment of the elementary facts of electricity, yet Professor Eccles has managed to do so. As a typical example we might cite the novel proof on page 34, in which it is shown that the lateral pressure of a tube of electric or magnetic force is equal to the longitudinal tension. We have in mind more than one proof of this theorem in standard text-books that weary the student unnecessarily.

In the treatment of electro-magnetism the author thinks it wise "to follow Oliver Heaviside's and J. J. Thomson's methods of combining the purely physical intuition of Faraday with the mathematical reasoning of Maxwell." Thus the treatment throughout is based on J. J. Thomson's assumption that the magnetic effects of a current are due to the motion of Faraday tubes. This point of view was first developed comprehensively by J. J. Thomson in his supplementary volume to Maxwell's treatise, and also in his "Elements of the Mathematical Theory of Electricity and Magnetism." It is the only satisfactory treatment possible if, as throughout the present volume, the physics is counted as being of greater importance than the mathematical process.

The subject of self and mutual inductance is mainly developed from a consideration of the energy in the field of a current, though Neumann's formula for the mutual linkages of two circuits is also given. The calculation of the inductance of certain simple geometrical forms is, however, carried out with the simplest mathematics.

The treatment of the second law of electro-magnetism is again based on the conception that the magnetic field is due to moving Faraday tubes, but here the effective inertia of the tubes becomes of importance and we are concerned with the electric forces necessary for accelerating and retarding the motion of the tubes. This portion of the book closes with a section on units in which the author makes the suggestion that, as names have already been given to the principal practical units (*e.g.*, farad), we might consider this term as generic and shorten our usual expression "electro-magnetic unit of capacity" to "emfarad," and so on.

The treatment of alternating currents and

oscillations throughout is a graphical one, much use being made of crank or Argand diagrams. The section on harmonics leads naturally to a practical discussion on Fourier analysis, the whole of which is summarised in a very useful paragraph, which also includes rules for the rough analysis of a periodic curve by inspection. The mathematical treatment of oscillatory circuits includes an analysis of almost every combination of inductance, capacity, and resistance than can be conceived, but, by the use of Heaviside's "resistance operators" the mathematical formulae are never allowed to become unwieldy.

The section on ionic tubes is the most exhaustive discussion of the physics on the triode that has yet appeared in English. Though much has been written on the subject, the author has again something fresh and new (*e.g.*, in the section on soft tubes). But probably the most interesting portion of this chapter is that dealing with the theory of the action of the control electrode. So very much work has been done, using experimentally-obtained characteristics, that it is refreshing to find an attempt to interpret these curves in terms of known physical laws. The case of the planar triode is of course satisfactorily dealt with in Maxwell's treatise, but the author prefers to deduce an expression for the voltage factor from first principles, arriving at a result which is practically identical with Maxwell's. What one misses here is a definite statement as to what the voltage factor is physically. Thus an interpretation of one of the equations here used shows that the voltage factor is taken as the ratio of the difference of potential between the anode and the mid-point of one of the grid spaces to the difference of potential between the mid-point previously mentioned and the grid wire. It is not, however, difficult to show that the value of the voltage factor here used is really equal to the ratio of the number of lines of force ending on the grid to the number ending on the anode, when the two electrodes are maintained at the same potential with respect to the filament. This alternative definition emphasises the superiority of the grid over the anode for use in controlling the field strength near the cathode in an amplifying tube.

In the section on grid currents some quite new material is introduced. The question as to how the total thermionic current is divided between the two positive electrodes is a matter of great interest, and one very much regrets that considerations of space prevented Professor Eccles from developing in full the formula he gives for this distribution. There still appears to be much work necessary before the relations between grid and anode currents and the electrode potentials are fully elucidated, as secondary emission appears to play quite an important part at relatively low potentials.

The volume closes with a very exhaustive account of the many methods in use for measuring the various parameters of triodes. The index is admirable in every way and adds greatly to the value of the book.