

M.J.L.

THE JOURNAL

of the

ASSOCIATION OF SURVEYORS OF

PAPUA AND NEW GUINEA



VOLUME 1

No. 1

JANUARY

THE ASSOCIATION OF SURVEYORS
OF PAPUA AND NEW GUINEA
OFFICE BEARERS 1970-1971

President

John C. Macartney

Vice President

Ken St.Clair Matheson

Honorary Secretary-Treasurer

Graeme Sparkes-Carroll

Councillors

Gilbert R. Hole
Michael J. Larmer
Brian J. Mennis
Thomas W. Richards
Jeffery J. Tierney
John C. Williams

ROLL OF PAST PRESIDENTS

1960-62	C.W. Sparkes-Carroll
1962-64	R.G. Matheson
1964-65	O.G.G. Dent
1965-66	T.W. Richards
1966-67	J.C. Williams
1967-69	T.C. Jackson
1969-1970	T.W. Richards

Please address all communications to the:

Hon. Secretary
Association of Surveyors of Papua & New
Papua and New Guinea,
P.O. Box 5056,
BOROKO. T.P.N.G.

THE JOURNAL
OF THE
ASSOCIATION OF SURVEYORS OF PAPUA AND NEW GUINEA

Vol. 1

January, 1971

No. 1

The quarterly journal of the Association of Surveyors of Papua-New Guinea, published in the interests of the surveying profession.

BUSINESS MANAGER

M.J. Larmer

EDITOR

G.G.D. Arman

CONTENTS

PAGE

EDITORIAL
COUNCIL NEWS
REPORT ON 5TH CONGRESS
G.R. Hole
MENSURATION OF LAND PURCHASES
S.G. Brisbane
SURVEY TOPICS - Anon
SLAVE OF FEES - G. Arman
SELF WINDING PLUMBOB
Mark Olidoit
RESULT OF COMPETITION
PERSONALITY OF THE PROFESSION
CORRESPONDENCE

(Views expressed herein are those of the authors and not necessarily those of the Association).

ALL RIGHTS RESERVED

Subscriptions - per annum \$2.00
per issue \$0.50 Aust.Currency

SUB-COMMITTEES

Scale of Fees

K.St.C. Matheson
G.R. Hole
G.G.D. Arman
P.R. Zwart

Survey Education

J.C. Williams
G.R. Hole
P.R. Zwart
G.G.D. Arman
I. Johnson

Survey Co-Ordination

M.J. Larmer
D.N. Smith
J.R. Roberts
J.J. Tierney

1971 Congress

J.C. Williams (Congress Manager)
B.R. McLennan
D.M. Husband
S. Scriven
B.J. Mennis

REPRESENTATIVES - PAPUA AND NEW GUINEA SURVEYORS BOARD

G.G.D. Arman
M.D. Kellock
J.C. Williams

E D I T O R I A L

It's been four years since our Association advocated the conversion to the Metric System for Cadastral Surveys in Papua New Guinea.

All Members must agree that the Association has been a Leader in this direction and hoped that others would follow - they haven't.

Proposals to Administration Depts. to consider the use of the Metric System for all Surveys, fall on deaf ears, if we can do it, why can't somebody else?

A standard base can't be laid down because of red tape.

Old Cadastral Surveys are still in links and will remain so until some action is taken.

The Surveyor is bearing the brunt of the cost of conversion.

On reflection it would appear that any Country wanting to convert to Metric measurement should not come here to appraise its value, as all we have done is to change the unit of measurement. We still have our old values.

And if there is any connection between 1 in 8000 and the Metric Unit it isn't too obvious, especially to the Indigenous Graduate.

On the credit side, criticism is easy, of an attempt to change the thinking of the majority of the Organisations associated with our Profession.

Must we take a forceful attitude and demand our rights to produce all Surveys, past, present and future in this Country in one unit - metres? I hope not.

G. ARMAN
EDITOR

NOTICE TO SUBSCRIBERS

The Associations Journal this year is presented in a completely new format and it is hoped that the slight delay in its production will be offset by its enhanced value.

Although the Journal has been in existence for some years in its old roneoed form we have started this issue at Volume 1, Folio 1, and will produce further folios at quarterly intervals i.e. January, April, July and October.

G. Arman
Editor.

NOTICE TO ALL MEMBERS

This Journal is for the benefit of the Surveying profession in the T.P.N.G.

To date the contributors to the Journal can be counted on one hand, despite the efforts of those writing the articles to make the Journal interesting, topical and radical.

It is the aim of the Council to bring the standard of the Journal to a position of acceptance overseas.

This cannot be done without the help of all interested members contributing articles and papers etc. and to make a success of the only media we have between Congresses, this Journal.

It is also an opportunity to keep our place as the oldest and most respected Society in the Territory.

If you have anything which you think may be of interest then send it in. Better that than nothing at all.

Graeme Arman
Editor

COUNCIL NEWS

Members are advised that the Association Crest is for the use of the Association only and is not to be used on letterheads etc.

Members who are at present using the Institute Crest on letterheads are advised to check with their respective State Division as a recent edition of the Queensland Bulletin stated that the use of this Crest by Members of the Institute was prohibited.

Council wish to call for nominations for Fellow of the Association. Under the Articles of the Constitution of the Association it is necessary for the nomination to be made in writing and to be endorsed by a minimum of six Corporate Members.

It is hoped that nominations, if forecoming, will be received prior to the Sixth Survey Congress in Rabaul.

.

Members are reminded that should they at any time feel that the Scale of Fees warrants review or thought, to write to Council and apply for a consideration or ruling on their particular problem.

.

Graeme Sparkes-Carroll
Hon. Sec.

REPORT ON 5TH SURVEY CONGRESS - LAE

Gilbert R. Hole

The Association of Surveyors of Papua and New Guinea held their 5th Survey Congress and 11th Annual General Meeting at Lae, New Guinea during the week, 20th - 24th July, 1970.

The association was particularly fortunate in receiving a great deal of assistance from the Commonwealth Foundation to allow members of the profession from developing countries to attend. Among these were Tillock Verma from Fiji, Poh Sin Bin from West Malaysia and an old friend John Tongalava from Tonga.

I.S.A. Federal President Jim Love also was assisted as was Ian Service from New Zealand.

Other visitors included Tony Bomford (National Mapping), John Pike, John Sheehan and Dave Carsten from Queensland and Jim Innes Brett, Deputy Surveyor General from Canberra.

The venue for this year was Lae, on the North East coast of the New Guinea Mainland and one of the most important towns in the Territory, being a large discharge port for the whole of the Highlands area and the terminal of the Territory's most important road, the Highlands Highway.

Of further interest to surveyors in choosing Lae was the Institute of Technology which is the Territory's tertiary education centre for Engineers, Architects, Surveyors and other professions on the technological aspect. We also invited students to attend some of the papers.

It was particularly pleasing to have Alan Bale attending as an associate member, Alan is now a staff surveyor with the Department of Lands, Surveys and Mines in Port Moresby.

Delegates began arriving at Jacksons Airport, Port Moresby over the weekend, some going straight on to Lae, others spending the weekend in the Territory capital.

The registration formalities and booking in being dispensed with Monday night saw an informal reception at President Tom Richards' eminently suitable house, with his pool in the tropical surroundings being a welcome change from the bleak weather left behind by southern visitors.

It is to be noted however that as the "informality" of the night wore on the treacherous pool claimed many victims.

Down to serious business on Tuesday when Deputy District Commissioner Bunting formally opened the congress at the Nyall Community Centre.

Sir Donald Cleland, a former Administrator of the Territory, gave the opening address and traced the history of development surveys, making mention of the good work done by patrol officers in the Territory and expressing a confidence in the future for all professional callings.

The reference to technical papers is purely a summary and the comments my personal ones.

If I appear to have dwelled longer on one or two it no way reflects the interest shown by all members in the others.

No congress can succeed without a continued effort of all and to those who gave papers the Association feels a deep sense of gratitude, as indeed also to Mike Kellock and his Lae team who did so much in the organizing of the overall event.

Ken Phillips of Kennecott Explorations opened the Technical sessions by giving the audience a most comprehensive and authoritative outline of the role of the Geologist in major explorations. David Carstens paper on transmission line surveys was followed with keen interest, as this is definitely one sphere where increasing activity in the Territory will involve a large amount of survey and investigation.

Graeme Cocks and member Alan Shepherd both gave excellent papers on the photogrammetric aspect with developments in the use of the medium and specific reference to its application for access surveys.

Alan's experience in Bougainville was of particular interest.

Director of Lands' Don Groves insight into the forthcoming Territory Land Tenure system was really "hot news". Don had recently returned from a study trip to Kenya to study their systems. A great problem exists in the Territory in this sphere.

Jim Innes Brett's combined effort on Doppler Systems had most of the "jigger and chain" men goggle eyed. But who knows to what bounds science will extend the profession anyway. In twenty years time it may be "old hat". Jim's talk made one wonder how Cook ever succeeded with his equipment!

Other Technical papers were given by members Clive Sparkes-Carroll and Des Husband (the latter in his absence by Max Muller) concerning the various aspects of Planning and the Oil Palm Scheme in West New Britain, looked at from an Administration point of view.

There was also an excellent talk on the survey procedures in a large mining venture. John Sheehan who is chief surveyor at Mt. Isa Mines, backed his lecture with slides and in all it proved most fascinating. Although generally all underground work as opposed to C.R.A's activities on Bougainville it was food for thought for many Territory surveyors, with the increased mineral exploration being carried out.

"Hitecs" Bruce Forster's paper was a very thought provoking effort and in the opinion of the writer one which should be studied by all professions.

The sociological aspect of planning, and let's not get into the old argument about planners being Architects, Engineers or Surveyors, was one which did prove how too quickly all professions tend to follow this preconceived ideas; what's good for Australian cities is good for Papua - New Guinea. Bruce's final remark about the conventionally designed street patterns of the Territory's towns made obviously for motor traffic when something like 90% of the population is pedestrian, was all too true.

Papers followed from Housing Commissioner Stolz, Co-ordinator of Transport, Macdonnell and Assistant Economic Advisor Parker, all excellent examples of the multitude of facets which go to make up planning in the overall sense of the word, and how many different disciplines are involved in modern development. To describe each in detail would be beyond the scope of this report, but all are available for the keener student.

Our thanks is especially due to those gentlemen outside our profession who contributed so much to the success of the technical sessions.

On the social side the Association lived up to its previous record of "no dull boy Jack". There seemed to be plenty of play, some formal and some informal.

The President's cocktail party on Tuesday night was the first formal occasion and one must not forget the effort put in by the ladies who organized the fashion parade at President Tom Richard's house.

This poolside event was originally intended for the ladies, but several dozen ogling "masta maks" (Pidgin for surveyor for our overseas readers) turned up, enjoying the excellent food and scenery.

The annual dinner was the last formal social gathering, one which your correspondent regards as the most important social gathering held in the year, for our association.

Best let it be said that knowing new President John Macartney's feelings it will stay formal with a capital 'F'.

The annual meeting to follow on the last day was extremely well attended, and probably the most significant move was the decision to give our annual congress a moving venue. Despite some stiff opposition, John Williams' motion to have 1971's in Rabaul won out, and it was a very thoughtful looking John who left the meeting! Knowing our Rabaul team we can have no worries though, but a lot of work is in the offing for their moderately limited members.

Incoming President John Macartney took the chair with his new council consisting of Secretary Graeme Sparkes-Carroll, Ken Matheson, Brian Mennis, Graham Matheson, Michael Larmer, John Williams, Gil Hole and Tom Richards.

The week drew to a close with a magnificent Barbecue at Ivan Bryning's home with some traditional Territory cooking, and plenty of traditional Australian drinking, and thanks indeed are due to the Brynings and helpers for their effort.

So our congress closed, a small one by Australian standards, but one which all felt was one our Association could take pride. It's to be hoped that with regard to the future of the surveying profession in the Territory our newer surveyors, both indigenous and expatriate, will carry on the excellent example set ten years ago by a small group of dedicated professionals.

HIGHLIGHTS AT THE ANNUAL DINNER



Left: T. C. Jackson already a tie club member receives the "Stirrers" paddle.

Below, from left: T. W. Richards, President 1969-70, J. J. Garrett, M. C. Annual Dinner, J. C. Macartney President elect 1970-71.



Right: C. W. Sparkes - Carroll is initiated to the "Tie Club" with acclamation.

Below: I. B. Bryning & D. S. Fitzhenry sing the praises of retiring president T. W. Richards.



Circular.

Government Secretary's Office,
Port Moresby, B. N. F.
20th January, 1899.

Sir,

I have the honour, by direction of the Acting Administration to enclose for your information herewith a copy of a little work on Mensuration and some notes on computing areas of land with an illustrative diagram - which latter were prepared in the Department of the Surveyor General, Brisbane.

As Government Officers of this Possession are frequently required to deal with the measurements of land acquired from Natives, etc, and to give an approximate statement of the areas obtained - His Honour has felt desirous of facilitating this branch of duty as far

as

The Assistant
Resident Magistrate,
Eastern Division.

as possible and instructed me to communicate with the Surveyor General - Government and invite the recommendations of any tables or works which might simplify the above calculations. In reply the accompanying enclosures were obtained and are now forwarded for the use of your Office in as far as dealings with land matters are concerned.

I have the honour to be,

Sir,

Your obedient servant,
A. Macpherson.
Government Secretary.

Chief Secretary's Office,
Brisbane,
29th October 1898.

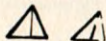
Notes re Taking out Areas.

No 'Ready Reckoner' for Areas has ever been published - such work being inherently impossible, as the variation in shape, length and breadth and other details are illimitable.

Nothing can be done without some details as to shape and dimensions and to these the ordinary rules of Mensuration may be applied.

The following rules for variously shaped blocks may be useful.

Triangular - Area = half base $\times$ perpendicular height.
The perpendicular height of a triangle, is the perpendicular drawn from the vertex of the angle opposite to the base, to the base itself, or to the base produced according to shape of triangle, then -



Rectangular - Area = length $\times$ breadth.

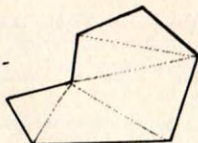
Quadrilateral but not rectangular -

divide the two triangles - thus -



Rectilinear but many sided -

divide into a number of triangles - thus -
or treat as irregular.



Irregular - Make a plot to scale and then the area may be taken out.

1. With the Planimeter, if the instrument is available.
2. The irregularities may be reduced and the area taken out as a rectilinear figure, as per attached example.

For approximate reductions of irregular boundaries, a good method is to apply a horse hair or silk thread across the crooked sides in such a manner that the small parts cut off by

by the thread may be equal to those included, and then draw a line along the thread. A little practice will soon enable this to be done with fair precision. A little bow may be made with the horse hair or thread, by stretching it in a piece of whalebone or other elastic material. This will keep the thread straight so that it can be used with facility.

3. Another quick and fairly accurate method of finding areas approximately, is to have a piece of glass or horn, tracing linen, paper or other transparent substance, ruled off into squares of known area and to place this over the sketch. The area may then be readily found by inspection.

The accuracy of all these methods depends upon the accuracy of the plot.

Further information may be obtained from any text book on Mensuration. The little book * herewith is practical, contains the principles in small compass and is not too dear. Particular attention is drawn to -

Chapter	III.	p.	18.
	IV.	p.	26.
	V.	p.	34.

The Appendix on Land Surveying " 105.

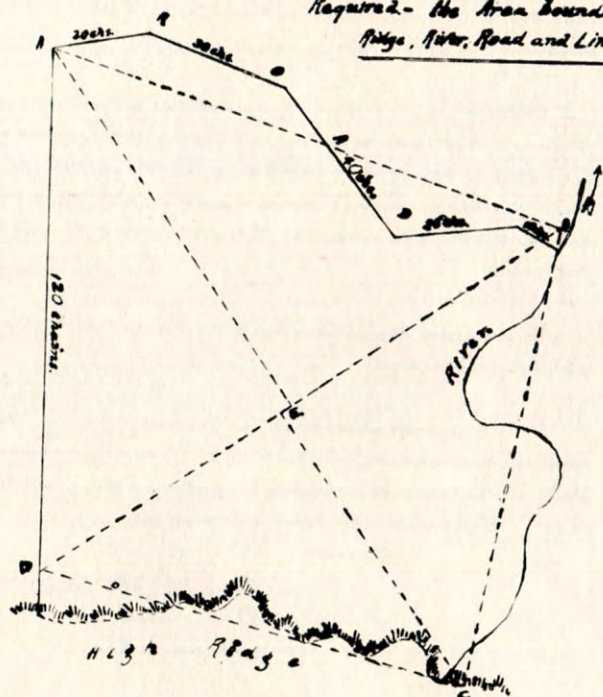
* 'Elements of Mensuration and Land Surveying
by the Rev. John Hunter, M.A.

John C. P.
M. B.

EXAMPLE

Scale 20 chs to an inch.

Required - the Area Bounded by
Bridge, River, Road and Line.



The irregular-bound river having been reduced, the figure ABCD is equal in area to the piece required - and taking BD as a diagonal and AB, DC at right angles thereto, the area is found by multiplying half of BD by each of AE and FC or

$$\frac{BD}{2} (AE + FC).$$

$$\frac{120}{2} (70 + 70) = 6600 \times 161 =$$

By Scale Thion

$$= 10626 \text{ sq. chains.}$$

$$= 10626 \text{ aces.}$$

Frontage - one third of depth

Area	Frontage	Depth	Area	Frontage	Depth	Area	Frontage	Depth
Acres	links	links	acres	links	acres	links	links	links
1 1/2	189	387	35	1080	3240	320	3266	9798
1	182	548	40	1154	3464	350	3415	10247
2	258	775	45	1225	3675	380	3559	10777
3	316	949	50	1291	3873	400	3651	10956
4	365	1098	55	1354	4062	450	3873	11619
5	408	1225	60	1414	4244	500	4082	12248
6	447	1347	65	1472	4416	600	4472	13416
7	483	1449	70	1527	4583	700	4830	14492
8	516	1550	75	1581	4743	800	5164	15492
9	547	1643	80	1633	4899	900	5477	16431
10	577	1733	85	1683	5051	1000	5773	17321
11	605	1817	90	1732	5196	1100	6055	18167
12	632	1898	95	1779	5339	1200	6324	18974
13	658	1976	100	1826	5478			
14	683	2054	110	1915	5745			
15	707	2121	120	2000	6000			
16	730	2192	130	2081	6245			
17	753	2259	140	2160	6482			
18	774	2324	150	2236	6708			
19	796	2388	160	2309	6930			
20	816	2450	170	2380	7142			
21	836	2510	180	2450	7348			
22	856	2570	190	2516	7550			
23	875	2627	200	2582	7746			
24	894	2684	220	2708	8124			
25	913	2739	240	2828	8486			
26	931	2793	260	2886	8660			
27	948	2846	280	2944	8832			
28	966	2898	270	3000	9000			
29	983	2949	280	3055	9165			
30	1000	3000	290	3109	9327			
32	1033	3099	300	3162	9488			

Circular Memorandum

Your attention is drawn to the fact that in filling in the forms of application for land and transfer forms, sufficient attention is not always paid to giving an adequate description and diagram of the boundaries and locality of the land referred to in those documents. The details supplied should be sufficient to enable a stranger to proceed to and identify the locality, area and shape of the land with some accuracy. To do this, the starting point should always be carefully and permanently fixed by marking a tree and planting a stout post well into the ground at that point, the compass bearing and distances from tree to post being taken and noted. The bearing and distance should be ascertained, as approximately as may be possible, from some point or points on the boundaries of the land in question to some other known survey; or, failing that, to some well known point such as a cape, island, river, village or place in the latitude and longitude maps. If that cannot be done, it will at least be possible to give the approximate latitude and longitude as taken from the maps. Applications from the public should not be forwarded for

for approval before any endeavor has been made to obtain such a description of the land applied for as fulfils these conditions so far as is practicable, especially as regards marking the starting point.

H. H. Stewart Russell

C. S.

9.2.1900

The Assistant Res. Magistrate
Panama
and Eastern Division.

SURVEY TOPICS

Mick Larmer wasn't sighted on the night of the Congress Dinner as he felt his condition was not capable of improvement. His apologies to all.

Not too sure whether Clive Sparkes-Carroll was eating that Claret or drinking the Oysters, but was seen next week at the Papua Yacht Club ordering Oyster Shandy on the rocks.

T.C.J. won his stirrer's paddle through sheer hard work and effort in his chosen field of endeavour - Rowing.

The grapevine has it that another Survey Firm has purchased a Gak 1, and will meet Dan Fitzhenry on Ela Beach at high noon, that is 'if the Brisbane Customs allow it.

Sid Dahl gave the Congress tremendous publicity on his ham radio - even Russia, and caused a riot with his 'sexometer' at the Cocktail party.

Bruce Willington and Jack Edmonstone are running a traverse from Mackay to Surfers Paradise and expect to finish in 197---?

Jason Garrett caused a stir with his photos. Is he an amateur photographer?

A Land's Surveyor patiently explained to yours truly at a Xmas Ding that the Stock Exchange was the only place to invest money and get the maximum return. When queried as to how much profit would be forecoming if he sold all his shares he explained that he couldn't sell as the prices were too low.

Nice photo of Mike Kellock at the Congress Dinner. Even nicer one of his feminine friend.

Ian Johnson has left the Territory for the high seas and we all wish him well.

Brian Mennis has moved to Mt. Hagen as Acting Principal Surveyor while Maurie Whish Wilson is in the Chair at Head Office.

Mal Gray is back from leave after enjoying the sunshine of his home town N.S.W. with two new additions to family (Twins yet).

Tony and Marianne Skehan have a new arrival - a baby girl.

Congratulations to you both.

John Williams has promised to beat anything that Moresby has done. Best of luck John.

John Pike and Graham Matheson have joined the Air Force Reserve as test pilots on air to ground projectiles.

Clive and Jeanette Sparkes-Carroll have recently returned from leave in Australia.

Gil Hole has completed his boat and has called it "Konemanu". Challenges have been received from Mick Larmer, Ken Matheson, Graham Matheson and Ray Belton, for King of the Harbour but my money is on Larmer.

Clive Bassett and Graeme Sparkes-Carroll have bought a Corsair sailing boat and have been braving the elements at the Papua Yacht Club.

Maurie Whish-Wilson and Ray Belton have been seen thrashing each other on the squash court. May the best man win.

Peter Zwart has left the premier city of the Territory. He is now Manager of Qasco in Sydney. One beautiful place to another.

Brian Digby has been appointed the Registrar to the Board of Surveyors.

George Gruska has gone finish and Jim Bounds has taken his place at Murray Barracks. Welcome to the Territory Jim.

The Stirrer was presented with his own instrument of torture at the Lands Dept. Xmas Party. It is portable but large enough to be put to its best use by the Champion of the Cause. Mick Larmer said it cost too much.

SLAVE OF FEES

The Survey Congress in Lae certainly stimulated thought and ideas concerning the Surveyor's role in the future needs of this Country.

Our ideals can only progress to a satisfying future with a determined effort from all concerned.

The Surveyor, as the ground breaker, must necessarily bear the load of initiating development and producing correct and relative information. He is continually responsible for supplying data to expend a fortune each year. He must be able to mobilise his efforts and produce the results in the most efficient manner.

If we believe this then our worth to the Community is invaluable, be it through training, administration or field, our efforts collectively are considerable.

A media of our profession, the Scale of Fees, is one direct relationship, amongst others, that we have with the public.

With the high cost of capitalisation in a Survey Practice, the public tend to discount other values except the times spent on a survey.

If our guiding line "Is it fair to all concerned" be applied then it is up to us to justify our efforts.

The public's image of the Surveyor will be the direct result of our consideration for the public.

G. ARMAN
EDITOR

THE SELF WINDING PLUMBBOB

THE self winding plumbob, although a thing of the past, may still be found in the country Surveyor's kit, although perhaps used only as a conventional plumbob.

The self winding plumbob was invented in Sydney about 60 years ago and proved very convenient and time saving, especially for use in country surveys, however the undue wear on the string due to spring tension and the difficulty of renewing the string caused a decline on the use of these plumbobs.

The writer, who bought one in 1910, has overcome the difficulties referred to by dispensing with the spring and converting the plumbob into a manual winding one. A steel spindle goes through the middle of the plumbob and has a small brass nut on each end, one to wind and the other to clamp. The spindle has a squared section in the middle to fit the string winder, and the other squared section to fit the winding nut. A small pin at the threaded end of the spindle prevents loss of the clamping nut. This plumbob can be readily adjusted and clamped to the maximum height as required when setting under a wad stick.

It is hoped that this information may be useful to those Surveyors who still have the patent plumbob and would like to convert it as described above.

Signed - Mark Olidoit

NAME GUESSING COMPETITION

Mr. Sid Dahl of Lae has sent a reply to the competition as listed in the previous journal. Various replies led to confusion of the personalities involved and their respective aliases. However Mr. Dahl thinks that the aliases as listed below are correct.

Golliwog - Mike Kellock
Goldilocks - Ian Johnson
The developer - Tom Richards
The Man from Uncles - Tom Jackson
The Law Maker - Jason Garrett
The Shah of Persia - Errol Deller
Sleepy Eyes - Peter Jolly
Rain Lover - Geof Brown
The Kikori Kid - Mick Larmer
The Pied Piper - John Williams
Yogi Bear - Ossie Dent
Simon & Garfunkal - Brian Mennis & Des Husband
007 - Jim Roberts
The Rope - Graeme Arman
The Cow Cocky - Ken Blaik
The Stirrer - John Macartney
The Piler - Graham Matheson
Squeaky - Dan Fitzhenry

As there were no correct entries the bottle of Scotch was consumed by the Editor and Sid Dahl.

We thank all Members for their contributions to this competition.

Dalai Drafting Service

Residential — Industrial — Commercial — Civil Engineering
Survey — Contract Drafting

Contact John Farrow

Phone 53292

Box 4017, Badili

PERSONALITY OF THE PROFESSION

Robert Graham Matheson F.I.S. (Aust.)
M.A.S. P.N.G.

It has been brought to our attention that the Surveyor General of Papua and New Guinea, Mr. R. G. Matheson has been accepted as a Fellow of the Institution of Surveyors of Australia.

Mr. Matheson, who comes from a long family line of Queensland Surveyors, has been in the Territory since 1951 and since 1962 has been Surveyor-General of this country.

During that time Mr. Matheson has brought the Surveying profession in this country from its infancy to a place of undisputed recognition and a valued and respected place in our society.

His administration and policy making, his thought and demeanour and his undoubted integrity have been an asset that we can never replace.

If ever a man sat on both sides of the fence and looked straight down the middle it was Graham Matheson.

The Association owes Graham Matheson a debt it can never repay except to say "Thank you".

On behalf of the Association we extend our congratulations to you for a good job well done. Your elevation to Fellow is well deserved and we hope you will serve us in the future as you have in the past.

CORRESPONDENCE

25th October, 1970

The Editor,
The Journal of the Association of Surveyors
of Papua and New Guinea.

THE "STIRRER" STRIKES AGAIN.

Your article "WONEM IMNAU" in the July, 1970 issue of the Journal of Association of Surveyors of Papua and New Guinea has forced me to extract an auxiliary paddle; (you will recall that I lost the right to possession of the official paddle at the last Congress), from my private supply and once again attempt to get my message across regarding size and usage of concrete pegs.

Obviously you are referring to the marking of cadastral surveys so I would like to explain that what I was taught were the basic reasons why a "Licensed", "Registered" or "Authorised" Surveyor was effecting a cadastral survey. A perusal of many plans presented to the Lands Department and several field inspections have revealed to me that many of the Surveyors in the Territory were not taught at the same school. The basic reasons taught to me were:

(a) The surveyor marks the boundaries of a parcel or parcels of land by adequate monumentation, reference trees and clearing of lines in such a manner that a person other than a Surveyor can easily and positively identify such parcel or parcels of land. Permanent Survey Marks, Reference Marks etc. are of academic interest to the surveyor or his successors so that should the original boundary marks be destroyed, new marks may be placed in the exact position of such missing marks, i.e. the original boundaries may be easily and accurately re-instated.

(b) The Surveyor by some means determines the location, shape and size of the parcel of land so that it can be delineated and entered in some register and a title or lease issued to the party who has an interest in the land. Such register is

generally kept by a Government instrumentality and titles issued have the instrumentality's guarantee or backing.

Procedures (a) and (b) above would appear to be very simple and in the Territory, the Surveyor-General has published "Survey Directions" as to how they should be effected. From my perusal of plans submitted, I wonder how many surveyors have made a comprehensive study of these "Survey Directions".

However, back to the point in question, namely sub-paragraph (a) in this letter and the type of monument to be used. I agree with you that no matter how large or of what materials the pegs are constructed of, they will always be subject to removal or destruction. As a case in point one of the Border survey marks, which each consist of 3 tons of re-inforced concrete, has reputedly been broken. Also on two occasions, bridges in Melbourne have been subject to "disturbance"!! What is required is a monument that positively identifies the boundaries of the parcel of land, is durable and its cost is economically within reasonable limits. Discussing these problems individually we have

(a) Monumentation that positively identifies the boundary.

Some years ago, after a long battle, I convinced the Surveyor-General that there should be some distinction between a "line peg" and a "corner peg", particularly in rural surveys. He decided that a concrete peg in the shape of a frustum with a two inch by two inch top and a four inch by four inch bottom be used as line pegs and that the standard 4"x4" pegs be used on corners. This system was also introduced on urban surveys where allotment boundary pegs were to be 2"x2" and section corners 4"x4" pegs. The purpose of this exercise, was to distinguish line pegs from corner pegs, to enable more pegs to be carried at one time, to reduce the cost of survey marks and most important of all to clearly

distinguish a boundary corner. These 2"x2" pegs were to be suitably reinforced which the 4"x4" pegs are not.

After some two years of operating with 2 x 2 pegs, the matter was raised at an Annual General Meeting of the Association and it was resolved that the Surveyor-General be requested to do away with the 2"x2" pegs, which he did. Unfortunately because of work commitments I was unable to attend that meeting and listen to the "pros and cons" put forward; but I think "cons" were simple matters such as; the inconvenience of having to construct two types of pegs, involving two types of moulds; the 2"x2" is not strong enough; the general public is used to 4 x 4 pegs; the 2 x 2 would be difficult to find etc. The strength of concrete is not so much in the size but in its composition and there are still many 2"x2" pegs in Papua, placed in the 1930's, that if kicked would break your foot before themselves breaking. If one is close enough to see a 4"x4" one must surely also see a 2"x2". The Germans in New Guinea used varying sized pegs from 12"x12" down to 4"x4" and the public recognises them as being boundary pegs. We also have the official distinguishing mark of the broad arrow.

Recently a Registered Surveyor wanted to run out a straight line of O.C.P's, (put in on a survey no more than two years old,) by stadia methods so that he would know when he reached the corner peg. Had the line pegs been 2"x2" and the corner peg 4"x4" he would not have had this problem. If a surveyor has this problem how the h--- does the poor citizen not skilled in the ways of surveying, cope? Needless to say his request was knocked back.

Now we have the position where the Surveyor-General has approved the size of 2"x2" wooden pegs on large town sub-divisions. Have I heard loud cries of disapproval from members of the

Association; no, not a word, in fact only comments of approval.

My only comment on the whole matter and how the minds of certain members of our Association must work is "Mi no Savi Masta".

(b) Survey and Plans.

My only comment in this regard is, that, whilst in the Territory of Papua and New Guinea a Surveyor will do his field work and plan compilation in accordance with Directions issued by the Surveyor-General of this Territory. Surveyors coming from other countries should make themselves thoroughly familiar with these Directions and if difficulty is experienced in interpretation of certain parts of the Directions, get the Surveyor-General to clarify the procedure before submitting the survey done in a manner which may be acceptable to a Surveyor-General in another country but not here.

Finally I believe the cost of cement pegs not a significant figure when compared with the overall costs of survey, but could be reduced by the introduction (again!) by 2"x2" cement line and allotment pegs as well as 2"x2" wooden allotment pegs.

J.C. MACARTNEY

(A Surveyor, thought capable to practise his profession by the Board of Surveyors, should not be bound by "Rules and Directions" if he is prepared to accept the responsibility to his client) ED.

The President,
The Assocn. of Surveyors of Papua and New Guinea,
P.O. Box 5056,
BOROKO. T.P.N.G.

Dear John,

It was indeed a pleasure and I must say an unexpected surprise, to get your letter and enclosure of the 30th July. Please accept my apology for not writing before.

I am indeed honoured to be a member of the "Tie Club" and I only hope that at some future date I will be able to be present at another meeting and see if I can again perform the special act in the manner appropriate.

As you probably know we have been given the O.K. to form a Division of the Institution here in Darwin and I have been nominated interim Secretary. We hope to have the Division formed so that it will be suitably honoured at the Hobart Congress. I trust I will see a member of "our" association in T.P.N.G. there.

Again many thanks for the "Tie".

Yours sincerely,
(Bruce Sharp)

The Editor,
The Journal of the Association of Surveyors of
Papua and New Guinea,
PORT MORESBY

Dear Sir,

On behalf of Mick Larmer and myself I wish to deny that we recovered ten cartons of greenies and got them ashore. In actual fact we saved eight cartons as the other two were lost in the surf which caused much wailing and gnashing of teeth.

We trust we have not started a new cargo cult in the Gulf District with greenies being washed up on the beach.

Yours faithfully,
Geoffrey C. Brown.

This article is reproduced from the 'museum' of J. C. Macartney for its historical interest.

Head Surveyor Backs Tolais In Land Row

The president of the Australian Institute of Surveyors, Mr. R. J. Love, this week supported the land claims of the Tolai people in their dispute with the Government Administration at Rabaul, New Britain.

He said that he believed that the disputed land should be given back to the native people.

Mr. Love is also vice-president of the Commonwealth Association of Surveying and Land Economy and Head of the Department of Surveying, Royal Melbourne Institute of Technology.

He was speaking in Townsville during a tour of New Guinea Northern Australia and Queensland.

He said the basis of the land tenure trouble went back to the time of German occupation of the Gazelle Peninsula.

"The Germans took from the people of New Britain some land which the Germans say they paid for."

"They may have, perhaps with beads, a jug of wine."

"But there is no registered document which states that money was paid."

"Now some of the young men have had the benefits of education, they have been taught to think and can appreciate what has developed."

"They say the land is theirs, that there is no record of purchase, and the land should be given back to them."

"They have a very good case," he said.

Asked about the question of independence for New Guinea, Mr. Love

said he believed New Guinea would be in chaos within five years if the present policy of independence at any cost continued.

"I do not believe New Guinea will be ready for independence for 200 years, until they have truly assimilated education and the ability to negotiate with other countries," he said.

TOO EARLY

"Most African countries are in a mess because independence came too early for them."

"It is impossible to take a people who have sprung suddenly from abysmal ignorance and change their culture overnight."

"The number of natives now receiving education in New Guinea would not be one per cent."

"There is an impossible situation being forced on the Administration by the United Nations dictating independence for such territories as soon as possible."

"The cost to Papua-New Guinea could be very, very great — everything that has been achieved could disintegrate," he said.

He said he did not believe anyone really knew what the situation would be in New Guinea in the event of the country becoming independent.

The Association of Surveyors of
Papua and New Guinea

P.O. Box 5056,
BOROKO, Papua,
T.P.N.G.

17th October, 1970

The Editor,
The Australian Surveyor,
The Institution of Surveyors, Australia,
65 York Street,
SYDNEY, N.S.W. 2000

Dear Sir,

Press Release by the President of the
Institution of Surveyors, Australia
following his visit to T.P.N.G.

My Association was disturbed to read, and hear
on the A.B.C., details of a press release by the
President of the Institution of Surveyors, Aust-
ralia following his visit to this country.

While it is realised that Mr. Love may have
been misreported the actual press report did con-
tain several errors of fact, and in any case was
most inappropriately timed.

Members of our profession were at that time
closely involved in the Gazelle Peninsula dis-
pute, which was one of both boundary and title,
and naturally were expected to maintain a com-
pletely impartial attitude in our duties. Little
purpose would be served in going into detail here
on the errors and misconceptions in the report
but my Association would like to publicly disass-
ociate itself from the whole of Mr. Love's press
release.

I would appreciate it if you would publish
this letter in the next edition of "The Australian
Surveyor".

Yours faithfully,
(J.C. MACARTNEY)
PRESIDENT

.....

ADDRESSES OF MEMBERS OF THE ASSOCIATION OF
SURVEYORS OF PAPUA AND NEW GUINEA, AS AT
8TH JANUARY, 1971

CORPORATE MEMBERS:

ARMAN, G.G.D.	P.O. Box 372, Port Moresby, Papua.
BACKHOUSE, D.C.	10 Mark Street, Colac, Vic. 3250.
BASSETT, A.C.	P.O. Box 1026, P.O., Boroko.
BLAIK, K.T.	C/- Department of Lands, Konedobu, Papua.
BOATWRIGHT, G.E.	P.O. Box 101, Popondetta, Papua.
BROUGHTON, S.J.	C/- Department of Surveying, University of Queensland, St. Lucia, Qld. 4067.
BRYNING, I.B.	P.O. Box 472, Lae, N.G.
BUCKLEY, D.M.	P.O. Box 84, Popondetta, Papua.
CALLAGHAN, G.C.	C/- City & Rural Surveys, 25 Barrack Street, Perth. W.A. 6000.
CASPERS, E.J.	C/- Division of Nation 1 Mapping, Derwent House, Hobart Place, Canberra, A.C.T. 2061.
COCKS, G.J.	P.O. Box 328, Haymarket, N.S.W. 2000.
DAHL, O.S.	P.O. Box 387, Lae, N.G.
DAWSON, J.H.	P.O. Box 238, Mt. Hagen, N.G.
DELLER, E.J.	P.O. Box 268, Mt. Hagen, N.G.
DENT, O.G.G.	C/- Department of Lands, Lae, N.G.
DONOVAN, K.J.	30 Victoria Square, Ashfield, N.S.W.
DUNCAN, C.B.M.	P.O. Box 5339, Boroko.
DUNLOP, R.D.	1/73 Mount Street, Coogee, N.S.W. 2034.
FARRELL, M.J.	P.O. Box 376, Madang.
FITZHENRY, D.S.	P.O. Box 1229, Boroko, Papua.
FORSTER, B.C.	P.O. Box 793, Lae, N.G.
GALLAGHER, M.A.	P.O. Box 421, Rabaul, N. .
GARRETT, J.J.	P.O. Box 376, Madang, N.G.

GEORGE, R.L.
 GRAY, M.E.
 GUDGIN, A.R.
 GUNN, C.S.
 HARD, C.W.
 HARDY, A.W.K.
 HARRIS, J.M.
 HARRISON, D.C.
 HENRY, R.W.
 HILL, J.E.
 HODGE, E.J.
 HOLE, G.R.
 HUSBAND, D.M.
 JACKSON, G.R.
 JACKSON, T.C.
 JAY, L.
 JOHNSON, I.
 JOLLEY, P.E.
 KARL, H.
 KELLOCK, M.D.
 LARMER, M.J.
 LAWSON, J.V.
 LEET, N.T.
 MACARTNEY, J.C.
 MCCARTHY, A.J.
 McLELLAND, G.H.
 McLAUGHLAN, B.J.
 McLENNAN, B.R.
 MAIL, A.J.
 MATHESON, K.ST.C.
 MATHESON, R.G.

P.O. Box 201, Mt.Hagen, N.G.
 C/- Department of Lands,
 P.O. Box 5056, Boroko, Papua.
 P.O. Box 522, Port Moresby.
 3 Lynch St. Young, N.S.W.2594.
 P.O. Box 143, Kieta, Bougainville.
 P.O. Box 5056, Boroko.
 P.O. Box 288, Goroka, N.G.
 P.O. Box 1745, Boroko, Papua.
 P.O. Box 143, Kieta, Bougainville.
 15 Turner Street, Kalgoorlie,
 W.A. 6430.
 C/- White, Hosford & Impey,
 Whitehorse, Yukon, Canada.
 C/- P.W.D., P.O.Box 1108,
 Boroko, Papua.
 P.O. Box 535, Rabaul, N.B.
 C/- Department of Lands,
 Mt.Hagen. W.H.D.
 P.O. Box 1611, Boroko, Papua.
 P.O. Box 619, Lae, N.G.
 P.O. Box 793, Lae, N.G.
 P.O. Box 268, Mt.Hagen, N.G.
 C/- District Office, Kokoda.
 C/- P.O. Box 779, Lae, N.G.
 P.O. Box 372, Port Moresby,
 Papua.
 27 Adelaide Street, Brisbane,
 Qld., 4000.
 P.O. Box 421, Rabaul, N.B.
 C/- Department of Lands,
 Konedobu, Papua.
 P.O. Box 580, Lae, N.G.
 P.O. Box 113, Nelson Bay,
 N.S.W. 2315.
 P.O. Box 403, Madang, N.G.
 P.O. Box 535, Rabaul, N.B.
 P.O. Box 264, Port Moresby,
 Papua.
 P.O. Box 1036, Boroko, Papua.
 P.O. Box 1036, Boroko, Papua.

MENNIS, B.J.
 MIDGLEY, A.J.
 MUDGE, P.H.
 MULLER, M.J.
 NAUGHTON, A.E.
 NICKLES, W.L.
 OLIVER, N.
 OWERS, N.
 PALAITIS, E.
 PALMER, I.R.
 PIKE, J.G.
 RAMPANT, L.W.
 RICHARDS, T.W.
 ROBERTS, J.R.
 SCARFE, K.M.J.
 SCRIVEN, S.
 SHARP, B.
 SHEEDY, P.J.
 SHEPHARD, A.A.
 SKEHAN, A.J.
 SMITH, D.H.
 SMITH, D.T.
 SPARKES-CARROLL, G.
 SPARKES-CARROLL, C.W.
 SWIFT, D.M.
 TAYLOR, R.D.
 TIERNEY, J.J.
 TOMKINSON, P.T.
 VETTER, A.J.
 WHISH-WILSON, M.G.
 WICKENS, T.J.
 WILLIAMS, J.C.

P.O. Box 61, Rabaul, N.B.
 P.O. Box 605, Rabaul, N.B.
 P.O. Box 376, Madang, N.G.
 P.O. Box 1036, Boroko, Papua.
 P.O. Box 793, Lae, N.G.
 P.O. Box 634, Port Moresby,
 Papua.
 P.O. Box 47, Mendi, Papua.
 C/- N.G.G., Wau, N.G.
 P.O. Box 47, Mendi, Papua
 C/- Swanbourne Institute of
 Technology, Melbourne, Vic.
 G.P.O. Box 907M, Brisbane,
 Qld., 4000.
 P.O. Box 605, Rabaul, N.B.
 P.O. Box 387, Lae, N.G.
 P.O. Box 288, Goroka, N.G.
 P.O. Box 1229, Boroko, Papua.
 C/- Department of Lands,
 P.O. Box 535, Rabaul, N.B.
 42 Chrisp Street, Rapid Creek,
 Darwin, Nthn. Territory, 5792.
 P.O. Box 260, Tamworth, N.S.W.
 2340.
 321 Kent Street, Sydney, 2000.
 P.O. Box 372, Port Moresby,
 Papua.
 P.O. Box 1349, Boroko, Papua.
 P.O. Box 143, Kieta, Bougainville.
 P.O. Box 5056, Boroko, Papua.
 C/- Department of Lands,
 Konedobu, Papua.
 P.O. Box 5042, Roturua, New
 Zealand.
 P.O. Box 1720, Boroko.
 P.O. Box 1036, Boroko, Papua
 C/- Department of Lands,
 Surveys & Mines, Lae.
 P.O. Box 387, Lae, N.G.
 P.O. Box 201, Mt.Hagen, W.H.D.
 P.O. Box 1041, Boroko, Papua.
 P.O. Box 1, Rabaul, N.B.

WILLINGTON, B.H. 18 Broadbent Street, Scullin,
A.C.T. 2614.
WOOD, J.R. P.O. Box 47, Mendi, Papua.
WORDSWORTH, L.W. 3 Lynch Street, Young, N.S.W.
2594.
WRIGLEY, B.W. P.O. Box 85, Kundiawa, N.G.
YOUNG, E.H.L. 48A Wells Road, Mordialloc,
Vic. 3195.
YOUNG, R.W. P.O. Box 472, Lae, N.G.
ZWART, P.R. P.O. Box 1395, Boroko, Papua.

ASSOCIATE MEMBERS:

ASCHHOFF, K.F.J. P.O. Box 535, Rabaul; N.B.
BAKEWELL, R.C. 12 St. Faiths Road,
Montmorency, Vic. 3094
BALE, A. P.O. Box 5056, Boroko, Papua.
BROWN, G.C. P.O. Box 517, Port Moresby,
Papua.
CICHOCKI, M.F. P.O. Box 5056, Boroko, Papua.
ERBEN, M. C/- Department of Lands,
Konedobu, Papua.
GRUSZKA, G. Capt. S.O. Svy. P.N.G. Command,
Murray Barracks, Boroko, Papua.
JOHNSTON, D. Free Bag, Post Office, Boroko,
P.O. Box 417, Port Moresby,
Papua.
KENDALL, G.D. P.O. Box 535, Rabaul, N.B.
KRONENBURG, J. P.O. Box 5083, Boroko, Papua.
McVEAGH, G.F.B. 37 McArthur Avenue,
Warrandale, S.A. 5046.
PAPAI, J.M. P.O. Box 793, Lae, N.G.
PATERSON, G.L. P.O. Box 2693, Djakarta,
Indonesia.
POCHAPON, K. P.O. Box 403, Madang.
RUMBLE, D.C. P.O. Box 387, Lae, N.G.
SALAIAU, P. P.O. Box 403, Madang.
STEENKEN, H. P.O. Box 387, Lae, N.G.
STREETER, R.L. P.O. Box 268, Mt. Hagen, N.G.
TAYLOR, D.J. P.O. Box 103, Lae, N.G.
WRIGLEY, R.M. P.O. Box 1229, Boroko, Papua.

STUDENT MEMBERS:

EDMONSTONE, J.G. C/- Division of National
Mapping, P.O. Box 667,
Canberra City, A.C.T.
DIGBY, B.R.M. P.O. Box 279, Port Moresby,
Papua.

SURVEY DRAFTSMEN

PLAN DRAWING SERVICE PTY. LTD.

ERIC IRELAND

BOX 593, PORT MORESBY. PHONE 44389

As Agent for the Dept. of National Development and for
British Solomon Islands Protectorate, we stock topographic
maps of T.P.N.G., B.S.I.P. and West Irian.
— Catalogue of key maps \$2.00 —

PIONEER

Office & Scientific Supply Pty. Limited

IN SURVEY

IN THE FIELD

We have a selection of Zeiss Jena optical instruments, from optical squares through automatic levels to theodolites and interpretation equipment.

IN THE OFFICE

The myriad of computations involved in survey can be accurately and quickly solved with Olivetti computers and calculators. The P203 computer can tabulate input data and results directly in a form acceptable to your customer, and produce punched tape for electronic data processing (E.D.P.).

IN THE TYPING POOL —

A selection from our range of typewriters and proportional spacing machines will give your reports that crisp, clear, professional look.

CUSTOMER PRESENTATION

To give your reports that final customer appeal, ask to see our range of G.B.C. coloured covers, punching and binding equipment and plastic film laminators.

YOUR RECORDS

We shall be pleased to quote you on electro-static copiers, micro-film equipment and data-processing equipment.

Ring or write your nearest PIONEER centre and ask a representative to call.

LAE

Telephone: 2626
Write: P.O. Box 387

PORT MORESBY

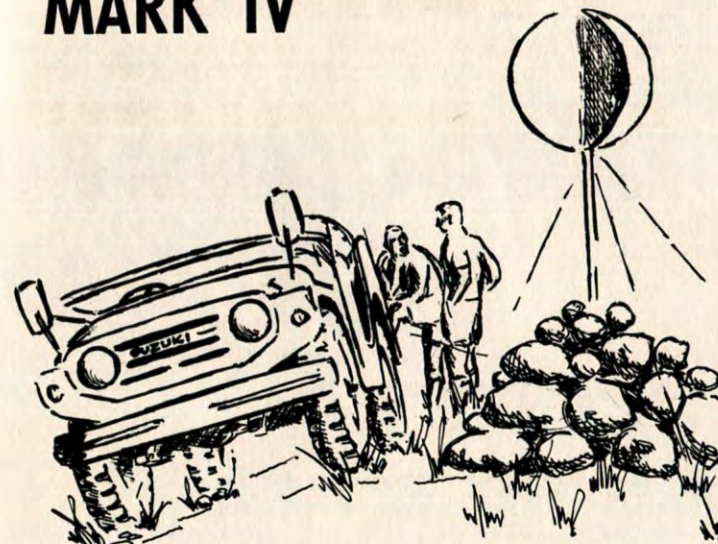
Telephone: 3181
54780
Write: P.O. Box 3144

Telegraphic "Pioneer"

KIETA

Write: P.O. Box 21

SUZUKI BRUTE MARK IV



For your next expedition — the Suzuki Mark IV.

The rugged little buggy with room for two friends, or one friend and 549 pounds of gear.

A one-touch lever shifts from rear-wheel drive to four-wheel drive for making tracks through sand or mud, while the big knobby tyres provide great traction. The four-speed, wide-ratio transmission has full synchromesh operation, and the four-wheel drive comes with both low and high gear ranges. The Suzuki Brute Mark IV will make easy work of the steepest grades.

The windshield will tip forward and the convertible cloth top gives protection from sun or rain.

At \$1875 the Suzuki must be the cheapest, most rugged, four-wheel, all-condition vehicle in the Territory.

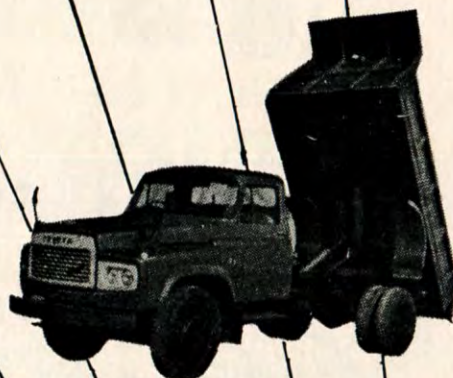


See your local

Tutu Bryant Pacific Limited

Branch for details

The pure
strength
of



TOYOTA
dump truck



THE FASTEST,
MOST EFFECTIVE

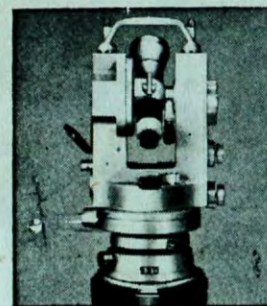
ELA
MOTORS LIMITED

THE NO. 1 NEW AND USED TRUCK DEALERS IN THE TERRITORY
For Personal Service:
Port Moresby
Brian Davies
Dennis Gordon
Phone 54088
P.O. Box 75

Lae
Terry Mooney
Phone 8086
P.O. Box 91

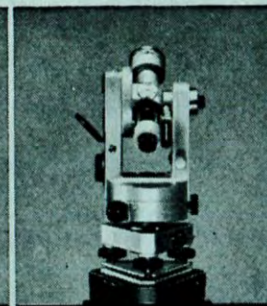
Rabaul
Bobby Barrett
Phone 3281
P.O. Box 712

Kieta
Jack Wardman
Phone 143
P.O. Box 171



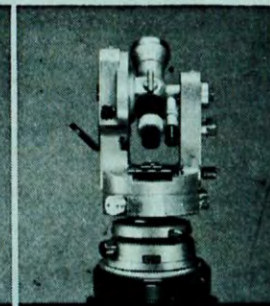
Th2

Second-reading theodolite with coaxial controls, long compensator for vertical-circle indexing, and far-reaching digitization of readings.
30x40 terrestrial telescope (erected).
Nominal accuracy: $\pm 1''$



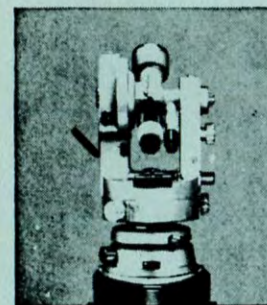
Th3

Light-weight theodolite with micrometer, for wide range of application, with automatic vertical circle indexing.
25x35 astronomical telescope (inverted).
Nominal accuracy: without repetition $\pm 3''$ with repetition $\pm 1''$



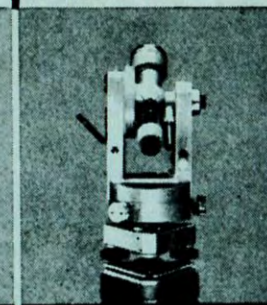
Th42

Engineer's optical-scale theodolite with large intervals and long compensator for vertical indexing.
30x40 terrestrial telescope (erected).
Nominal accuracy: $\pm 3''$



Th4

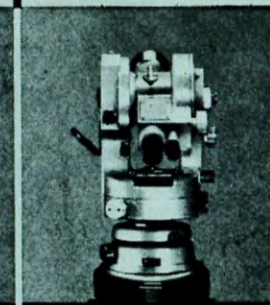
Engineer's optical-scale theodolite with large intervals and long compensator for vertical indexing.
25x35 astronomical telescope (inverted).
Nominal accuracy: $\pm 3''$



Th5

Simple theodolite for the building site and tacheometric measurements.
25x35 astronomical telescope (inverted).
Nominal accuracy: $\pm 20''$

CARL ZEISS Oberkochen/Württ. (West Germany)



RTa4

Reduction tacheometer for vertical rod, with fixed arrangement of curves, close-up and distant measuring ranges.
25x40 terrestrial telescope (erected).
Nominal accuracy (distance): ± 5 cm at 100 m
The optical quality of the ZEISS telescope (F or G-type apochromats) makes this an outstanding line of theodolites.

**Theodolites
and
Tacheometers**

ZEISS

CARL ZEISS PTY. LTD.

569 George Street, SYDNEY. Tel. 61 8901

Branches at Melbourne, Adelaide, Perth

SOLE AGENTS FOR T.P.N.G.

BRECKWOLDT & CO. PTY. LTD.

Rabaul, Port Moresby, Lae, Madang, Kieta, Mount Hagen, Wewak.
STOCKS HELD NI2 & TH4 ENQUIRIES WELCOME



Surveying Instruments

FOR ALL APPLICATIONS



ELECTRONIC DISTANCE MEASURING

DISTOMAT

Range 55 yards to 95 miles.
Digital read out.

LEVELS



For Builders, Surveyors and Engineers. Dumpy, Tilting, Automatic, with or without horizontal circle.



LEVELLING STAVES

Precision Invar,
folding, telescopic
and self computing.



DRAWING INSTRUMENTS

Stainless chromium steel. Individual instruments or complete sets.

GYRO COMPASSES & CLINOMETERS

Prismatic, geological
and boat compasses.



FIELD BOOKS PLUMBOBS RANGING POLES OPTICAL SQUARES

TRUE NORTH INDICATOR

Attachment for
Standard Theodolite.



THEODOLITES and TACHEOMETERS

With full range of accessories. STURDY CONSTRUCTION designed for Compass Traverses, Cadastral Surveys, Triangulation, Building construction, Mining, Topographic and Astronomical applications.

YOUR WILD MAN IN PNG.

BRIAN BELL & CO. PTY. LTD.

TURUMU STREET, BOROKO, P.M.
BOX 1228, BOROKO, PAPUA