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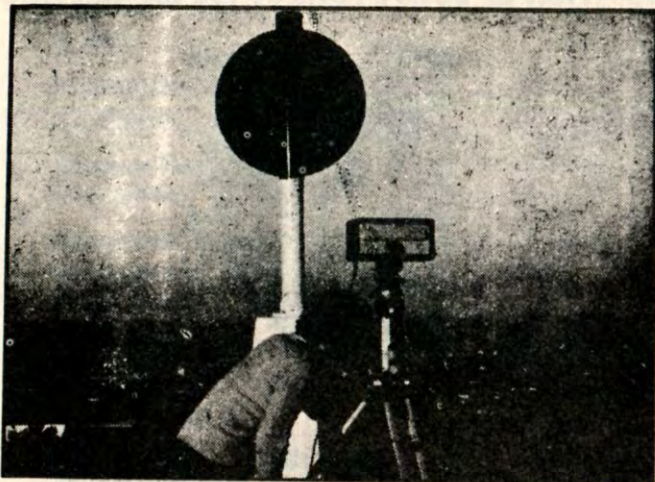
No. 1

Editor

D. C. Forster
P.O. Box 1108
Boroko
P.N.G.

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EDITORIAL

Congress time is almost upon us again, it is unfortunate that the original idea in 1975 was to combine with C.A.S.T.L.E. here but it did not eventuate. Pity but the C.A.S.T.L.E. people have missed a great place to have a Congress.

The Congress Committee led by David Johnstone has been flat out over the last six weeks finalizing outings for the ladies and the papers which always seem to come at a rush in the last month making printing a real hassle. But it is falling into place and should be a great week to feed the mind and the palate.

Port Moresby weather is usually pleasantly mild at this time of the year though at the time of writing the weather has been somewhat unseasonal with gusty winds causing havoc among the sailors, rainy and overcast conditions with an almost unbelievable low of 22°C in the editors house recently. Reminds one of good old Melbourne Town (or Sydney or wherever you happen to come from), having one of their warmer spells, but here it is almost cardigans. It's a matter of putting up with the goose pimples or the smell of moth balls.

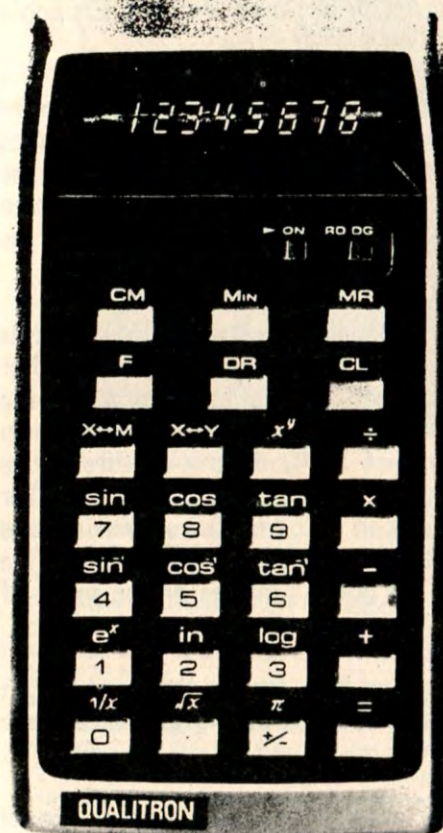
But to those who are coming here for the Congress a light jacket may be necessary late in the evening and perhaps a plastic raincoat.

Despite this you can be assured of a new experience in Congress's as others who have been fortunate enough to attend in years gone by will tell you, they are not quite like those anywhere else in the world.

EDITOR

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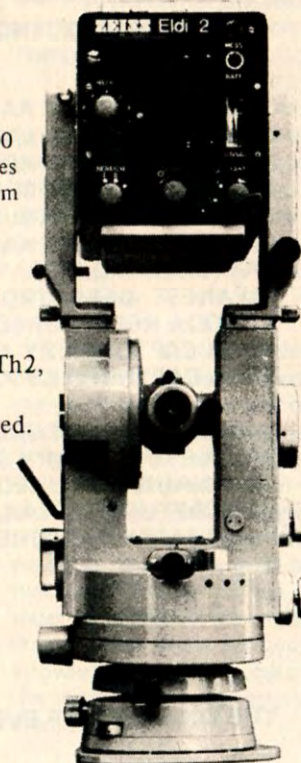
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THE BULLDOG—WAU ROAD

by

W.J. REINHOLD, O.B.E., M.C., B.E., M.L.E. (Aust.)

SEQUENCE OF EVENTS

1942	
23 Jan.	JAPANESE OCCUPY RABAU AND KAVIENG.
9 Mar.	JAPANESE OCCUPY LAE AND SALAMAU.
8 April	JAPANESE OCCUPY ADMIRALTY ISLANDS.
9 May	BATTLE OF CORAL SEA.
22 July	JAPANESE OCCUPY BUNA AND GONA.
29 July	JAPANESE OCCUPY KAKODA.
26 Aug.	BATTLE OF MILNE BAY COMMENCES.
1 Sept.	JAPANESE DEFEATED AT MILNE BAY. THE FIRST DEFEAT.
2 Nov.	KAKODA RECAPTURED.
9 Dec.	GONA CAPTURED BY A.I.F.
14 Dec.	BUNA CAPTURED BY A.I.F.
1943	
18 Jan.	SANANANDA CAPTURED.
8 Mar.	BATTLE OF BISMARCK SEA.
12 Sept.	SALAMAU CAPTURED BY A.I.F.
16 Sept.	LAE CAPTURED BY A.I.F.
2 Oct.	FINSCHAFEN CAPTURED BY A.I.F.

THE SEQUENCE OF EVENTS IN NEW GUINEA, 1942

The Japanese occupied Rabaul and Kavieng on the 23rd January, 1942, and followed up this success with the capture of Lae and Salamaua on the 8th March, Buna and Gona on the 22nd July and Kakoda on 29th July.

Fortunately, on the 9th May, the battle of the Coral Sea had denied to the enemy the immediate fruits of these victories. However, on the 26th August, the enemy launched an attack on Milne Bay, and suffered a heavy defeat, his first real setback.

In this respect it is interesting to note that, in the first half of the year, our American allies had landed engineer units at Milne Bay and had commenced the construction of three airstrips. One, No. 1, was in operation when the battle commenced, and No. 3 was well under way. No. 2 was abandoned. It was at No. 3 strip that the enemy was held and thrown back.

To support the U.S.A. force, the 7th Australian Infantry Brigade, a Militia unit, under the command of Brigadier John Field, was put ashore at Milne Bay late in July, and the 18th Brigade, veterans of the Middle East, under Brigadier (now Major-General) George Wooten, arrived immediately before the battle. The Milne Force was under the command of Major-General Cyril Clowes and this time we had sufficient troops under inspiring leadership, and the result was inevitable.

It is to our advantage that the enemy failed to appreciate sufficiently early the value of the Milne Bay in any air support of a naval action and as a pivot, whereas the imaginative and speedy action of G.H.Q. in forestalling the Japanese was of inestimable value in the subsequent operations.

The tide turned at the Battle of the Coral Sea, and began to ebb rapidly for the Japanese with defeats at Milne Bay and Kakoda.

Nevertheless, our hold on the northern shore and sea was precarious until the capture of Salamaua on the 12th September, Lae on the 16th September, and Finschafen on the 2nd October, all in 1943. To ensure more adequate communications to the northern outposts,

and particularly to Wau, a most important keypoint, something more permanent than an air line which was subject to enemy action and weather vicissitudes, was needed.

For this reason the C. in C. instructed investigations to be made into the possibility of road access from south to north. During the battle of the Kakoda trail an attempt had been made to cross the Owen Stanley Range by road, but the difficulties of the country and lack of time for investigation prevented its completion.

Early in July, 1942, as detailed later in this report, a commencement was made with reconnaissances into the possibility of connecting Wau to some suitable southern centre, and these investigations continued until the beginning of January, 1943, with no definite result or decision.

It was at this stage that the C.R.E., Milne Force, was instructed to take command of the project and to build a road suitable for the purposes of the C. in C. This forced him into the position of providing access with little more time at his disposal than had already been spent on reconnaissance. It was not an enviable position, as he was well aware that his recommendations to the C.E., N.G.F., must of necessity, be made, with inadequate information and with little or no knowledge of the success or failure of the task would be attributed to him alone.

An appreciation of the above information is necessary if the genesis and development of the road is to be understood.

1. — PREAMBLE

(i) The great, wide valley of the Bulolo River has a considerable strategic importance. It lies on the northern side of the Owen Stanley barrier and, though separated from the northern coast by the lesser but still rugged Kufer Range, it is not far from such northern bases as Lae and Salamaua. In peace times it had been developed considerably. The valley had been cleared in part and settled to work the rich gold deposits of Wau, Bulolo, and Edie Creek; and, away from the mining areas, there are extensive, undulating regions of Kunai grass, breaking the usual expanse of difficult rain forest. There were roads within the valley, there were bridges, machinery, houses and workshops; there were permanent water and electric power, food was abundant (fruit and vegetables), and there were aerodromes and sites within the Kunai that could be developed into others. The possession of this region was vital. But there were no roads to it.

Before this war no wheeled traffic had ever run into the valley. There were some rough, native pads known to some of the settlers; but all goods and rations, all merchandise, machinery and vehicles were flown there. Even the parts of the dredges used in the quest for gold were flown in, and awkward loads up to 5,000 pounds in weight were included.

Southwards was the enormous barrier of the Owen Stanley Range rising, in places, to 13,000 feet or more, and with few traversable gaps through it.

When Japan launched herself into war with America and the British Empire in December, 1941, and drove southwards with such rapid precision, the threat to Australia and contiguous islands became graphically apparent.

Women and children were evacuated from the Territory of New Guinea and Papua, and a military call-up was made throughout the Australian controlled areas of the island.

However, a considerable number of men unfit for military service were left in Edie Creek-Bulolo-Wau goldfields area. Civilian pilots, many of them flying nondescript patch-work planes, undertook their evacuation to Port Moresby; but as the Japanese became firmly established and spread their air force over the Territory it became too dangerous to fly unescorted. The hard-pressed R.A.A.F. was unable to supply fighters, and eventually banned the continuance of aerial evacuation. This left about 250 civilians stranded in the Wau area, with no means of getting to Port Moresby or any other place of safety without facing the hazards of unexplored and unmapped overland routes.

With the full realisation of their plight these people became very restless, and the majority were prepared to take the risks of unorganised treks overland to Port Moresby rather than sit idly and await certain capture by the invaders. Men laying claims to a certain knowledge of the country attempted to form small parties, but were met with official antagonism. It was felt that any unorganised venture could only meet with failure, and possible tragedy.

Officials who were carrying on the administration of the Territory began discussing tentative plans for evacuation to Port Moresby by the Waria River route, but on the 6th February, 1942, an alternative scheme was suggested. The intention was to follow a route from Wau to Motu Motu, by way of the Upper Bulolo

and Eloa Rivers, Kudjeru, Waterdry and Waterbung to Bulldog, where a civilian aerodrome was situated, and thence down the 80 winding miles of the Lakekamu to the sea. This plan was immediately accepted.

Information was sent to the administration of Papua and to Canberra with a request to provide food and sea transport for approximately 250 persons at the mouth of the Lakekamu River by 26th February, 1942.

Without waiting for a reply to this proposal, Deputy Administrator K.C. McMullen called District Officer N. Penglase, Surveyor G.E. Ballam, and Surveyor C.W.G. Fox into conference to arrange details. It was decided that Ballam and Fox, together with Carpenters W.H. Fleming and F. Cook and F. Munro-Leetch, who spoke Motuan (the basic tongue of Papua), should comprise a party to depart at the earliest possible moment for the purpose of locating and blazing the route to be followed and to locate and construct rough camps between Wau and Bulldog capable of housing 40 persons each. With 70 New Guinea native carriers and five New Guinea police boys, the party left Wau in the early morning of the 9th February, 1942, with 14 days rations.

The scheme was that other parties of carriers, under Government officials, should leave Wau each day, beginning three days after the departure of the locating party, and stock each camp with a day's supply for 250 persons, plus a small surplus, together with a quantity of native rations for carriers engaged. This arrangement was not effected and evacuees who used this route were obliged to carry their own rations and to supplement them from a dump established in the locality of Kudjeru by

civilian authorities a few weeks earlier. The balance of the journey from Bulldog to Motu Motu was to be completed by native canoes and rafts via the navigable waters of the Lakekamu River.

The successful evacuation of men considered unfit for military service directed the attention of the military authorities to the possibilities of the route, and on 28th March, 1942, it was decided to establish a line of communication.

On the 31st March, 1942, only three days later, a party of the 1st Reinforcement of 1st Aust. Ind. Coy., left Port Moresby in the schooner "Royal Endeavour" and made the overland journey to Wau to augment the New Guinea Volunteer Rifles who were keeping contact with the Japanese land forces which landed at Lae and Salamaua on the 8th March, 1942.

During April, 1942, a line of communication was consolidated by Major E. A. Stanfield and staff, acting under instructions of Major-General B.M. Morris. At that time there were rough camps at Bulldog, Dead Chinaman (so named because a Chinese died there during the evacuation), Fox Camp, House Karuka, Waterbung, Waterdry, and Kudjeru.

Travel was arduous along the muddy, rootmatted track, which rose to about 8,000 feet in the wild mountainous country between Waterbung and Kaisenik. Continual rain and enveloping cloud mists drearily contributed to the weariness of men climbing in the thinning atmosphere. The most difficult part of the journey was the one day stage between Waterbung and Waterdry, during which the track rose about 3,500 feet.

(ii) *Routes across New Guinea:*

The Commander in Chief (General Sir Thomas Blamey) was desirous of ascertaining a supply route from south to north of New Guinea to meet the threat from the Japanese movement down the north-east coast, and he considered the three possibilities of:

- (a) route to Wau and thence via existing roads to Sunshine; thence on to the Markham or to Salamaua, road locations to each of which had been surveyed under civil administration;
- (b) route from Port Moresby via Kokoda to link up with the vehicle track extending from Buna area in the direction of Wairope on the Kumusi River;
- (c) route through the lesser ranges at some place between Port Moresby and Milne Bay.

The Bulldo-Wau route offered the best prospects with the engineer resources available, and instructions were issued for its reconnaissance and development. Bulldog is an old mining settlement on the Lakekamu River, about 80 miles from its mouth. The stream is shallow, snag infested, tortuous, and swift.

(iii) *Bulldog-Wau Route:*

On the 3rd July, Capt. Vidgen, an officer of the Queensland M.R.C. in pre-war days, Lieut. Fox, Cpl. Swanson, and Spr. Cribb, with carriers travelled from Kudjeru to Bulldog via the Waru River. From thence to the south coast the Lakekamu River afforded a navigable waterway. Capt. Vidgen's report was forwarded to the C. in C., who directed continuance of the project on a mule

track to supply Wau (occupied by Kanga Force). On the 11th August, G.O.C. 1 Aust. Corps. (with B.G.S., C.E. and A/D.D.M.S.) arrived in New Guinea and assumed command of the New Guinea Force. Lieut. Fox conferred with Major-General Morris and the Chief Engineer (Brig. J.W. Main) and reported that the route from Wau to Kudjeru was already a mule track, that from Kudjeru for 20 miles southward the constructional difficulties were not great, as also the first ten miles north-eastward from Bulldog, that the intervening section was in very difficult country, but he thought it worth the effort to endeavour to locate a suitable connecting "shelf". The G.O.C. placed all engineer work in Port Moresby area and the route to Wau under the control of the Chief Engineer at this stage. Capt. Vidgen was interviewed at convalescent depot (recovering from malaria), and agreed with Lieut. Fox. Lieut. Fox was directed to return to Bulldog, and Lieut. Ecclestone, Sgt. Bannon and Cpl. Swanson to meet there, taking from Port Moresby engineer stores and supplies as necessary; and, obtaining natives at Bulldog, to reconnoitre the centre section of the Wau route from each end, at the same time organising natives for the construction of a mule track immediately it was ascertained the route was practical. Lieut. Fox arrived at Terapo (near Lakekamu River mouth) on the 16th August, and work was commenced towards the end of August. Reports to Chief Engineer by signal from Lieut. Fox were received between the middle and end of September indicating little likelihood of Waru River route being possible, and advocating Eloa River route. The Chief Engineer instructed Lieut. Fox to transfer to this route on which he commenced work on the 1st October. Reports from Lieut. Fox of difficulties, and mutilated signal reports, made the position very uncertain,

and the cessation of reconnaissance, pending conference with Lieut. Fox and his staff, was ordered. Lieut. Fox and Lieut. Ecclestone reported about 14th November, and the Chief Engineer and Lieut. Fox submitted details and recommendation to the C. in C. General Blamey directed that arrangements be made, in accordance with the information, for a jeep track to be constructed on the Eloa River route, to connect Bulldog with Wau.

Lieut. Fox and staff proceeded on the 9th December, 1942, to this site with a native force increased to 400 for commencement of work. At this time 1,000 natives were being used as carriers between Bulldog and Wau. On the 29th November, Brig. J. W. Main moved to the Buna area of operations, and Major Cantelo, of his staff carried out the organisation of preparations for the work. From the 16th January to the 30th August, 1943, Brig. Main was relieved by Brig. A. Torr as Chief Engineer, New Guinea Force.

(iv) *Construction of Jeep Track:*

In the meantime, Capt. J. W. Maynes had been placed in charge of the project and Lieut. Fox in charge of the construction.

Lieut. Fox and Sgt. Bannon began location work on the 10th December,

2. — GEOLOGICAL, GEOGRAPHICAL AND STRATEGICAL REASONS GOVERNING THE ROAD LOCATION

(i) *General:*

Pertinent aerial photographs were not available. The country is difficult to photograph from the air owing to the persistent mists that shroud it day after day. In addition, prior to the commencement of the task, planes had been limited in numbers and consequently overburdened with duties.

1942; Capt. Maynes arrived at Bulldog on Christmas Day, and during the next few days Lieut. Fox and he made an inspection of the proposed route as far as Waterdry, returning to Bulldog on New Year's Day.

Actual construction began in the first week of January, 1943, when ANGAU supervisors with about 450 native labourers began grubbing and clearing from the Bulldog end.

From that time, Lieut. Fox was engaged on location, assisted by Sgt. Bannon, and the location was continued as far as Fox Camp, about 18 miles from base.

Lieut.-Col. W. J. Reinhold, C.R.E., II Aust. Div. (A.I.F.), arrived at Bulldog from Milne Bay on the 10th January, 1943, and took control of all the activities concerning the road.

With Capt. Maynes, he left on the 12th January on an investigation of the route through to Wau via the Waterdry-Kudjeru location. This trip, occupying six days, was made over the existing carrier pad, a route which was ultimately rejected.

On or about the 5th February, Capt. Maynes returned to Bulldog. Lieut.-Col. Reinhold remained at Wau.

Shift had to be made without, and available maps were of little value. The popular and obvious route appeared to be that from Bulldog, up the Eloa River through Dead Chinaman. Fox's Camp, Centre Camp, Waterbung, Waterdry (the top of the range), Kudjeru, Blake's Camp, Kaisinik, Wau. This would cross the range at the lowest available point somewhere about 8,000 feet.

A very real strategical objection to this route was that it appeared to be rather exposed to enemy action based on Salamaua. This was proved to be correct in late January, 1943, when the Japanese cut the track from Wau to Kudjeru and reached the edge of the Wau strip before being thrown back.

In addition, an inspection gave the impression that the country was being fought, particularly on the south side of the main range, and that construction in the steep gorges leading to the Eloa would be difficult and terribly slow.

Rightly or wrongly, the C.R.E. decided that the job would not be done on this route within the time at his disposal, nor did this time permit the normal civilian procedure of comparative trial surveys over various routes that suggested possibilities. Lastly, but not least, an investigation had been made between Waterbung and Waterdry and an inspection of this did not suggest it as a satisfactory solution. A reconnaissance too, of the Korpera route, very promising on the map, had proved abortive at an earlier stage.

The following information was available:-

(a) There was a single track M.T. road from Wau to Edie Creek in steep country. The distance was about ten miles;

(b) South of Edie Creek a ridge ran towards the Koluron Mountains, and along this ridge a miner named Schrater had commenced to build a water race 16 miles long to divert water for sluicing purposes to the gold bearing grounds of Edie Creek which were at too high an altitude for the resources of that stream by gravitation;

(c) That the trend of the country was N.N.E. - S.S.W. from this point, at right angles to the main range and almost in a direct line to Bulldog;

(d) That a road in this direction would be well protected from enemy ground action.

It was surmised that construction would be easier and quicker higher on a water-shed than it would be in the gorges of the Eloa River. Thus it was decided that the success of the project depended upon a successful reconnaissance of this alternative route and that, preferably, the route should avoid the Eloa Gorge as much as possible and rejoin the river at Dead Chinaman when the country had flattened out, if this proved feasible.

The latter did not eventuate.

The country E. and S.E. of the Koluron Mountains towards the Eloa was unexplored and unknown and, apparently, tabu even to the Kukukukus. New Guinea is subject to frequent earth movement and the mountain country is unstable and landslides are common and often of great extent.

The shattered country that results from such earth movement aids rapid construction but entails heavy maintenance. Where time of construction is the major consideration, and where the necessity for a road, as in this case, would be probably of limited duration, ease and speed of construction became the governing feature.

(ii) *The Soils:*

Throughout the area, from the low-lying plains around Bulldog to the mossy forest above 8,000 feet, there is a thick mass of humas on the ground. It varies

from clay impregnated with decayed vegetation at the lower regions to almost pure dead moss at the heights. It varies also in depth from less than a foot to several feet thick. For road construction it is a nuisance, as it retains so much moisture.

Below this zone of the humas comes either solid rock or, more usually, a layer of clay weathered from the underlying rock. Many of these clays are extremely plastic and have proved to be difficult to stabilise. For example, a granite normally would weather to a soil with a great quantity of residual quartz. Yet over a great area of Schrater's Ridge the granite weathers to a bright yellow clay practically devoid of quartz.

Below the clay layer come the rocks, mainly schists and granites with a decayed rock zone of varying thickness between. Along Schrater's Ridge, which mainly is of granite, this subsoil is unusually deep, contrasting with the very fresh hard granite exposed in the Eloa Basin.

Over much of the route traversed in the lower Eloa, sands and gravels are abundant and were of great assistance to road making.

(iii) *Geographical Aspects:*

Most of the streams in narrow gorges and a N.N.E. - S.S.W. direction. The Wau valley is different. Here there is a wide valley, running N.W. - S.E. This appears to be a great trough of country let down between two parallel faults. East of Kudjeru the valley of the Korpera appears to be a continuation of this trough and forms the great gap across the Owen Stanleys that was the normal route of the planes from Port Moresby to Wau. The country here is wickedly steep, and an earlier road investigation had been abandoned as impracticable.

(iv) *The Relation of Geology and Geography to the Road Location.*

There were thus two types of route possible — valley route through the Eloa or Korpera Gorges into the Kudjeru trough, and the mountain route.

The valley routes do not involve climbing to such great heights. That is their chief advantage. The hard rock of the truncated spurs in the gorges is a deterrent to rapid work. Instead the road follows the mountain location, taking advantage of these almost unique structures that make it, in many ways, almost without parallel among mountain roads.

Beginning at Bulldog, the road traverses the valley tract of the Eloa River. This is simple enough, although here were some of the most difficult sections for soil stabilisation and great granite boulders had to be cleared out of the way. Thereafter, leaving the river above Centre Camp, it climbs as quickly as possible out of the Eloa gorge in a route that avoids the truncated spurs as far as possible, in order to reach those curious ledges and benches. This it does at Ban-non Lookout (33M).

While on the ledges road construction was favoured by these factors:-

(a) Gradients were easier;

(b) The rock, broken by horizontal shattering, came out easily with pick, shovel and bar, implements that alone were available in the middle section for many months;

(c) The old landslide material was arrested, and although benching into it often caused the slides to move again, this ledge structure did not allow for much of this slide material above the line.

However, the ledges, although so numerous, are neither very level, very regular nor continuous, and the road, consequently, gained its height by climbing from ledge to ledge. It is in those stretches between ledges, for the most part, that the very difficult rock cuts occurred — where the rock had not been shattered naturally and had to be blasted out with explosive.

Climbing thus the road reaches a little plateau between Ecclestone Saddle and

3. — RECONNAISSANCE

Early in January, 1943, the C.R.E., Milne Force or 11th Aust. Div. as it had been constituted was instructed to take command of the reconnaissance survey and construction of the proposed Bulldog Wau Road. The primary standard of construction was to be that necessary for jeep transport, but lending itself to later development into a M.T. road.

The military situation was such that a line of communication even if, in the early stages, suitable only as a graded carrier of mule track, was essential but it was desirable that such a track should be so located that it lent itself to future improvement into a road trackable for M.T. This entailed problems not raised in the earlier mule track investigations of 1942, and it required a wide appreciation of the location difficulties involved in the construction of a vehicular road.

On the 10th January the C.R.E., accompanied by Lieut. W. Crofts, arrived at Bulldog, and took over from Capt. J. W. Maynes. On the 12th January, Capt. Maynes and he left Bulldog for Wau, by the normal carrier pad, through Centre Camp, Waterdry and Kudjeru.

An examination of this route, and

Bulolo Spur, 44 to 46 M. in a fault zone along one of the heads of the Bulolo River. Here, with deficient drainage, the clays were deep and the moss thick and troublesome.

Finally, one advantage of the mountain route was that, from Johnson's Gap to Edie Creek, a distance of 11 miles, it incorporated relatively easy country along Schrater's Ridge and thence the existing single track M.T. road from Edie Creek to Wau.

particularly of the difficult section between Centre Camp, Waterdry and Kudjeru was not reassuring and the route appeared to fight the natural trend of the country, particularly between Waterbung and Waterdry. It was felt that construction would be long and difficult and that something more suitable would have to be found.

A study of the topography of the country, at the head waters of the Eloa, disclosed a range west of this river, centred about the Koluron Mountains and running in a regular S.S.W. direction forming the watershed of Watut, Indiw, Bulolo and Eloq Rivers. Joining the Kolurons to Edie Creek is a regular range, along which construction of a water race, 16 miles long, had been commenced by a miner named Schrater, and which had ceased on his death.

This combination led to the idea of a road loation which would follow rather than fight the country, and accordingly the C.R.E. went to Kaindi, adjacent to Edie Creek, on the 25th January, and walked with Lieut. Liecelejohn to Hidden Valley, at the head of the Schrater Race. There, on the 28th January, he was joined by Lieut. C. W. Ecclestone and W.O.

II (later Lieut.) C. K. Johnson, lent to him by ANGAU. On the 29th January, whilst the battle for Wau was reaching a climax in the valley below, the little party, less Littlejohn who had returned to his duties at Kaindi; pushed out into the uninhabited and unknown Koluron region.

There were 16 New Guinean boys of Johnson's, six Papuan boys of the C.R.E., and four New Guinea boys of Ecclestone's. There was no mapping information available. The general intention was to strike for a saddle east of Mount Koluron, which was known to Johnson, and was afterwards called Johnson Gap. The saddle is approximately 8,000 feet high.

The idea then was to follow the range S.S.W. from Johnson Gap along the eastern flank of the Koluron Mountains, directly to Bulldog. Ecclestone Saddle lies a little more than three miles S.S.W. of Johnson Gap but the existence of this saddle was unknown to the party until a high spur between it and Johnson Gap had been crossed. Between the two saddles lies the basin that forms part of the headwaters of the Bulolo River. It is steep country but it was deemed and proved suitable for road construction.

In traversing the country a direct line was taken west of south and obstacles were crossed and not avoided. Ecclestone Saddle, with a height above sea level of about 9,500 feet, is the key to the whole of the route. This point was reached on the 5th February and, in the distance, could be seen the Eloa Valley and a saddle, later known as Fox Saddle, an obvious control point.

The prospects were so promising and time so short that Ecclestone was instructed to arrange the survey of the route from Edie Creek to the saddle that was to bear his name. On the 6th February,

he and his natives returned to Kaindi for this purpose, and the remainder pushed on into the basin that forms part of the headwaters of the Eloa. The divide had been crossed.

On the 8th of February the two whites accompanied by three natives, climbed out of the Eloa gorges on to the ridge above Fox Saddle and scanned anxiously the rugged mountain side that led back to Ecclestone Saddle. It looked possible, provided that the hidden headwaters of the Eloa were not to formidable. Later investigations proved this to be a fact. The journey to the Eloa was an anxious one. Rations were running light and, without accurate knowledge, the directions was largely by guesswork. Bulldog was reached on 14th February, 1943.

It was almost certain that the country between Ecclestone and Fox Saddles had been traversed previously by white men, and it was avoided by the Kukukukus, the nomadic race of pigmy cannibals that are found more to the south and south-west. During the journey the natives showed remarkable courage and endurance and, at times carried heavy loads down cliffs ranging to 1,000 feet in height. The canyon of the Eloa is awe inspiring, about 50 feet in width at the bottom, with towering cliffs on either side and waterfalls jutting out on to the stream. It is a barrier that has to be seen to be believed. This stream was waded and steep detours were made up the precipitous sides to provide portage around waterfalls and rapids.

The natives never let up. The trip was a triumph for the ability of Keith Johnson and his knowledge of the natives, and the reconnaissance may be attributed to those factors.

The C.R.E. reported to New Guinea

Force at Port Moresby and the Koluron route was recommended and approved for construction. Thus have major decisions to be made when war calls the tune and the time that elapsed before definite information was available that this recommendation was justified was harassing and nerve wracking to a degree. But the risk had to be run and men put to work if the requirements of the C in C were to be met.

The C.R.E. retained this belief that the road should follow the ridge to the west of the Eloa. On the 15th February to investigate this two parties were formed, one consisting of Lieut. F. A. Smith, of the C.R.E.H.Q., and the C.R.E., the other of Capt. Maynes and Sgt. D. Leahy of ANGAU, each party with a line of Papuan natives. Following a ridge that run N.W. from the Eloa to a point S. W. of Fox Saddle, the former party went north to Fox Saddle, and the latter south along the main spur towards Bulldog.

The southern party was dogged with bad luck, and whilst crossing the Tivieri River, north of Bulldog, lost most of their belongings in that stream when a raft was overturned by an overhanging tree. They arrived at Bulldog on the 28th February in an exhausted condition having been without food for three days, except for two eels stolen from a Kukukuku cache. It is rarely that one steals from the Ku-ku's or, stealing, lives to tell the tale.

The northern party worked its way around the Little Wau system of creeks running into the western bank of the Eloa between Fox and Centre Camp. The country traversed was so formidable that it was decided to abandon the idea of following the ridge to the west of the Eloa and to connect Fox Saddle to Centre Camp. However, it is considered even to day, that if more time had been available,

the road would not have been brought back to the Eloa from Fox Saddle.

On the 27th February the northern party continued the task of investigating the Eloa basin between Fox and Ecclestone Saddles. Both Smith and the C.R.E. were sick with malaria, contracted at Milne Bay, and emphasised by the change to the bitterly cold climate of the rainy mountains. The job was heart-breaking. The weather was wet and misty and visibility was reduced to nothing and, before success was achieved, the C.R.E. was forced to return to Bulldog to report progress to N.G.F. H.Q. at Port Moresby. Smith, joined by Crofts, carried on under difficult circumstances. The native carriers, always fearsome of the stark cold, wet mountain regions, deserted in numbers. The ration position became acute. The dense growth and rugged country, over 9,000 feet in height made for slow and painful progress. The shifting of camp had to be done piecemeal. However on the 18th March, 1943, Ecclestone Saddle was reached and a camp established at that point, the result of dogged determination and self-sacrifice.

On the 24th March the C.R.E., accompanied by Lieut. J. H. Lavery, rejoined the party, having travelled by air to Wau and thence through Kaindi and Johnson Gap. Two further days of investigation enabled a reasonable route to be determined amongst the sheer rock faces and formidable ravines that form the sources of the Eloa. As the practicability of the whole route hinged on this discovery, and construction had commenced already from either end, the relief was great indeed and it was possible to advise the C.E. N.G.F. that the project was feasible just two months after the reconnaissance had commenced from Schrater's Race.

Meanwhile Fox, assisted by W.O.II.

R. Bannon, of ANGAU, continued the search for a connection between Fox Saddle and Centre Camp. The further this reconnaissance went to the S.W. the more difficult the creek gorges became. The Little Wau (an appropriate name) system of creeks is very difficult country for road building, and the route selected owes much to the genius of Bannon, an elderly New Guinea miner, who hit upon a turning point now known as Bannon's Lookout, to the N.W. of Centre Camp, and the road was run back in rough side-long country to the Eloa, north of Centre Camp.

It is to men such as Fox and Bannon, old New Guinea residents. Fox the mining warden at Wau, and Bannon on the field staff of Bulolo Dredging Co. in pre-war days, that so much is owed. They knew the type of country, they knew the natives, and they did not know the meaning of despair or defeat.

All that remained was the adjustment of the reconnaissance to the final location and work from Bulldog and Edie Creek was rapidly gaining momentum.

The route from Bulldog to Centre Camp, although apparent, needed close investigation to reduce construction difficulties inevitably many and tedious, to the minimum possible.

The exigencies of time and circumstance limited the survey to that of an approximate graded centre line, and even this was subject to change as construction proceeded. There was no time for the niceties of carefully prepared plans. Troops and natives were moved in and put to work. This was the chief reason why the route along the Eloa from Bull-

It is considered that the location as planned measures up to the military requirements reasonably well.

These could be assessed as:-

(a) Conformation with the Commander's intentions.

(b) Speed of construction that would render possible the plans of the Commander at the right time.

The economy of military roads must always measure up to these standards. A first-class job, built too late for the Commander's intentions, is of little use, whilst a road of much lower standard, produced in time, may have an incalculable value.

For this reason, the standards specified must be those that will do the job at the appointed time rather than a more elaborate programme destined to be too late for effective use. More often than not, in the mountain country of New Guinea, this result may be achieved only at the cost of future maintenance. At least the facilities to do this maintenance will be greater and time not so vital.

Decisions must be prompt and the risk of error accepted as inevitable. It is no place for the timid, and even the bold would have their nightmares.

4. - SURVEY

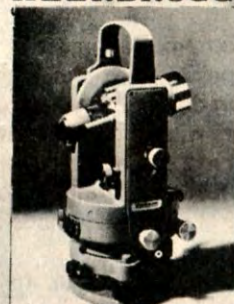
The dog to Centre Camp was adopted. Troops could be employed usefully as they arrived, whereas the investigation of a possible location to the west would have meant a hold up until its possibilities were assured.

The survey organisation was as follows:-

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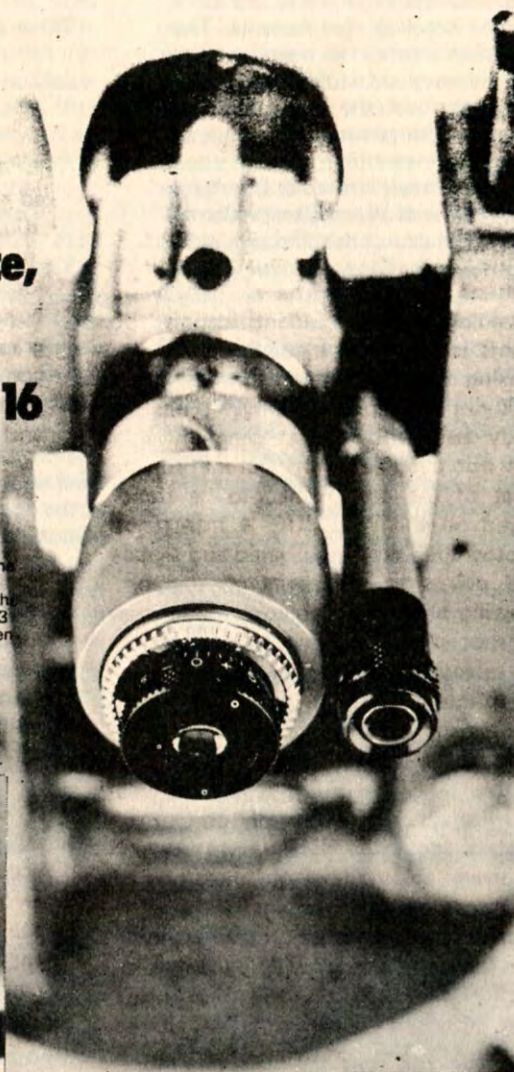
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- i. Lieut. Ecclestone, Edie Creek to Ecclestone Saddle.
- ii. Lieut Smith, Ecclestone Saddle to Fox Saddle.
- iii. Lieut Fox, Fox Saddle to Centre Camp.
- iv. The survey from Bulldog to Centre Camp was sufficiently far ahead for the immediate requirements, and Fox took up the completion of this when the line from his Saddle to the Eloa was sufficiently definite.

In the early stages it had been intended to fix a ruling gradient of 5 per cent, and a minimum curve radius of 80 feet. Subsequent investigation indicated that the route would be too long and entail too much construction, in difficult country, to permit of use quickly enough for the purpose. Military requirements governed the standards and a ruling gradient of 10 per cent, with a minimum radius of curvature of 50 feet were specified. The survey was resumed from Fox Saddle on 3rd March, 1943. The knowledge gained from the previous reconnaissance indicated that certain points had to govern the ultimate location. These were:-

- (a) The necessity of finding suitable crossings of the Centre Camp Creek at about 30 miles from Bulldog.
- (b) An exceedingly steep stretch of gorge along the right bank of Centre Camp Creek.
- (c) The extreme ruggedness of Thursday Creek.

It was decided during the course of the survey to make a turn on the watershed between Thursday Creek and Centre Camp Creek, thus bringing the road again across Centre Camp Creek, and thence

across the Eloa above Centre about 29½ miles and on the original Kudjeru - Bulldog trail.

The advantages to be gained by this manoeuvre were:-

- i. The elimination of heavy construction in the Thursday Creek basin.
- ii. It would make for greater facility in the delivery of supplies to parties engaged on road construction.

This procedure necessitates the negotiation of some extremely difficult country in the Eloa River gorge downstream from Centre Camp, but investigation showed that a practicable route was possible through this gorge with heavy rock cuttings in granite.

The Fox Saddle - Ecclestone Saddle (38 to 44 miles) section proved to be very difficult by reason of the steepness of the country at the head waters of the Eloa and the grade limits imposed by Fox and Ecclestone Saddles, together with other control points introduced by the many steep rock gorges and faces forming the sources of the river.

The general idea was to use the ledges mentioned earlier in this report. These ledges were not regular features and great care had to be exercised to use them to the best advantage and there was inevitable heavy rock work necessary in the connection from ledge to ledge as imposed by grade requirements. Some of this rock cutting was in hard granite, other in hard schist.

Lieuts. Smith, Lavery and Crofts were associated in this work, and all endured hardships and discomforts that would have discouraged men of lesser courage. The Ecclestone Saddle - Edie Creek (44

to 58 miles) survey was under the control of Lieut. Ecclestone assisted by Capt. Whitehouse, Lieuts. Haining and Nichols, and L/Cpl. Kerr. The survey was commenced on the 6th February, and completed on 12th April, 1943, except for minor adjustments.

Again a turning point was needed at about the 45 miles in the mossy forest to serve grade requirements, and heavy rock faces entailed the adjustment of the line to the best advantage between Bulolo Spur and Johnson Gap (45 - 47 miles) in steep country flanking the Kolurons and forming one of the sources of the Bulolo.

The mossy forest is grotesque. A gnarled mangrove like tree growth, in ground covered with moss sometimes six to seven feet thick, brought back childhood memories of Grimm's Fairy Tales, but there were no beautiful princesses. Literally, one walked on the spider roots feet above ground, and horizontal tree trunks, with fantastically twisted branches, in an eerie silence, made a scene that was peculiarly depressing and macabre.

There is little bird or animal life, the cold and wet, only a few degrees from the Equator, are continuous and intense and the saturated moss, as a sponge,

PERSONAL NOTES

Ian Sparks has been transferred to Arman & Larmer Jakarta Office where the bright lights of the Indonesian capital are at least on a par with what he has been used to at Kerema, Ihu and other Gulf hotspots.

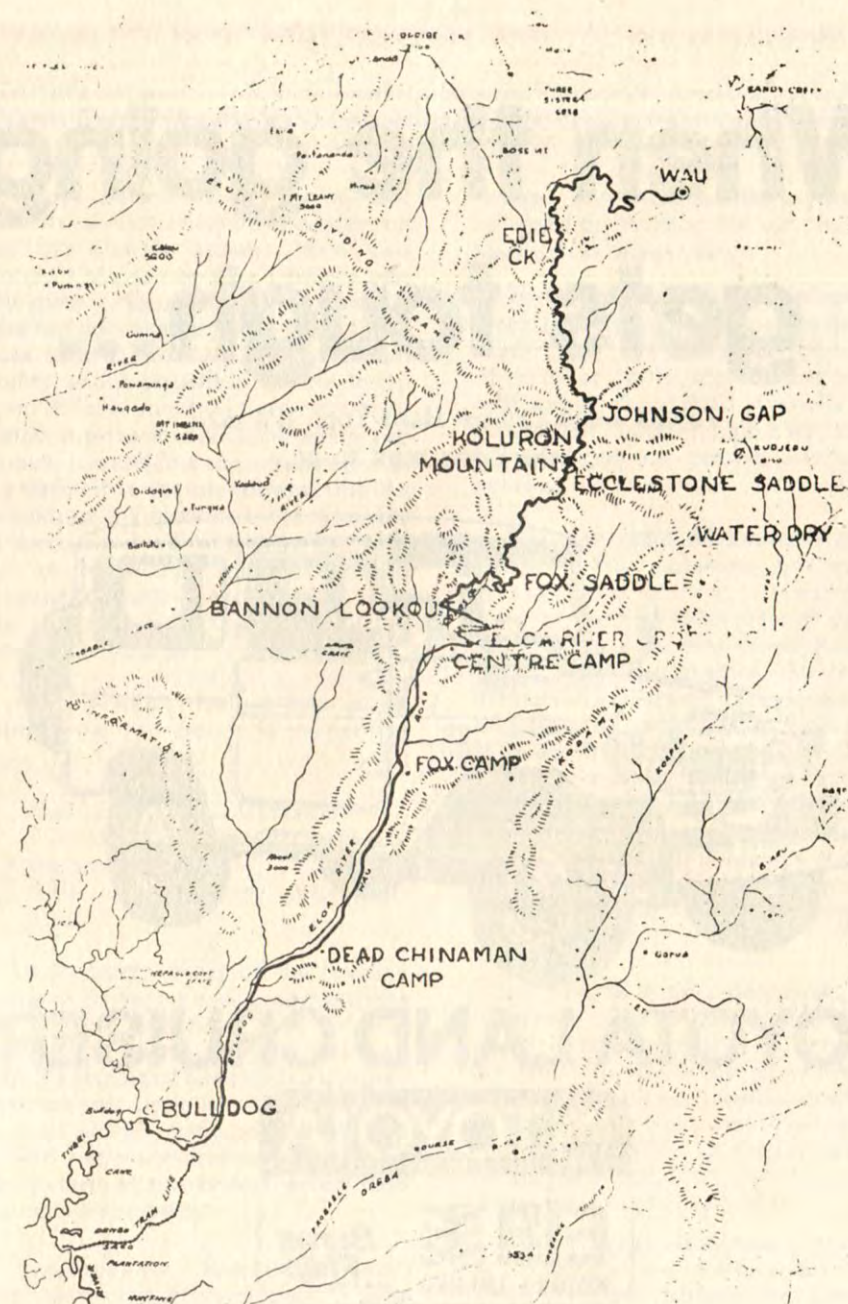
Tony & Sue Ferris decided to leave P.N.G. for a 12 month fact finding tour of Europe. They have since discovered a little Ferris is in the making and will now be away only 3 months.

collects and exudes moisture. And yet men camped under leaky tent flies and lived in these nightmarish surroundings for many months where, at 9,000 to 10,000 feet, wood was of poor burning quality, sodden and rotten, food consisted of hard rations, and the tea supply, affected by the damp, was always mouldy. Working nine hours a day, nearly always seven days a week, too little has been heard of the endurances and self-sacrifice that have shown what can be done by good men under the stress of an ideal.

The location of the road between Johnson Gap and Edie Creek (47 - 58 miles) required the selection of a route on either side of Schrater's Ridge. Out of Edie Creek, of golden fame, the line climbed on to the ridge and followed it to the best advantage often in steep country, but suitable for the purpose. Survey parties were supplied from either end, Bulldog or Wau, as circumstances permitted. A line of C.47 transport planes ran from Moresby to Wau, and thence supplies went to C.R.E. H.Q. at Edie Creek by road. Sea and river traffic transported supplies from Moresby 120 miles across the Gulf of Papua and 80 miles up the shallow, tortuous Lakekamu to Bulldog. From these focal points native carriers provided the link with the rapidly moving surveyors. (Cont'd next issue.)

Noel Sharp is committed to head for Australia about May. He will hopefully be able to return in August to give his paper on the Purari Control Survey at the forthcoming Congress.

Members will be sorry to hear that Graham Matheson was involved in a fairly serious car accident in Queensland. He is getting around ok however and says that his neck has never felt so good as it does now with the help of a piece of wire in it.



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FUTURE ROLES OF PROFESSIONAL AND TECHNICIAN SURVEYORS

Text of a talk given by Mr. W. D. Kennedy, Surveyor-General for Australia, to the First Annual General Meeting of the Association of Technician Surveyors held in Canberra on 4th October, 1975.

I have chosen the title for my talk with the aim of elevating discussion on the relationships between these two groups. I say this because I believe past and present discussions and arguments have not done justice to the issues. Questions such as exclusive areas of responsibility and membership of the Institution of Surveyors have frequently dominated communications between the two groups. I would like to see future thinking directed to the proposition that the two groups are partners in the discipline of surveyors. I will not, therefore, attempt to define their roles in terms of immutable relationships. Indeed, I hope that my talk will show how futile an exercise that can be.

It is necessary that we look at the roles of the two groups in the context of:-

- . their historical development.
- . their characteristics.
- . the present trends.
- . their complementary responsibilities.

Undoubtedly, most of the developments in Surveying have occurred in the last 30 years. This holds good for most countries including Australia. We have seen the impact of our national development on our discipline. The growth of air, road and rail traffic, communications mineral extraction and urbanisation are but a few of the factors which have influenced our growth.

Accompanying these developments have been remarkable changes in tech-

nology. They have exerted a powerful influence on the direction our discipline has taken in recent years.

These two factors have continued to force extensive changes in surveying education. We have seen the establishment of excellent degree, diploma and certificate courses throughout Australia. Our education in turn is having a very strong influence on our present and future policies.

The very rapid development of the discipline has expanded professional attitudes and activity. Concurrently, many of the traditional areas of professional activity assumed the characteristics of established practice. The growth of established practices has sponsored the emergence of the technician work force as an active partner to the professional. This is a continuing process and is a feature of most dynamic disciplines.

It is now possible to identify the professionals and the technicians by examining some of their important characteristics.

Let us look at the professional. He is recognised by his tertiary education which is both extensive and intensive. His tasks are intellectual in nature. His primary function is to provide knowledge to be applied for the benefit of society. Professionals should be the primary advocates of change. Their nature is to seek innovative answers to problems.

I turn now to the technician. He works at a lower level than the professional but above a skilled tradesman. He possesses

technical education at tertiary level with emphasis given to practical training. He must have an understanding of the principles applied to his work because it involves the application of established practices or techniques prescribed by professional technologists.

There is a further characteristic or distinction which exists today but is seldom discussed objectively, if at all. The professional dominates the managerial and entrepreneurial areas of the surveying discipline. The technician does not. This distinction will assume increasing importance in coming years and will promote some tension between the groups.

Future developments in the discipline will be fashioned by current trends. There will be a continued expansion of our technology in areas such as data gathering and processing, remote sensing, and satellite geodesy to name a few. Social trends will have a powerful influence. Issues such as urban renewal, decentralisation, environmental protection and land use will call for knowledge and experience which must be developed quickly.

These developments will affect our discipline in exacting and exciting ways. I say exacting because we have a very great responsibility to meet the challenges generated by changing technology and by community attitudes. I say exciting because they mean that our discipline will be dynamic — not dormant.

What, then must be done? We must be actively monitoring these changes to plan for our future. We must be constantly adapting our skills to meet the changes. Technological developments must be studied, assessed and, where necessary, applied. Our education must be adjusted to provide us with the knowledge we are to need. We must develop management

and business skills and apply them effectively and ethnically if we are to maintain or improve our levels of service to the community. We all have a responsibility for the training and development of our less experienced and used sensibly. This is a total role which is the concern of professional and technician alike.

Out of these developments, characteristics and responsibilities it is, therefore possible to outline the relationships between the two groups in a general way. The professional, through his education, training and experience has a role covering the entire discipline. At present, this overlaps with the role of the technician but it is likely to do so less in future. This is because the emphasis of the professional role will be directed to education the application of specialist skills, planning and management. Because of his commanding influence, particularly at present, he can be expected to dominate the management and employer positions for some time.

The technician will rapidly expand his work areas and increase his levels of responsibility as the discipline expands. In the shorter term, technicians will be needed in greater numbers than professionals. After this period, I would expect their proportions to remain fairly constant. At this stage we could expect to see technicians moving into management and employer roles.

To sum up, I believe that the respective responsibilities of the professional and technician will change as rapidly as the profession expands. The professional will, however, fashion the shape and direction of the discipline even though their relative numerical strength, compared to technicians, will drop from today's levels. The expansion of the technician work force will be rapid and will not stop below management and employer roles.

These adjustments must be accepted with good will by the two groups. The discipline is not something which can be divided in two. It is something which

INTERNATIONAL ASSOCIATION OF GEODESY

The 16th General Assembly of the International Union of Geodesy and Geophysics of which the International Association of Geodesy is one of the seven constituent associations, was held in Grenoble, France from 18th August to 6th September, 1975.

At the final Council Meeting it was resolved that the 17th General Assembly of IUGG would be held in Australia in 1979. The exact time and place has yet to be fixed but it will probably be held either in Melbourne, or less likely in Canberra,

will flourish if professionals and technicians develop a partnership based on the belief of community service, ethics and respect for each other's aspirations.

during one of the university vacations. About three thousand delegates usually attend, and a great deal of careful organisation will be necessary.

The Council of the International Association of Geodesy elected Professor P. V. Angus-Leppan to be Third Vice-President of the Association; Associate Professor R. S. Mather was advanced from Secretary to President of Section Five, Physical Interpretation; and Mr. A. G. Bomford was elected Secretary of Section One, Control Surveys.

THE SURVEYORS OF PAPUA

S. E. REILLY, QLD.

Abstract

This outline of survey activities in Papua (formerly British New Guinea) covers the period from Queensland's abortive annexation of South-East New Guinea in 1883, to the Japanese invasion and the suspension of civil administration in 1942. Most of the information is derived from the Territorial Annual Reports. These were not published during World War I, and were drastically curtailed in the post-war Depression, and the years 1914 - 1942 are not well documented.

Introduction

Surveying, never an easy occupation, was particularly arduous in Papua. Even the foothills of the massive central cordilla are usually rugged, and some of the world's largest swamps occupy large

areas of the coastal plains. The tropical heat and humidity make physical exertion unpleasant, the survey work is hampered by the heavy rainfall and exuberant vegetation. Malevolent insects, reptiles and parasites menace the surveyor's health and comfort, and few qualified for superannuation. The difficult terrain made the cost of road construction almost prohibitive, wheeled traffic was unknown except in the immediate vicinity of the few towns, and land travel was usually on foot, with native carriers for transport. Wherever possible movement was waterborne in canoes or whaleboats. Small coastal vessels carried mail and cargo at infrequent intervals, but many calls at open beaches or over treacherous river bars were missed in heavy weather. Even the *Papuan Chief* — the flagship of the

coastal fleet — was hardly luxurious; the acrid smell of copra permeated them all, and their limited accommodation swarmed with cockroaches. They were, however, the only link with civilisation, and the cry of "Sail-O" always stirred pleasant anticipations. Wireless stations at Port Moresby and Samarai maintained telegraphic communication with shipping and Australia, but in those days none of the coastal fleet carried radio equipment, and infrequent and irregular mails were the only means of communication. There were doctors and hospitals at Port Moresby and Samarai, and travelling medical officers (unqualified) made occasional patrols, but the surveyor usually had to rely on himself for the treatment of any accident or illnesses.

Land Policy

Land Policy was dominated by Erskine's promise to the natives that "evil-disposed men will not be able to occupy your country, to seize your lands or take you away from your homes." All land was native unless it had been legally acquired by the Crown. Only the Administrator could purchase native land if he was satisfied it was not required by the owners, and he could take possession of "waste and vacant land." The Lands Ordinance of 1890 provided for the issue of titles in fee simple, and for the registration of titles to real estate. "Deeds of Acquisition" were prepared for all Crown Land and registered by the Registrar General. Sale prices were 10/-, 5/- and 2/- an acre, for agricultural, coconut and pastoral land respectively, and £5 an acre for trading or fishing land. Unconditional leases were offered for not less than 1/- an acre per annum, and conditional leases were rent free for three years, with a minimum rent of 6d an acre per annum thereafter.

These liberal conditions failed to attr-

act settlers, despite extensive advertising, and only 190 grants had been issued by 1897, covering a total area of 6,574 acres. Three pastoral grants covered 1,467 acres, 18 agricultural grants covered 3,848 acres, and the balance were residential, trading or mission grants. In 1898 a British company — British New Guinea Syndicate — was prepared to undertake large scale agricultural operations, and the Executive Council passed an ordinance giving it the right to purchase 250,000 acres at 2/- an acre. The Queensland Government gave tentative approval, and Imperial sanction was sought from the Colonial Office, but the other Contributing Colonies opposed it, and the Australian press campaigned against it. The Colonial Office eventually disallowed it.

Rents were halved by the Lands Ordinance of 1899, and survey fees were based on a more moderate scale. The Papua Act in 1906 abolished granting or disposing of freehold estates, and this was incorporated in the Lands Ordinance of 1906. Instead, 99-year leases were offered of areas up to 10,000 acres, subject to improvement conditions. These were rent free for ten years, but subject to forfeiture if reasonable efforts were not made to fulfil the improvement conditions. For the balance of the lease, rents were reassessed at intervals of 20 years, not less than 5% of the unimproved value for agricultural land, and 2½% for pastoral land. There were no charges for survey, preparation or registration of the lease.

The Royal Commission of 1906, largely influenced by the evidence of the Chief Judicial Officer — J. H. P. (later Sir Hubert) Murray — was convinced that a vigorous policy of European settlement was needed, and recommended, *inter alia*:

1. Establishment of government

plantations.

2. Resumption of all unalienated native land.
3. Compulsory purchase of all land not needed by the natives.
4. Immediate purchase of all land which the natives are willing to sell.
5. In settled districts as proclaimed, natives to be compelled to mark off their land — all unmarked land to be declared Crown Land.

Most of these recommendations contravened Erskine's promises, and only the first was actually implemented. The Commonwealth Government granted annual loans of £5,000 for five years, and with further grants this sum was increased to £30,000. Two plantations were started — a rubber plantation of 277 acres at Kemp Welch River, and a coconut plantation of 1,000 acres at Orangerie Bay, both under the control of the Commissioner for Lands and Surveys, who, since 1907, was also Director of Agriculture. Both were successful, and the advances were repaid by 1928.

The generous conditions of the 1906 Ordinance started a land boom. The area leased increased from just over 2,000 acres to 337,803 acres by 1909. This was gratifying, but it was obvious that many leases were beyond the applicant's ability to fulfil the improvement conditions, i.e., approved cultivation of one-fifth in five years, two-fifths in ten years, and three-quarters in 20 years. It was estimated that about £2,500,000 would be needed to satisfy the improvement conditions on all the leases issued. The existing survey staff were unable to cope with this flood, and in 1909 an amended Lands Ordinance imposed deposits (refunded when improvement conditions were completed) on all large areas as a check on irresponsible applications. The rent free period was abolished for areas over

1,000 acres, and lessees were charged the actual cost of survey plus 15% for office and inspection costs, for all areas over 100 acres. By 1914 over 200,000 acres had reverted to the Crown, mostly for failure to carry out the statutory improvements. Five contract surveyors were employed, and by 30th June, 1914, they had surveyed 142,668 acres. The Chief Government Surveyor reported that "the surveys of the Territory are well in hand and the Department is in a position to deal expeditiously with all the leases granted. During the period of free surveys (1908 - 1910) the small boom in land applications found the survey staff quite inadequate to cope with the survey work, in spite of every effort to increase personnel."

The outbreak of World War I and the post-war Depression retarded expansion, and there were only minor changes in land policy.

Exploration and Topographic Surveys.

When MacGregor's term of office ended in 1898, he and John Cameron had mapped, with astronomic control, most of the coast and the major streams, and determined the coastal termination of the borders of the German and Dutch Territories. MacGregor's successors did not share his thirst for geographic knowledge, and, according to the Encyclopedia of Papua New Guinea, exploration in the twentieth century was usually undertaken by "the adventurous amateur either in the course of, or as a diversion from, administrative duties." Access to uncontrolled areas was restricted, and surveyors were not as prominent in New Guinea exploration as they were in Australia. Most exploration was by government patrol officers, who seldom were trained or equipped to make accurate maps of their travels. Their sketch-maps were the basis of most pre-war maps, and when New Guinea became a theatre of

war, considerable errors in position and elevation of major physical features made flying hazardous, and contributed to the heavy loss of aircraft from non-combat causes during operations in this area. Oil prospecting companies carried out topographic mapping from air photos, with astronomic control, in areas of geological interest, but the administration never had the funds or the staff for such activities, and was often hard pressed to keep pace with cadastral surveys, though some traverses were run to tie isolated cadastral surveys together.

The Early Surveyors

Most of the surveyors came from Australia and brought Australian methods with them. Before 1900 there was no Department of Lands and Surveys, but a few surveyors were in the Possession. John Cameron, who had surveyed the New South Wales/Queensland border in 1880-81, came to New Guinea in 1883 while on leave from the Trigonometrical Survey of New South Wales, and "bought" 15,000 acres of native land at Kabadi, in the Redscar Bay district. Two years later he resigned and came to New Guinea, where he was associated with MacGregor in surveys and explorations until his death in 1897. John Fredrick Mann, a New South Wales surveyor who had been with Leichhardt in 1846-47, represented the Royal Geographical Society when the Protectorate was proclaimed by Erskine at Port Moresby in 1884. Walter Cuthbertson, from South Australia, surveyed the townships of Granville East and Granville West, and a feature survey to the Laloki River in 1886. In 1887 he was the leader of the Royal Geographical Society's expedition to Mt. Obree in the Owen Stanley Range. John Hemmy, a Queensland staff surveyor, paid a brief visit in the same year. Theodore Bevan, a trader and beche-de-mer fisherman, persuaded the New South Wales Government to place a stream

launch at his disposal for exploration in New Guinea, and the Queensland Government sent Hemmy to verify Bevan's claims. He suffered sunstroke while in the Kikori delta, having very "imprudently" taken off his helmet on several occasions while using the theodolite or sextant."

MacGregor's Land Ordinance of 1889 ordained that "no land, unless it is an island, can be granted in fee simple until it has been surveyed by a licensed surveyor. Survey fees shall be paid by the grantee, and their amount is fixed by the Administrative Council."

He proposed in 1891 that all survey fees and other proceeds of land sales should be used to meet the costs of employing a surveyor. Although this was not approved by the Contributing Colonies, John Cobon, a Queensland surveyor, was appointed Government Surveyor on a salary of £450 per annum. This put such a strain on available revenue that nothing was left for contingencies, and the position was abolished in 1893. It was announced that "arrangements had been made for a duly qualified unofficial surveyor to carry our surveys." This was probably Cameron.

In 1895 MacGregor pointed out that the colony's future depended on its mineral and agricultural products, and these could not be developed without surveys. He therefore proposed to appoint a surveyor to select and "roughly survey" blocks suitable for agriculture, which could be offered to selectors on payment of the survey fees. He asked for a grant of £1,000, since experience with Cobon had shown that surveys could not be financed from normal revenue. This was approved and Cameron was appointed as Government Surveyor in October 1896. He selected and roughly surveyed about

30,000 acres on the south coast before his death in December, 1897. Henry Stuart Russell, his successor, arrived in Port Moresby with his assistant, Frank Wearne, in February, 1898. In the same year MacGregor selected a Queensland Surveyor, William MacKay, as his private secretary. There must have been another surveyor in the colony, for the Annual Report for the year ending 30th June, 1899, said "there was at present another surveyor who resides at Samarai."

The Department of Lands and Surveys

Le Hunte, MacGregor's successor placed, £500 on his estimates for the year ending 30th June, 1900, for a "properly organised survey department," and £500 for a Lands and Survey Office. This was at that time lodged "in a corner of the small ill-lit Government Offices, in a shaky verandah room, which is quite unsuited and insufficient for the purpose. It is intended to erect a separate wooden building."

This was apparently built in Douglas Street. At some time prior to 1929 the Department moved into a wooden building in Upper Cuthbertson Street. It became the residence of Judge Gore when the Government Offices moved to Konedobu after 1945. Henry Stuart Russell was the first Chief Government Surveyor and Commissioner for Lands, and when the Department was made responsible for Works and Mines the title of Director of Works and Mines was added. In his first Annual Report he said . . . "a separate department for dealing with affairs in connection with the survey and general administration of the Possession was not definitely organised until late in the year . . . An unsuccessful attempt was made to enlist the services of contract surveyors from Australia; but it is hoped that before the end of the present year we shall have five or

six Government surveyors added to the staff . . ."

The Surveyors' Institution of British New Guinea

This hope was realised in November, 1900 when five Queensland surveyors, W. J. Callendar, E. J. MacDonald, E. S. Tooth, D. Rutherland and E. W. Cross, selected by the Surveyor-General of Queensland, arrived at Port Moresby. A New South Wales staff surveyor, John Richmond, was appointed Chief Draftsman. Another Queensland surveyor, Herbert Maguire, was employed on contract surveys in the North East Division. This influx of surveyors led to the formation of The Surveyors' Institution of British New Guinea in 1901, with Russell as President and Richmond as Secretary. No record of its activities has been found, and it probably collapsed in 1902 when membership was reduced by Russell's transfer to "another colony" (unnamed), and the resignations of Cross and MacDonnell. Richmond became Chief Government Surveyor, and Edgar Matthews, a Queensland Surveyor succeeded him as Chief Draftsman.

The Australia/New Guinea Border

When the Australian States federated in 1901, authority over the affairs of British New Guinea was transferred to the Governor-General, but this did not become effective until the Papua Act was proclaimed in 1906, and the Crown Colony of British New Guinea became the Australian Territory of Papua. This was the indirect cause of the failure to finalise the amendment of the Australia/New Guinea border, which is only a few hundred yards from the latter's shores in places. When the Tugeri headhunters eluded MacGregor in 1896 by taking refuge in Queensland waters he proposed a more equitable boundary, after some time surveying among the reefs and

islands of Torres Strait. After some amendment this was accepted by Queensland and ratified by an Imperial Order-in-Council. The Queensland Premier promised to confirm it by legislation, but nothing was done because of the unstable political situation, despite reminders from Le Hunte. Plans for the federation of the States were well advanced, and in 1901 Le Hunte was informed that the border was now a Federal matter, and commented in his Annual Report:-

"The long unfulfilled promise of the Queensland Government . . . still stands as an inequitable, arbitrary, and purely unnecessary injustice to the Possession."

At the time there probably seemed no urgency for the change, but what was then an unimportant internal boundary, is now an international maritime frontier, only a "bowshot" from the shores of New Guinea. In 1966 van der Veur said it was an "anachronism which contains the seeds of future conflict." Repeated procrastination has made a relatively simple problem a very difficult one, with legal, constitutional, political and social complications.

Richmond's Suspension

In 1904 the Acting Administrator, Judge Robinson, was recalled to Melbourne for a judicial inquiry into the massacre of sixty Goaribaris by an expedition to arrest the murderers of Chalmers and Tomkins in 1901. This drove him to commit suicide in front of Government House in Port Moresby. Captain Barton, who had come to the Colony as Le Hunte's private secretary, succeeded him in June, 1904. This superseded several senior officers and added to the discontent of the Public Service. Relations between the Administrator and the Department of Lands and Survey were far from cor-

dial. The Chief Judicial Officer J. H. P. (later Sir Hubert) Murray, who had been asked by the Prime Minister for a confidential report on conditions in British New Guinea, told him in 1906 that "strained relations have for some time existed between the Administrator and the Department of Lands, and his Excellency has appeared to entertain rather bitter feelings against all the officers of the Department . . . There is an impression amongst these officers that the Lands Office has been continually snubbed and thwarted by the Administrator, and has generally been treated as some sort of a Cinderella among Departments . . ."

Friction between Barton and Richmond came to a head in 1905 when Richmond accused Barton of wilfully altering an official document, and charged him with "dishonorable conduct and misuse of his powers." Richmond's suspension was confirmed by the Executive Council and referred to the Governor-General. On 26th January, 1906, the Board of Enquiry (Messrs. McLachlan, Allen and Garran) found Richmond's charges unjustified, and his language injudicious and insubordinate. The Secretary for External Affairs recommended his dismissal, but he was retained with reduced status, probably because of Murray's support, who told Deakin that "Mr. Richmond is a man of very retiring disposition . . . I believe him to be a singularly conscientious man and one who is guided by the highest principles . . . He considered the Administrator had behaved dishonorably and, therefore, felt he was bound to say so . . ."

Richmond was transferred to field duties as a staff surveyor, and resigned in 1909.

The Royal Commission of 1906

Atlee Hunt, Secretary for External Affairs, visited the colony in 1905 and reported that it was at a "standstill." He blamed the "suspense occasioned by the delay in passing the Papua Bill by the Federal Parliament", which had left the administration without direction on many matters and seriously affected the morale and discipline of the Public Service. At the same time European settlers felt that Barton showed undue concern for native welfare. Murray's report to Deakin said, "Constant bickerings and petty jealousies are no doubt unavoidable in a small community . . . but the discord which prevails at present is much more than this . . . and has been embittered by personal quarrels and individual jealousies . . . It is hardly an exaggeration to say that Captain Barton's administration is about as unsatisfactory as possible . . . His sympathy with the natives, unfortunately, leads Captain Barton into a policy which I can best describe as a policy of 'passive resistance' to white settlement . . . The great hindrance to settlement in the past has been, not so much that rents were too high, tenures too short, and survey fees excessive, as that it was impossible to get an application for land attended to within many months — sometimes years . . . The result is that B.N.G. has, as regards land matters, acquired a bad reputation. Captain Barton has certain defects of character which are absolutely

fatal to any prospect of fair administration and have accentuated the feeling of mistrust and uneasiness which prevails throughout the service . . ."

Reports in the Australian press suggested that things were far from well in the Colony, and in July, 1906, Barton, alarmed by rumours that MacGregor might come back, asked for the appointment of a Royal Commission to investigate conditions and recommend a policy for the future. In the following month Colonel McKay, Mr. Parry-Okeden and Mr. Justice Herbert were appointed and arrived in Port Moresby in September. One of the principal witnesses was Murray, who only needed to "refrain from committing perjury" to damn Barton. Barton's dismissal was recommended, and the Australian Government decided that he should take a year's leave and retire. Their other feelings — that native interests should be subordinated to those of the white settlers — have already been mentioned. Murray, who was on leave in Melbourne, was appointed Acting Administrator, with Deakin's assurance that when a Lieutenant-Governor was appointed the position would be his. His reception in Port Moresby at Easter, 1907, was rather cool, for some thought his evidence to the Commission was influenced by hopes of getting Barton's position. (Cont'd. next issue.)

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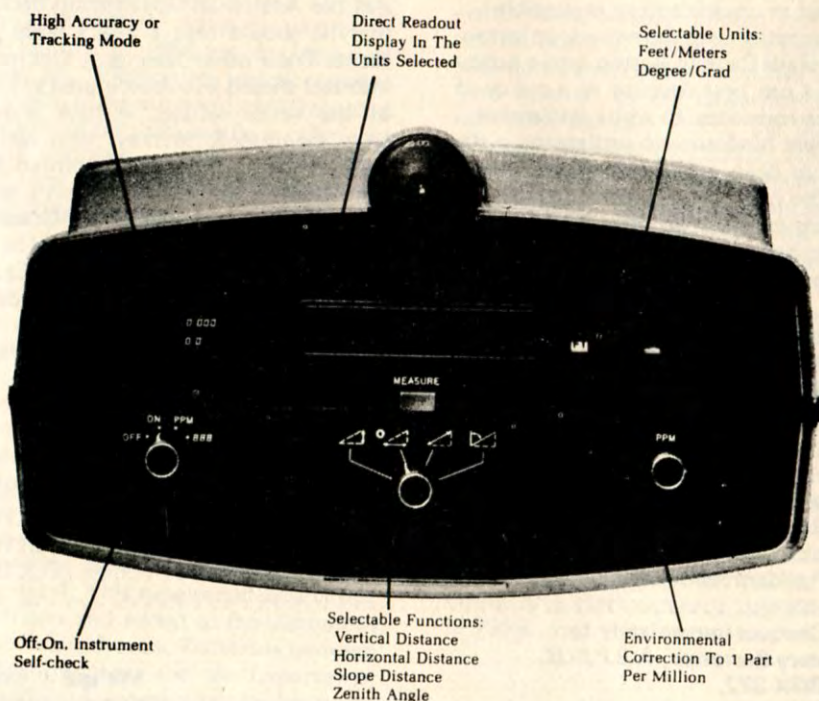
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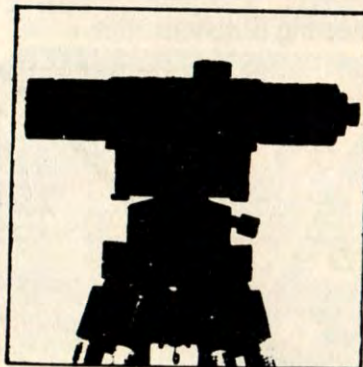
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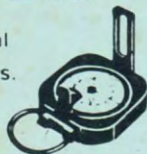


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