THE JOURNAL

of the

Association of Surveyors

of Papua New Guinea

VOL. 11 SEPTEMBER AND DECEMBER 1982 NOS. 3 & 4

THE ASSOCIATION OF SURVEYORS
OF PAPUA NEW GUINEA

OFFICE BEARERS 1982 - 1983

PRESIDENT

S. Palanga

HONORARY SECRETARY/TREASURER

C. Bassett

COUNCILLORS

F. Posanau
S. Pamela
W. Mitchell
S. Low
D. McNee
N. Leet
A. Bale

ROLL OF PAST PRESIDENTS

1960-62	C.W. Sparkes - Carroll	1971-72	K.St.C.Matheson
1962-64	R.G. Matheson	1972-73	M.J. Larmer
1964-65	O.G.G. Dent	1973-74	J.J. Garrett
1965-66	T.W. Richards	1974-75	B.J. Mennis
1966-67	J.C. Williams	1975-76	J.J. Tierney
1967-69	T.C. Jackson	1976-77	A. Bale
1969-70	T.W. Williams	1977-78	F. Posanau
1970-71	J.C. Macartney	1978-82	S. Low

Please address all communications to the:

Hon. Secretary
Association of Surveyors of Papua New Guinea
P.O. BOX 1422
BOROKO.

THE JOURNAL
OF
THE ASSOCIATION OF SURVEYORS OF PAPUA NEW GUINEA

VOL.12 NO.1

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Sub Editor: T.M.NACINO

CONTENTS.

THE ASSOCIATION OF SURVEYORS
OF
PAPUA NEW GUINEA

P.O. BOX 793
LAE, PNG.

Minutes of the 142nd Council Meeting held in Port Moresby on 18th August, 1982.

Present:	S. Low	President
	J. Sipuman	Secretary/Treasurer
	B. Mennis	Councillor
	D. McNee	"
	G. Wai	"
	C. Bassett	"
	S. Palanga	"

The last Council Meeting 1981/82 was held at the lunch hour at the Papuan Hotel on Wednesday the 18th August 1982. The Meeting was chaired by the President of the Association, Steve Low.

1.0 Matters Arising from the Previous Meeting.

Brian Mennis moved that the Minutes of the 141st Council Meeting be accepted.

Seconder: Clive Bassett
.....Carried.

The Secretary pointed out that after the 31st of May 1982, the four members, L.Tabua, P.Breria, D. Forster and R. Gurao had paid in full/partial subscription Fee. The President suggested the four members whose names have been stuck off the Register should be reinstated as they have paid their subscription fee. This was followed by the motion from Steve Low to allow the four members, L.Tabua, P.Breria, D.Forster and R.Gurao to continue their membership with the Association of Surveyors of PNG.

Seconder: Clive Bassett
.....Carried.

2.0 Electrion of the Councillors.

There was much discussion on the validity of Nomination to the Council as two members Norm Leet and Brian Mennis whose names appear as candidates, were not aware of being nominated. However, they accepted the nomination as candidates to the council for 1982/83.

Brian Mennis questioned the validity of the Councillors who have been nominated for the coming year as the ballot papers were not been sent to the overseas members. By rights, all members are entitled to vote for the Councillors of the Association. At this point of discussion, the meeting was adjourned until 4.00 p.m.

The Meeting resumed after 4.00 p.m., to discuss further on the Election of new Council Members. It was debated as there appear to be misunderstanding on the Election Technicalities. Despite misunderstanding in a section of the By-Laws, the overall election procedures were conducted according to the Constitution.

Skerry Palanga moved that the Election of the Councillors for the 1982/83 be accepted.

Seconder: Jerry Sipuman
.....Carried.

The 1982/83 Council Members were elected in the following order:

1. Steve Low
2. Brian Mennis
3. Pomaleu Salaiau
4. Alan Bale
5. Skerry Palanga
6. Norm Leet
7. Clive Bassett
8. Bill Mitchell
9. Francis Posanau

The other four candidates who were unsuccessful and are listed in order of vote priority:

10. Des McNee
11. Lionel Paisawa
12. Kila Ranu
13. Gairo Wai

3.0 Application for Membership.

Applications were received from Madu Sawaime and Kevin McConnell.
Des McNee moved that both applicants be accepted.

Seconder: Steve Low.
..... Carried.

4.0 Any other Business.

Clive Bassett suggested that the Council should look for alternative ways to improve the image of the Journal. The Journal has been on a decline for the last couple of years and perhaps the newsletter type be adopted to save printing cost. The bulk of the expenses is the printing cost and adopting a newletter type would perhaps be worthwhile in the long run. However, the majority of the Council Members agreed to adopt the Journal format as this would be the only communication with the majority of our members, the overseas.

Jerry Sipuman in a letter to the President asked for assistance to attend the Annual Congress. It was only his airfare that was paid for by the University and any other expenses be left to his own initiative.

Steve Low moved that K120.00 or equivalent to a return airfare be paid to assist him meeting the Congress attendance fee and private accommodation.

Also Jerry Sipuman showed the receipt of K82.00 for the new ten copies of self-carbon receipt book which was printed by New Guinea News Printing be refunded.

Des McNee moved that the sum of K202.00 be refunded to Jerry Sipuman be accepted.

Seconder: Clive Bassett
.....Carried.

Meeting closed 5.15 p.m.

JERRY SIPUMAN
HON.SECRETARY/TREASURER.

Congress Report

The 1982 Congress was held at the Papuan Hotel in Port Moresby. Due to increase costs and a reduction in the anticipated number of delegates, the number of functions were reduced as well as the actual number of technical sessions. The opening was held on the Monday evening, and moved directly into the Presidents Cocktail Party. Five half-day technical sessions followed and a summing up session on Thursday afternoon with the Annual Dinner held on that evening. The Annual General Meeting was held on the Friday morning.

As things turned out the number of delegates was more than expected and the finances show an unanticipated profit.

Delegates came from all over the country and quite a number from overseas. Some of our distinguished guests were Mr Jacob Rice, Director of Cadastral Surveys in Indonesia. He was accompanied by other members from his country on the border committee. Two past presidents of our association, Mr John Macartney and Mr Jeff Tierney and the Deputy Surveyor General of Queensland Mr John Gridland.

We thank all our overseas visitors for their attendance and hope their stay here was a enjoyable one.

All the technical sessions were well attended and judging by the number of questions at the end of each paper were very interesting and well received. All papers were well presented with two coming from our overseas guests namely Mr John Gridland and Mr Jacob Rice.

The two social functions were also held at the Papuan Hotel. Each was well attended and all involved appeared to enjoy themselves.

The Association wishes to thank all those involved in the organisation of the Congress particularly the Congress Manager Mr Brian Mennis and we hope to see you all in Lae at the 1983 Congress..

Opening the Congress the then President Mr Steven Low.

Some of the delegates enjoying the Cocktail Party, Mrs Macartney, Steve Low, Dianne Larmer, John Macartney and Mrs Rosa Low.

What can she see that the boys cant.

Enjoying the annual get-to-gether Adelbert Alois, Jerry Sipuman, Neil Pullar and Pomaleu Salaiau.

What! The beers off?
Jeff Tierney, Alan Dunnley, Sherry Palanga and Rodger Dwyer seem to be saying.

Oddity:

Recently in a well known watering hole somewhere in the Western Province, 2 surveyors were overhead while taking in a few brownies after a tiring day in the hot sun. The first (we shall call him Jeff) said to his mate (who we'll call Bill) "I'll bet you K10 that I can put my tongue in my ear". With much ballyhoo and cries of freek and wirdo the bet was accepted.

Jeff immediately took off him boot (causing much discomfort to fellow patrons) and put the roled tongue thereof in his ear. After much booing of cries of cheat the debt was paid.

A few more greenies were consumed (the brownies had run dry) and Bill said to Jeff "I'll bet you K20 (hic) that I can bite my own ear, hic..."

This was too much for Jeff and he immediately placed his K20 on the table to see this amazing spectale Bill quitely removed his false teeth and bit his ear.

****

PEOPLING THE PACIFIC (part 2)

by P. S. Bellwood

By this time - that is some 5,000 years ago - Austronesian-speaking colonists were probably on the move eastward, establishing footholds on the northern cost of New Guinea and in the neighboring Admiralty, Bismarck and Solomon islands. Here their reception was quite different from the one they had met in mvoing south, which bring us back to the subject of why the Mongoloid populations had so little genetic impact on Melanesia.

POLYNESIAN TEMPLE PLATFORM built in 1767 was seen by the naturalist Joseph Banks during Captain Cook's visit to Tahiti two years later. Banks described it as "a most enormous pile" and declared that its "size and workmanship almost exceeds belief." When this sketch was made in 1799 the platform was 10 steps high; today all that remains is a part of the foundation.

For some time scholars have wondered by Melanesia did not become simply a racial and cultural extension of Indonesia. The progress of the Austronesian colonists might have been slowed by their encounter with malaria, particularly if this parasitic desease was as devastating in Melanesia then as it was until quite recently. A more likely explanation, however, is that the long established residents in particular those of New Guinea, may have been able to hold out against the newcomers. Key information in support of this view has recently been supplied by archaeological work in the malaria-free New Guinea highlands near Mount Hagen.

Archaeologists from the Australian National University have found that beginning at least 6,000 years ago and perhaps as early as 9,000 years ago large areas of highland swamp in New Guinea were being drained by quite elaborate systems of ditches. The implications is that the drainage was undertaken to promote horticulture (perhaps the cultivation of taro, although the plant is not known to have been indigenous to New Guinea). This new discovery in the highlands raises numerous questions that are under active exploration. At present it is only possible to point out that horticulture of some kind was practised in highland New Guinea before, on the basis of any reasonable estimate, there was contact between the Melanesians and the horticulturist Austronesians. Indeed, the Austronesians never did reach the New Guinea highlands.

The implications of early horticulture in Melanesia are great. It is possible to hypothesize that the Melanesians of New Guinea (and probably those of New Ireland, New Britain and Solomons) had become large, fairly sedentary populations sustained by horticulture most than 5,000 years ago. If future archaeological work supports this hypothesis, then the failure of the Austronesian-speakers to overrun Melanesia may be attributable to their not having the numerical and economic superiority they had once had over the scattered hunter-gatherers of island South East Asia. There would have been a standoff between two Neolithic cultures.

The past 5,000 years of prehistory in western Melanesia brought about a degree of cultural, genetic and linguistic complexity that is unparalleled in the Pacific and perhaps in the world. Hundreds of discrete Papuan and Austronesian languages interdigitate as far east as Santa Cruz. Most of them are spoken only in a small area, perhaps in a single valley. Genetic diversity is also enormous and it is not correlated in any obvious way with the linguistic diversity.

Why should Melanesia be so different? One may perhaps get some answers by reconstructing the prehistory of those crucial past 5,000 years. The earliest evidence for Austronesian-speaking settlers in Melanesia comes from linguistic analysis. There is no coherent archaeological evidence of their presence before the appearance all across Melanesia of the pottery-making Lapita culture (names after the type site in New Caledonia) between 3,500 and 3,000 years ago. But by at least a millennium earlier, according to linguistic reconstructions, Austronesian-speakers had already moved into coastal locations in western Melanesia, where during an ensuing period of isolation from their Indonesian base they developed a number of linguistic peculiarities that today characterize the languages of the eastern Austronesian group. For example, the languages of eastern Micronesia and Polynesia are believed to stem from his earlier matrix in western Melanesia, rather than being transferred directly to those islands from Indonesia or the Philippines.

As for prehistoric social and economic developments in Melanesia, if an initial assumption can be made, the records both of archaeology and of recent ethnography provide some guidance. The necessary assumptions is that Melanesian societies in prehistory were no more complex, particularly with respect to political integration, than they are today. If this was the case, then I suggest that the initial hunter-gatherer populations of New Guinea were organized into fairly mobile bands, each consisting of a few families, for at least the first 20,000 years of their residence. Up until the recent past such social systems were characteristic of the aboriginal peoples of Australia and the Philippines.

The next prehistoric phase would have been the initiation of horticulture in New Guinea and perhaps in adjacent islands. Along with horticulture would have come settlement into more or less permanent villages adjacent to the garden areas. As mobility became limited, the Melanesian ethnographic pattern, in which ethnic groups occupy small areas and tend to marry within them , came into existence.

Among these ethnic groups leadership is rarely hereditary. It is usually acquired in adult life by individuals, so-called big men, who are able to build up advantages over their fellow tribesmen in wealth and prestige. Until the recent past active hostilities between geographically restricted groups were frequent. If such has been the social pattern in Melanesia for 5,000 years, it is not difficult to see how genetic, linguistic and societal diversity arose. In recent times peaceful contacts between groupd depended on shifting alliances, cemented by occasions of ceremonial feasting and by elaborate and often extensive trading activities. In areas of high population density the trade networks often developed into systems of great ritual complexity. At the time of the first contact with Europeans the Melanesians were the businessmen and traders of the Pacific. In this sense they were quite different from the Polynesians and many of the Micronesians, who formed ethnic groups geographically,far more wide-spread, whose societies were characterized by systems of inherited leadership and for whom trading by individuals was usually subordinated to patterns of communal tribute or of redistribution that were focused on chiefly leaders.

Such, it seems likely, was the prevailing social and ethnic pattern in Melanesia when the first Austronesian colonists arrived. The newcomers were unable to impose their own order on Melanesia; their settlements simply increased the diversity in the region. By about 4,000 years ago cultures of the indigenous Melanesian kind had been planted as far away as New Caledonia and the New Hebrides.

It is even possible that these last two areas had been colonized by Melanesians well before the first Austronesian-speakers appeared, although clear archaeological evidence for it is lacking. Meanwhile elsewhere in the western Pacific, western Micronesia may have been settled by Austronesian-speakers moving directly from the Philippines. The extended archipelagos of eastern Micronesia, of Fiji and of all Polynesia, however, still awaited their first human settlers.

The prehistory of Oceania now reaches its most remarkable and most expansive phase. About 3,500 years ago in western Melanesia representatives of the Lapita culture had established themselves, perhaps in the vicinity of the Bismark Archipelago, where their distinctive stamped and incised pottery has been found. This population may have entered the area not long before, coming perhaps from eastern Indonesia or from the Philippines. So far there is no archaeological evidence on the precise point of origin of the Lapita culture, and it may even be that the characteristics that distinguish Lapita pottery actually evolved within Melanesia.

Whatever its origin, the new population did not make extensive genetic or cultural contact with the neighboring Melanesias. Instead, as the presence of Lapita pottery at coastal and offshore island sites makes clear, the Lapita people over the next 500 years went on to colonize Tonga and Samoa, some 5,000 kilometers away in the central Pacific. The Polynesians had at last arrived in Polynesia.

So, perhaps, had the eastern Micronesians arrived in their area, although the absence of true Lapita pottery in those clayless atolls makes that part of the story hard to read. Where archaeological facts are absent, however, the linguistic evidence is suggestive. The languages of Fiji, of Polynesia as a whole and of the archipelagos of eastern Micronesia the Caroline, the Marshall and the Gilbert islands (now Kiribati, an independent member of the British Commonwealth)- all have a common immediate origin within the Austronesian family of languages. Hence there seems little doubt that the colonizers of eastern Micronesia were also bearers of the Lapita culture.

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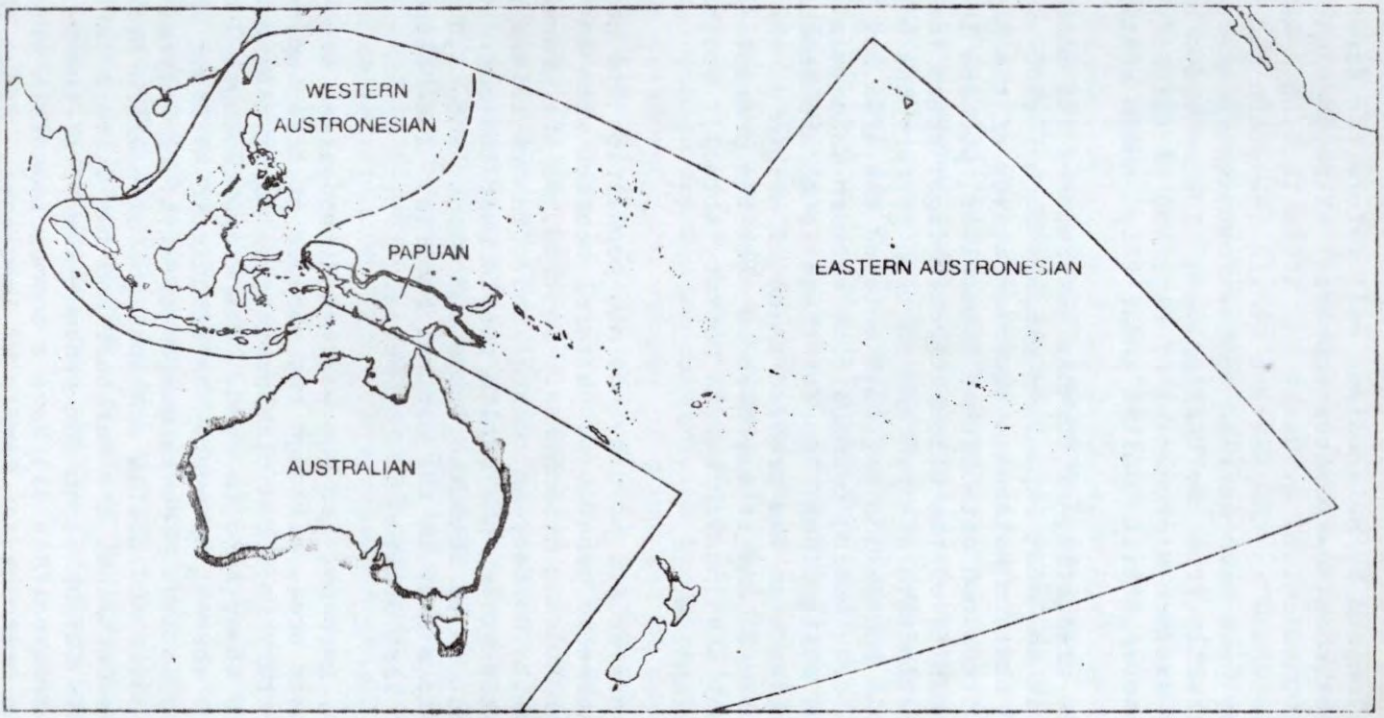


LINGUISTIC DIVISIONS of the Pacific and island Southeast Asia are twofold. Languages of the Austronesian family are found from Taiwan, a presumed proto-Austronesian locale some 6,000 years ago, southward through island Southeast Asia and the Malay Peninsula and western Micronesia; these languages comprise the western Austronesian half of the family. Elsewhere in Micronesia, throughout Polynesia and in parts of Melanesia are found languages of the eastern Austronesian half of the family. The second family of languages is Papuan, a highly diversified grouping found principally in New Guinea but with outliers in the Molucca Islands and in adjacent Melanesia, where Papuan and Austronesian languages are mingled. The aboriginal Australian languages seem to be unrelated to Papuan.

What, besides a distinctive pottery, were the main elements of this culture? First, like the coastal Austronesian-speakers of the Philippines and Indonesia, the Lapita people practiced horticulture and caught fish. Second, also like their forebears, they were voyagers. They were more than simple sailors; they were skilled mariners who were able to maintain some degree of contact between their widely scattered settlements for several hundred years.. On this point the archaeological record affords evidence of their early seafaring feats within Melanesia. Obsidian from volcanic New Britain has been unearthed at Lapita sites in Melanesia up to 2,600 kilometers away. Last of all, the Lapita people were highly successful colonizers of virgin islands.

After its initial phase of successful expansion the Lapita culture was subject to inexorable change. It vanishes from the archaeological record in Melanesia some 2,500 years ago, in the latter half of the first millennium B.C. In Tonga and Samoa, its first Polynesia outposts, the Lapita culture was longer-lived. There during the entire first millennium B.C. the new settlers developed many of the cultural characteristics that were to spread to the farthest corners of Polynesia over the next 1,000 years. Nevertheless, here too change was apparent. For example, these western Polynesians lost the craft of pottery making, possibly as a result of reduced contact with the already waning Lapita societies of Melanesia. In this connection the people of Fiji did maintain contacts with the west and as a result had a more complex archaeological record of cultural development. Today the Fijians are a population that is intermediate between the Melanesians to the west and the Polynesians to the east.

Early in the first millennium A.D. the western Polynesians, whose colonies were now more than 1,000 years old, were ready to undertake their greatest voyages. Large double canoes, able to carry the food plants and the domestic animals required for colonization, sailed off against the prevailing winds and currents to settle the Marquesas Islands in about A.D. 300 and Easter Island, one of the most isolated places on the face of the earth, perhaps a century later.

By the end of another centuries the western Polynesians had also colonized the islands of central Polynesia, the northern outlying Hawaiian chain and finally, by perhaps A.D. 900, the two great southern outliers of New Zealand.

One element that was undoubtedly essential to the success of these long and grueling voyages of discovery was strong leadership. Here the Polynesian social system of hereditary and religiously sanctioned rule must have been a great asset. By the time of Captain Cook this aspect of Polynesian social organization had given rise to the despotic and powerful chiefdoms of Tonga, the Hawaiian Islands and the Society Islands, to mention only the most developed and populous parts of Polynesia.

The Maori, the Polynesians who ended up in temperate and, by island standards, vast New Zealand were forced into some drastic economic adaptations. They replaced their unsuccessful tropical foodstuffs with the sweet potato (introduced before A.D.1000 from Ecuador or Peru by means unknow) and the rootlike rhizomes of native ferns. Pigs were not taken to New Zealand but dogs were, and other major sources of meat included marine mammals and moas, species of flightless birds, some of great size, that rapidly became extinct.

Early in the first millennium A.D., at a time when ocean trade between China and India had begun, the Polynesians Austronesian cousins in the East Indies made an epic voyage of their own and settled in Madagascar, off the coast of Africa. It was not, however, until the second millennium A.D., at some time after A.D. 1100, that the Easter Islanders, some 21,000 kilometers away on the other side of the world, began to quarry and erect their famous stone statues in rows on temple platforms. Although these works have attained more notoriety than any other Polynesian architectural feat, the temple platforms, statues and funerary monuments in other parts of Polynesia are equally impressive.

So ends this reconstruction. Some of my colleagues will disagree with me when I derive the Polynesians from a homeland in Indonesia or the Philippines. There is even a published view that the Polynesians may have arisen directly from a Melanesian genetic and linguistic matrix. There is scope here for complex disagreement, but I can see little evidence in support of that hypothesis, particularly from a genetic viewpoint. At least one thing is now quite certain: the Polynesians are not of American Indian ancestry, in spite of some evidence for minor contacts with the Pacific coast of South America.

Perhaps I may finish with an observation that could have some general anthropological significance. The Polynesians whose feats of colonization were undoubtedly the most stressful in all Oceania, also developed the largest and most centralized forms of government by hereditary chiefs in the Pacific. The ancestral Polynesians of the period of the Lapita expansion had quite clearly achieved a number of cultural adaptations - social, economic and navigational - without which the settlement of Polynesia would have been unthinkable. The systems of chieftainship, the domesticated food plants and the great canoes did not spring into being fully formed and purely by chance. They evolved partly in the early milenniums of Austronesians expansion and evolved still further as the Polynesians pushed themselves toward ever longer voyages of settlement.

For me Pacific prehistory as a whole provides a record of cultural equilibrium over long periods coupled with advancement toward greater cultural complexity. I see no signs of long-term cultural simplication or degradation, although it is true that some islands, atolls in particular, are so deficient in natural resources that the cultural development of their settlers was necessarily limited. It is also true that some islands, Easter Island in particular, had periods of cultural and demographic decline as a result of either warfare or reduction in available resources or both. Numerous examples of environmental damage, including the degradation of vegetation and the extinction of animals in prehistoric times, can also be found throughout the Pacific.

None of these exceptions, however, implies any irreversible decline in human cultural complexity. Given the many thresholds the migrants of Oceania had to cross in their long period of settlement, it is likely that any groups who slipped backward would have left few descendants to tell the tale.

Farewell to a Fellow:

Association stalwart and assistant Surveyor General Brian Mennis left Papua New Guinea in November last year after more than twenty three years in the Surveying Profession in this country.

Brian, Mary and their four children have bought a home in the Brisbane suburb of Aspley and Brian has accepted an appointment with the Brisbane Titles Office.

Brian first came to PNG in June 1959 after serving articles with Jones Flint and Pike in Queensland. He had obtained registration there 1956.

He worked as a Surveyor with Lands Department mostly in Rabaul until 1971 when he was appointed Regional Surveyor New Guinea Coastal Region, based in Madang.

Brian was called to Port Moresby as Assistant Surveyor General in 1978 and when Kisokau Pochapon resigned Brian was acting S.G. for about 12 months prior to Pomaleu Salaiau being appointed as S.G. He then did a 3 months stint as Acting Secretary of the Department and its unfortunate that more Surveyors do not get involved at this level as it could do nothing but good for the Department. Brian Mennis is largely responsible for the new Survey Act which should come into force in the near future and also for the update of the Surveying Directions 1980.

Brian is a Fellow of the Association and was President in 1974/75. He did a considerable amount of work for the Association over many years and was always very interested in encouraging National participation.

The writer had his share of scraps with Brian over the years but always found him to be fair and straight and with the best interests, as he saw them, of the Profession and the Association at heart.

He is a very accomplished photographer and his work has appeared in various magazines etc. His faithful lens seldom missed a Lady Fair.

I am sure all the members of our Association and the officers of the Lands Department would join me in wishing Brian and his family the very best of luck and happiness for the future.

His experience and dedication will be sorely missed in both areas.

MICHAEL J.LARMER
F.ASPNG

Close Program for HP 34c/11c

Following the publication in the last issue of the Journal of the Close Program for HP41c I have adjusted the program for the 34c and 11c.

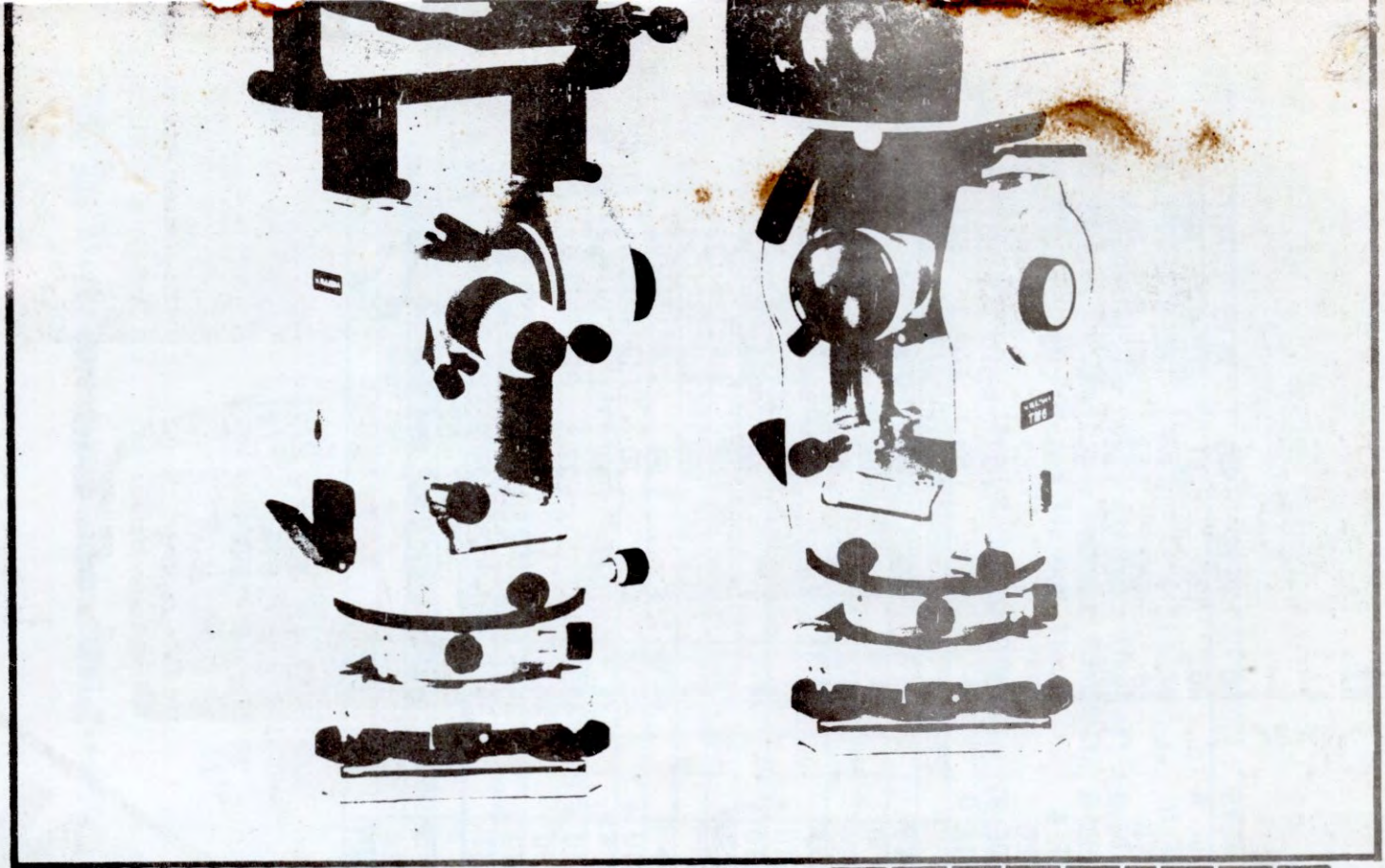
Close/Accuracy/Adjusted Area/2 Missing Distances

NO	INSTRUCTION/INPUT	KEYS	DISPLAY
1	Start Program-for Area	A	1
	No Area	B	1
2	Enter Bearing	R/S	2
3	Enter Distance	R/S	1
4	Repeat Steps 2&3 For all		
	known lines		
5	Missing distance/misclose	GSB0 (c)	
6	Missing bearing /misc.		
	Bearing	R/S	
7	Accuracy	R/S	
8	Adjusted area in Misc.		
	Targets.	R/S	
	2 MISSING DISTANCES		
9	Follow sequence steps 1-3		
10	Start program segment	GSB 2(D)	1
11	Enter bearing 1	R/S	2
12	Enter bearing 2	R/S	Distance 1
		R/S	Distance 2

NEW

RED2

A NEW ELECTRONIC DISTANCE METER



SOKKISHA

THEODIST PTY LTD

PROGRAM

NO	KEYS	NO	KEYS	NO	KEYS	NO	KEYS
1	LBL A	26	2	51	GTO 9	76	X
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3	REG	28	CHS	53	RCL 0	78	÷
4	GTO 9	29	RCL 2	54	CHS	79	RTO 3
5	LBL 8	30	+	55	RCL 1	80	RCL 1
6	SF 0	31	R ↑	56	CHS	81	RCL 5
7	REG	32	X	57	→ P	82	X
8	LBL 9	33	STO+4	58	STO 1	83	RCL 2
9	FIX 0	34	LST	59	FIX 3	84	÷
10	1	35	÷	60	R/S	85	STO 3
11	R/S	36	RCL I	61	$x \geq y$	86	RCL 0
12	→ H	37	X	62	$x < 0$	87	RCL 1
13	2	38	STO+6	63	GSB 8	88	X
14	R/S	39	R	64	→ H.MS	89	RCL 6
15	STO + 2	40	2	65	FIX 4	90	X
16	STO 1	41	÷	66	R/S	91	RCL 2
17	$x \geq y$	42	CHS	67	RCL 2	92	÷
18	R	43	RCL 0	68	RCL 1	93	RCL 2
19	→ R	44	+	69	÷	94	÷
20	STO + 1	45	X	70	FIX 0	95	STO+3
21	$x \geq y$	46	RTO+3	71	F?0	96	RCL 3
22	STO + 0	47	LST	72	GTO 1	97	EEX
23	F?0	48	RCL 1	73	R/S	98	4
24	GTO (	49	X	74	RCL 0	99	+
25	LST	50	STO+5	75	RCL 4	100	FIX 5

Note: For HP11c put in USER mode and use labels shown in brackets.

REGISTERS

0	ΣE	4	$N(\Sigma D - D/2)$
1	ΣN	5	$D(\Sigma E - E/2)$
2	ΣD	6	$D(\Sigma D - D/2)$
3	$N(\Sigma E - E/2)$	I	D

NO	CODE	KEYS	NO	CODE	KEYS	NO	CODE	KEYS	NO	CODE	KEYS
101		ABS	126		RCL4	151			176		
102		LBL1	127		COS	152			177		
103		RTN	128		X	153			178		
104		LBL8	129		--	154			179		
105		3	130		RCL4	155			180		
106		6	131		RCL3	156			181		
107		0	132		--	157			182		
108		+	133		SIN	158			183		
109		RTN	134		CHS	159			184		
110	(LBL D)	LBL2	135		÷	160			185		
111		FIX0	136		FIX3	161			186		
112		1	137		R/S	162			187		
113		R/S	138		RCL3	163			188		
114		-- H	139			164			190		
115		STO3	140		-- R	165			191		
116		2	141		STO+1	166			192		
117		R/S	142			167			193		
118		-- H	143		STO+0	168			194		
119		STO4	144		RCL0	169			195		
120			145		RCL1	170			196		
121		R	146		-- P	171			197		
122		SIN	147		RTN	172			198		
123		RCL1	148			173			199		
124		X	149			174			200		
125		RCL0	150			175			201		

ROLE OF LAND SURVEYING

IN

DEVELOPING COUNTRIES

BY

LIEUTENANT-GENERAL KL KHOSLA, BSC(DISTINCTION),BE (CIVIL), FIS,
FIE, FIGU, MASCE (USA)

SURVEYOR GENERAL OF INDIA

AND

PRESDIENT OF THE INSTITUTION OF SURVEYORS, 1978-79

&

FOUNDER PRESIDENT OF THE INDIAN NATIONAL CARTOGRAPHIC ASSOCIATION

&

A VICE-PRESIDENT OF THE INTERNATIONAL CARTOGRAPHIC ASSOCIATION

Mr Chairman, Distinguished Scientists, Technologists and Engineers, Honored Guests, Ladies and Gentlemen,

I consider it a great privilege to have been invited to present a paper on "Role of land Surveying in Developing Countries" during this Land Surveying Session. The topic of this session has been attracting a lot of attention in a number of Seminars and Symposia in various parts of the world. The term has acquired a substantial importance due to iits close relationship and relevance to the various developmental activities in any country.

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There is an understandable urge in all the developing countries of the world for an accelerated pace of economic development to raise the standard of living of the people. The continued economic growth of a country is largely dependent on the development of her natural resources and Land Surveys plays an important role in graphic communication of the necessary information.

When considering the Role of Land Surveying in developing countries, one has to take into account the problems facing these countries, namely widespread poverty, low standards of literacy, unemployment, lack of financial resources and acute shortage of skilled manpower. Above all this, economists all over the world are concerned about the menace of population explosion and the resultant continual depletion of our natural resources, leading gradually but unmistakenly to the time when our very existence on this earth would be threatened. The threat is not so acute to the few developed nations of the world but is of immediate significance to the various underdeveloped or developing countries of Latin America, Africa and South East Asia where subnormal living standards among the people are prevailing. These countries have not only to arrest their population growth but also have to make all possible efforts to create conditions whereby fullest exploitation of their existing natural resources would become possible. This necessitates immediate rapid planning and undertaking of systematic development programme, if we have to tackle the multifarious problems of a developing economy and population explosion effectively.

Land Surveying is a basic requirement for any developmental activity. In fact, it is fundamental to exploitation of the natural resources of a country. No economic planning can ever be executed successfully without the basic land surveys.

In short, land surveys influence the Socio-economic growth of a country vitally and this has assumed great significance in solving the economic and social problems of the developing countries. Accordingly, the Survey of India, which is the National Land Surveying and Cartographic Organization is being called upon to play increasingly greater role in the developmental activities in India. We, in India are engaged in a massive programme of preparation and maintenance of topographical and special purpose project maps and charts of a great variety and complexity. In addition, the National Atlas Organization and the Office of the Registrar General of India are engaged in preparation of many advanced thematic maps and atlases. Moreover the more progressive States of India have commenced preparation of regional atlases of their States for evolving regional development plans. The massive industrial development programmes of many states have placed further demands on our cartographic resources.

It is well known that several other countreis are also facing, while others will be faced in time to come with major programmes of surveying and mapping for many years ahead and will need to review their manpower resources for dealing with all aspects of the work in the expanding fields of land surveying. It is also known today that many developing countries are short of their manpower resources. Therefore, there is an immediate need for proper and effective organization of the profession.

Now, a map which is such an important tool in the hands of planners cannot be produced without the proper infrastructure. It needs an organization properly equipped and staffed with trained surveyors to do the job. The surveyors have not only to provide the basic primary network of control of geodetic accuracy to which the subsequent surveys can be tied to, but also to cover the entire terrain systematically on suitable scales to ensure that no detail which might help the planners is omitted from the map.

A survey organization has not only to provide basic topographical cover on the primary scale for use by its defence forces, administrators and planners in general but also large scale surveys for development plans. In fact, a major part of the organisation in a developing country has of necessity to be earmarked for development surveys.

In any country the survey technology practised has to be related to its resources. Today we are experiencing a revolution in the manufacture of devices for measurement and processing of data. Satellite geodesy, electronic computers, photogrammetry and automated cartography are being widely used by the developed countries. The difficulties with the developing countries seem to be human and finance. The developing countries which cannot afford all the sophistications have to make a judicious selection of technical methods to be employed in executing a project keeping in view the time the time-cost factor and accuracy desired. But then even a developing country cannot ignore to take full advantage that modern photogrammetry can offer to survey technology.

It is time that the developing countries realise that effective developments in the technology will largely depend upon the funds being allotted by their respective governments. For this, repeated efforts have to be made by them so that the utility of their end products are fully appreciated by the government at all levels. It has to be brought to their notice, time and again, that the maps and the survey data available in a country serve as an index of its developmental growth. The faster the basic survey data is made available, the faster will be a country's developmental growth. In case the developing countries fail to make their own case, the latest technology which is today available may well slip from their hands.

Speed has always been a requirement of any developmental activity. A survey organization in a developing country cannot keep pace with the increased demands placed on it unless its machinery is fully geared to the tasks it has to execute.

Projects surveys can cost a great deal of money to a developing country, but it must be remembered that it is only a fraction of a total outlay on a project, generally varying from ½ to 1% of the total cost.

Time is not far when our profession and its activities may be very different from today, with the fast changing demands from various users, we will be required to respond evern more quickly. It would be worthwhile to keep this aspect at the back of our mind from now itself.

Specially in a developing country, the role of Land Surveys cnnot be over emphasised. The various Government agencies responsible for planning must, therefore, give it due recognition and earmark necessary funds out of their outlay meant for development project, for surveys so that the development of the country is NOT delayed.

As I have said earlier, most of the developing countries are facing problems of mustering up sufficient resources in terms of money and the skilled manpower. On the first problem something has been said either. Let us now examine how to go about the problem of shortage of skilled manpower.

Most of the developing countries are already faced with the problem of finding sufficient skilled manpower to cope with the tremendous survey requirements of varied types and on different scales of their fast growing developmental activities and inadequate local facilities for survey education and training further aggravates the situation.

It must be remembered that it takes about 5 to 6 years to train a surveyor before he is productively useful. Initially, therefore, in order to make progress in the planning and execution of developmental programmes to meet the urgent need of improving the living standards of the people the developing countries have no other option but to enlist the professional and technician level support from other countries and to send their own prospective professionals and technicians for training to outside countries where such facilities exist.

At the same time, they must take immediate steps to provide the necessary facilities for professional and technician level courses in their local Universities and Polytechnics. Therefore any delay on this account is bound to effect the developmental growth ultimately. Not only that the outside assistance involves greater finances, but since the demand is of permanent and increasing nature, it must of necessity be met from local base. Then will remain the need to send a few proffessionals abroad fro training in advanced courses and participation in the various professional associations in order to remain abreast with technological advancements taking place elsewhere in the profession.

In India, we have our own institute to meet the training requirements. It is known as the "Survey Training Institue", housed in modern buildings located in a 90 hectare campus on the outskirts of Hyderabad in Central India. It is the premier training establishment of the Survey of India which was raised from 6th May 1967 making use of the existing elements of the Training Directorate. With UNDP assistance, it has been well equipped with a wide range of modern geodetic, photogrammetric, cartographic and printing instruments and machines. The institute though primarily meant for the Indian Surveyors, also caters for others from neighbouring developing countries.

It is important the every developing country should make efforts to gradually develop strong indigenous and active professional societies in order to meet the cartographic needs of their various developmental activities, both qualitatively and quantitatively. To achieve this, every country needs to have rigorous and strong professional society which will provide a common forum for mutual exchange of ideas among like-minded persons by way of seminars and symposiums held at frequent and regular intervals. The professional society should also hold examinations at different levels and award appropriate diplomas and degrees which should be recognised by the local Government for providing better employment. This will also serve as an incentive to the concerned individuals. Thus, the society will be aimed at stepping up professional advancements locally and making contributions to international associations in any sphere(s) of the profession.

There should be a sincere effort to forster collaboration between our profession and other professions responsible for planning and implementation of national development programmes. For a balanced approach to developmental planning an overall view of the totality of the problems, demands on resources and the feasibility of meetings such demands is necessary before decisions are taken and implemented. It is therefore, important that both micro and macro level needs are suitably co-ordinated and brought in harmony within the framework of national resources and national aspirations. In other words, what is really important is to look upon development from an "Integrated" standpoint. It, therefore, also follows that the data required for such planning and decision making should also be suitably integrated. Only a co-ordinated approach for national surveys can meet the data needs from scientific, economic, social and isntitutional standpoints. Surveys carried out by the national survey agencies would be required to suitably organized for data collection and integration, instead of merely open-ended surveys in a variety of disciplines, as at present.

Survey requirements for developmental needs are varied and multi-disciplinary. They require an integrated approach in data collection and analysis. With limited survey resources and time, it is essential that the normal survey activities of the national and state survey agencies have a common scientific and technological framework of data for each of integration and extraction of requisite information for various purposes. This requires a co-ordinated approach to inter-agency research and training in fields of resources surveys, analysis utilisation and conservation. It also necessitates the development of an earth resources geographic information system based on compatible resource data within a special framework. Proper appreciation of the data needs for planning and development of such an integrated approach to resource surveys and utilisation will be a major step in economic development.

It would be in the overall interest of the developing countries, considering the importance and vast potentialities of the Surveying Profession, to have the planners and administrators 'survey-orientated' and for this purpose specially designed short term courses/workshop/seminars should be provided.

It would not be out of place here to emphasise again that our professional societies must endeavour to bring home the role and importance of land surveys to all planners responsible for development. Unless those responsible for development projects and those ear-marking funds understand fully the importantce of surveys the profession is likely to be neglected and the interest of the country will thus suffer.

In India we have two main professional bodies operating in the field of surveying:

- Institution of Surveyors,
- Indian National Cartographic Association

The Institution of Surveyors conducts professional examinations invarious surveying disciplines which have been recognised for recruitment to certain senior posts by the Government of India. A professional surveyor after completing this training in the Survey Training Institute has to qualify in an Examination held by the Institution of Surveyors before being considered as professional.

It is a practice in some countries that the land survey and the cartographic requirements are only tackled by the Government surveyors. But there are other countries where the profession is practised, in addition, by private surveyors. In the latter case, it is important to have the registration of the profession which implies that no person is qualified to carry out any of the specified functions, unless he is admitted to the prescribed register provided by the constitutional enactment by the local Government.

This is necessary to provide protection to the public. A person who is registered as a professional, would imply that he has attained the required competence, by knowledge and experience, to perform his professional work. This fuention of registration could be easily discharged by the local professional society.

Now a few words about one of the most important aactivities in any profession - the aspect of Research and Development. Unless this aspect is in-built and forms an integral part, no profession or technology can progress. No doubt that a developing country with very limited resources may not be able in the first instance to afford research in basic science but it must need to have it in its applied field at the earliest, when resources permit.

Such a in-built reserach and evelopment activity in our profession will enable us to streamline our present procedures towards better performance results and increase our know-how in the technological field, gradually resulting in greater self-reliance and less dependence on foreign technology. Self-reliance in science and technology should not, however, mean that we isolate ourselves from the international scietific community or refuse to absorb whatever is useful in the achievements made in other countries. Such self-reliance will naturally involve further development in various fields responding to specific needs and priorities of the country. It is no doubt desirable to employ indigenous technology but it is also not wise to discard any technology on the sole ground that it is foreign and involves foreign exchange. It, therefore, calls for a judicious mixing of both objectives of deriving best and maximum results in least time.

Before I conclude my talk, I would like to mention a few words about manning scales. As I have said earlier during my talk the larger the basic scale of the topographical map of a country, the larger is its development growth.

There is no technological reason today as to why the whole world cannot be mapped at medium scale on 1:25,000. In a large country like ours, we are so far having 1:50,000 as the basic scale of topographical mapping of the country excepting certain selected areas of economic importance where the basic mapping scale of 1:25,000 is adopted. But, now considering the rate of developmental activity in our country, we have found it expedient to switch over to the adoption of 1:25,000 as basic topographical mapping scale of the country. But for small developing countries, they should not have any problem in deciding for entire topographical coverage on 1:25,000 scale.

To sum up, I would say that considering that land survey is pre-requisite of any developmental activity to improve the lot of people, any pains taken in the organisation and development of the survey profession will prove ultimately rewarding. Most of the developing countries are poor and for them to become rich they must develop their available resources. To ensure that, the first step is to take inventory of their natural resources, which necessitates cartographic demands. Any delay in surveying and mapping would ultimately cause considerable dely in the development of the country. There is, therefore an urgent need to lay due stress on development of, and for according due recognition to the profession of surveying and catography. The profession deservedly merits better recognition then accorded to it, hitherto.

In conclusion, I would like to thank Dr. Alex McEwen and the organising committee of CASLE for the honour done to me and for giving me this opportunity of presenting these views. Finally I would like to thank you all for the patient hearing given to me for so long.

The above article was a paper presented by Lieutenant General K.L. Khosla at the CASLE Seminar in September 1981 in Ottawa Canada.

THE ASSOCIATION OF SURVEYORS
OF
PAPUA NEW GUINEA

P.O. BOX 1367
RABAUL.

MINUTES OF THE 143RD MEETING OF COUNCIL HELD IN PORT MORESBY ON 25TH OCTOBER, 1982.

PRESENT:		
	Skerry Palanga	PRESIDENT
	Brian Mennis	HON. SEC/TREASURER
	Pomaleu Salaiau	VICE PRESIDENT
	Clive Bassett	COUNCILLOR
	Steven Low	"
	Norm Leet	"
	Des McNee	"
	Bill Mitchell	"
	Alan Bale	"
	Francis Posanau	"

The President opened the Meeting at 5.00 p.m.

1. MINUTES OF THE 142ND MEETING

It was moved by Mr Mennis seconded Mr Low that the Minutes of the 142nd Meeting be accepted.

2. BUSINESS ARISING FROM THE MINUTES

2.1 Secretary to forward K202 to Jerry Sipuman as requested in previous Minutes.

3. CORRESPONDENCE AND BUSINESS ARISING THEREFROM

3.1 INWARD:

3.1.1 Letter from Unitech regarding a donation for prizes for Graduation day.
It was moved by Mr Leet seconded Mr Bassett that K160 be donated for this purpose and the prizes be allocated in the following manner:- K40 - Dux of 5th Year; K40 - Dux of 4th Year; K40 - Graduate with best Practical Project.

3.1.2 Letter from Brian Mennis resigning from the position as Association Sec/Treasurer as he is leaving the country. It was moved Mr Leet, seconded Mr Bassett that the resignation be accepted.

3.2 OUTWARD: Nil

4. APPLICATION FOR MEMBERSHIP:

4.1 Application by Mr Adelbert Alois for upgrading from Associate Membership to Corporate Membership.

4.2 Application by Mr Rira Kizana for Associate Membership.

It was moved by Mr Posanau seconded Mr Low that both applications be rejected due to lack of information on the back of the application forms, no copy of certificates and no nomination fee. Motion carried.

5. ACCOUNTS FOR PAYMENT:

5.1 From Mr Jocko Oberlueter K100 for printing of Congress Papers.

5.2 From Des McNee K79.65 for Journal mailing charges.

5.3 From Steven Low K7.95 for refreshments for 143rd Meeting.

It was moved by Mr Posanau seconded Mr McNee that the above accounts be paid. Motion carried.

6. GENERAL BUSINESS:

6.1 Replacement Councillor - it was moved by Mr Bassett seconded Mr Bale that Mr McNee replace Mr Mennis as a Councillor as he was next on the Ballot list. Motion carried.

6.2 Replacement Hon.Sec/Treasurer - nominations were called for to replace Mr Mennis. Mr Bassett was nominated by Mr Mitchell and seconded by Mr Leet - elected unopposed.

6.3 C.A.S.L.E. Executive Committee.
It was moved by Mr Mitchell seconded Mr McNee that a letter be sent to Mr Pochapon suggesting that he may wish to resign from the CASLE Executive as he is no longer a Member of our Association. Mr Low was nominated by Mr Leet and seconded Mr Posanau as a replacement for Mr Pochapon. Motion carried.

6.4 Proposed Amendments - Survey Act and Regulations. A copy of the proposed amendments were circulated to all Councillors prior to the Council Meeting by the Secretary Mennis. Councillors Leet, Mennis and Salaiau gave a detailed explanation as to why the proposed amendments were being introduced. The subject was discussed in detail with Mr Posanau speaking strongly against the proposal for Certified Measurers. It was moved by Mr McNee seconded Mr Bale that the amendments as set out in Lands Departments Draft 2/82 be included in the Survey Act. Motion carried.

6.5 Scale of Fees -
It was moved by Mr Mitchell seconded Mr Leet that a Draft Copy of the New Scale of Fees together with the various written comments be circulated to all Councillors by the Secretary before the next Council Meeting.

6.6 Survey Congress -
Mr Mitchell suggested that consideration should be given to holding Congresses every two years in future.

6.7 Fares for subsidising for Councillors attending Meetings - It was moved by Mr McNee seconded Mr Mitchell that 'out of town' Councillors receive a half subsidy on air fares to attend Council Meetings if requested. This would include a request by Mr Larmer to attend the Board of Studies Meeting in Lae.

6.8 Cash Flow Prediction -
The Secretary was requested to work out a Cash Flow Prediction to be brought up at the next Council Meeting.

7. Date of the Next Council Meeting.

The next Meeting will be held in mid January 1983.

The Meeting was declared closed at 7.30p.m.

A.C. BASSETT
HON. SECRETARY/TREASURER.

Dear Editor,

I am a little concern about Brian Mennis's comments (Jan-March '82 Journal) regarding presentation of cadets projects to the Surveyors Board.

It appears to me he has misrepresented some points and has taken a narrow view on this important issue. He criticised the cadets for poor presentation. However, when one looks at the whole system one can see that it is not that easy to put it in as narrow a view as that. For any problem, there must be some underlying cause. Our cadets surely under this circumstances must be finding it difficult to pass the Board Exam. Our current figures speak for themselves. Out of more than eighty (8) survey graduates, only fifteen (15) have obtained their license over the last 10 years. Why is this? Should we put the blame entirely on cadets shoulders, as Brian seemed to indicate. What are the main reasons for their failure? Is our Registration System appropriate to our needs or to a changing PNG Society? If not, can we make some changes or improvements? What are our alternatives?

My aim is to try and provide some answers or solutions to some of the above questions, and hopefully some of our members and even cadets themselves will make some comments on them.

I feel Brian has misinterpreted one or two points. I am also a member of the Surveyors Board and I am not aware or was not consulted. I resent the way it was put in the Journal and the manner or style it was put.

I don't believe that Papua New Guineans do not want to get registered. This is a very short sighted statement, said in an emotional manner. Brian obviously knows that not all cadets submitted rubbish work and presentation. We have to be a bit careful. It has to be made clear that some cadets do submit good work - meeting the Surveyors Board standards.

I have been in the Surveyors Board for more than 6 years and I know some cadets have submitted excellent work and I congratulate them. Some cadets that I noticed, tried hard to pass but were unsuccessful - I hope they will fron the Board again.

The point that I am trying to make here is that for any examination, there has to be some failures. In my mind, if everyone of those who sit for an examination passed there must be something wrong and on the other ahnd if everybody failed, there must also be something wrong. So what is Brian trying to say here. Is he implying that the whole registration system is no good i.e it is not working or is he saying that the education standards of our cadets are not good enough. If this is so than is he implying that Unitech Surveying Courses, dc not adequately provide for a graduate student to sit for the Board Examination after more than eighteen months field practice, or is he indirectly implying that the cadets Master surveyor is not doing his work sufficiently or that the cadet employer is not providing enough field experience. All these questions came into my mind as I ponder over Brians comments.

THE REGISTRATION SYSTEM:

To a certain extend our registration system is fulfilling its role of registering professional surveyors capable of meeting the standard of work the country needs. However to improve on the system I feel we need a review of our registration system now to cater for the changing policies. Some of these new government policies that will have a significant bearing on our profession will be that relating to Customary land registration. What standard of Survey should we be looking at, bearing in mind cost factor. However in relation to education and training I am reasonably confident that the restructured surveying course at Unitech where there is a year field practice after second year should eventually produce cadets who should in shorter time front the Board for their license. Again this brings out another question that the Association and the Board should consider and that is what minimum period of time should these cadets have before sitting for their Board Exam.

A. MASTER SURVEYORS

I feel experienced surveyors and Master Surveyors are not doing enough in assisting cadets. Some of us are neglecting our role and responsibility. We are not committed enough.

We are not providing necessary advice in particular checking on whether or not our cadet has a plan to cover the areas required for the BOARD.

Our 41CV's are becoming more important to us because we bother about how much money we are making or are going to make in a month or a years time.

To Master Surveyors, there is a need for full committment, whether we are in Government or Private Business. We need full co-operation and understanding. I dont really believe we are doing enough to pass on our knowledge, and experience to our younger members. For our part, those six (6) points that Brian mentioned should have been ironed out and practised in the two year that a cadet is out working. It is no good at all, not advising or checking any of these important practices with our cadets before they depart for Moresby.

The failure of the cadet is indicative of the failure of the Master Surveyor. That must be correct.

On the other hand, to complicate matters, a certain surveyor was heard saying that cadets should not get any assistance at all from Master Surveyors. I feel this is a contradiction of our basic principle of training or learning. Again the Association and the Chairman of the Surveyors Board should clarify the role and responsibility of Master Surveyors. This type of comment could lead to frustration and confusion resulting in more failures.

B. THE SURVEYORS BOARD.

The present arrangement whereby members of the Board are appointed seem to get the support of many surveyors. I feel, the way the Association recommends its 4 members to the Minister is satisfactory in that it allows rank and file members to initially vote for the man of their choice In the past this system allows for private surveyors to be represented in the Board.

However for the Surveyor General's list (ie recommend Lands Department surveyors to the Minister), I would like to see a change. I feel the Surveyor General's list should include a surveyor from Works & Supply. The reason is simple. Not only that the Engineering Project is one of those compulsory tasks that a cadet must practice and submit to the Surveyors Board, but in Papua New Guinea, Engineering surveying is becoming very important.

Today most private surveyors spend perhaps 60/70% of their work time on engineering surveys. (I hear Lands Department is spending very little contract money this year).

Another change that I would like to see is to also have a representative from Unitech Surveying Department represented on the Board. The Unitech representative should either be a registered Surveyor or the Head of Surveying Department. Again the reason being that the University would work on improving some of the areas that cadets are having difficulty with in the Board. This will, I feel, lead to greater improvement of our registration system and hopefully more cadets registering.

Finally on registration, I would like to comment on an issue that caused controversy to some of our members in the recent past, and that is the question of registering other discipline in surveying such as Engineering Surveyors, geodetic etc. I feel the majority of our members would support this change. In my mind, this would relieve the frustrating situation at the moment. So that Lands Dept can concentrate its cadets on cadastral surveys only before they confront the Board. They don't have to waste their time getting experience in Engineering survey which the don't normally do.

The Surveyor General was intending to make an amendment to existing Survey Act to provide for this. Perhaps the Surveyor General could make a comment on this.

C. CONCLUSION

Incentive today is our golden word, whether we are employed in government departments or private sector. The rate of archievement and attaining result in an organisation I believe is directly proportional to the size of incentives provided. What are the incentives we are talking about. They are housing, good salary, better training facilities, promotion and so on. It is up to the bosses, to provide for these incentives if they want improvement or attain higher result e.g. registering their cadets.

However one of the sad anomalies in government departments is that a graduate surveyor after 4 or 5 years University study is paid on a lower salary scale than a mere clerk who certainly has none or little training. Lets take a clerk class 5 position. A grduate surveyor when recruited by government departments, starts on clerk class 5 level. However, one will find that in the actual salary level a clerk is paid on higher scale of C.C.5 than a graduate surveyor and the difference is quite substantial.

The Association and the government departments concerned, should consider reviewing this P/S anomally and try to resolve this. I feel it should be the other way around, where the graduate surveyor should be paid on the higher salary scale. The same goes for draftsmen etc.

Finally, whose idea was it that the Board should send some projects to other institutions for examination and recommendation before the Board comes to making final decision on that cadet's project. This practice to me should be thrown out altogether. The Board should be competent enough to decide whether a cadet's project is satisfactory or unsatisfactory. It wasn't practiced, I don't think, during my time as a cadet. This is another reason I thought we should have a representative from Works & Supply in the Board.

Papua New Guinea has the time to make registration work. I have indicated some areas where given time will lead to an improvement of our registration system. We require though patience, dedication and greater understandings.

We should not give up hope, Papua New Guineans are interested in getting their registration. Many of us national surveyors are committed to improving the standards or our profession and its reputation.

We have already established a surveying system that I feel is one of the best in the developing countries. We should be proud of this. We should actually complement and be thankful to these early surveyors like Graham Matheson, C. Sparks Carrol, Brian Mennis, Tom Richards, and many others who took up the challenges to cement the present system. We should not abandon it now.

CONCLUSION

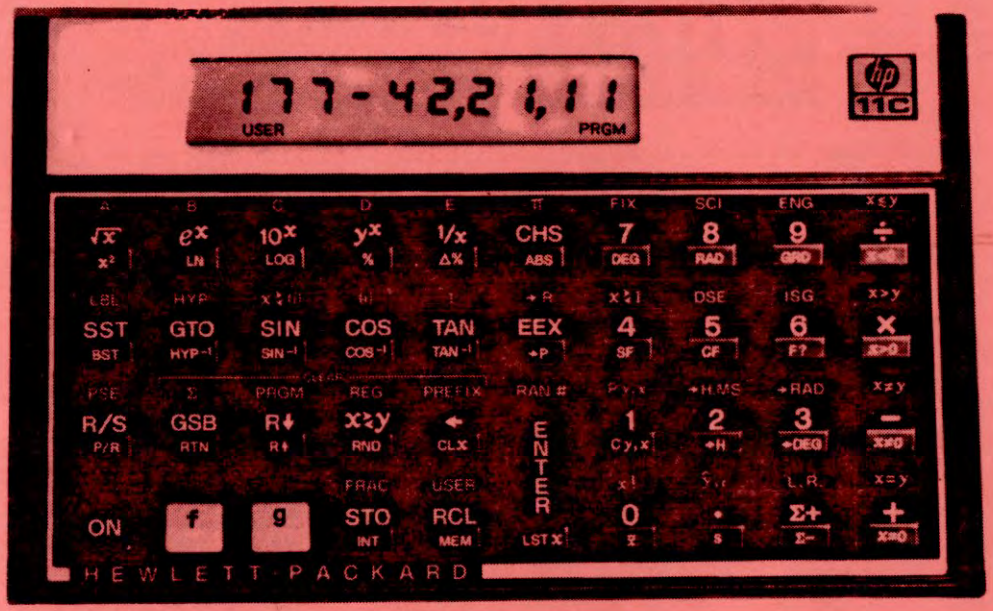
Papua New Guinea should continue using the existing surveying system, however it should also adopt changes to cater for the country's economic needs and priorities. Some development projects require a higher standard of survey work such as mapping. However some projects will require lower standards, such as the anticipated Customary Land Registration policy, which because of cost factor may not require qualified, registered surveyors.

In policy areas such as this, I feel it should be the national surveyors who should be taking the initiatives and spelling out surveying policies and not expatriate surveyors. We national surveyors are against people who tend to bulldoze policies through the Association. I think we required respect and understanding.

The future development of our country will depend on effective and efficient information (data) system. As professional men/women entrusted with the responsibility to ensuring this data services, we need to maintain the existing surveying system. This means we need to educate and train our young men and women to the standards required. Thus will continue to maintain our existing registration system. There is no two ways about it.

It is our responsibility then to co-operate. We need commitment. The Surveyors Board should not give in to minor issues. It should set high standards and everyone of us including cadets should work towards that standard. At the same time, however we must accept changes, because without changes our organization will due away.

FRANCIS POSANAU.



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