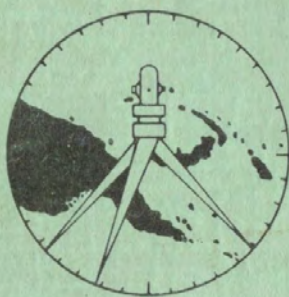


# THE JOURNAL

of the

## Association of Surveyors of Papua New Guinea



VOLUME 4

No. 1

MARCH 1974

THE ASSOCIATION OF SURVEYORS  
OF PAPUA AND NDW GUINEA

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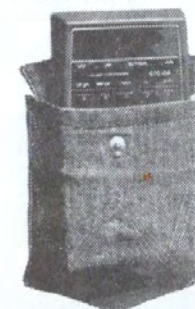
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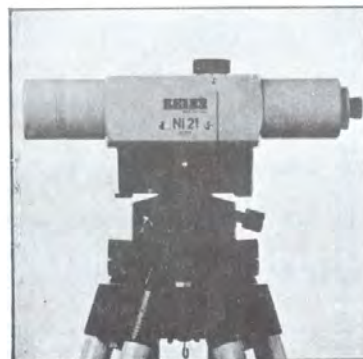
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# The Journal

OF THE

ASSOCIATION OF SURVEYORS OF PAPUA NEW GUINEA

Vol. 4

March 1974

No. 1

Editor and Business Manager

A.J. McCarthy

A volume consists of 4 issues.

Subscriptions: \$2 per single copy  
\$8 per annum.

From the Constitution, By-law 49 states:

- (a) The Official organ of the Association shall be known as the Journal of the Association of Surveyors of Papua New Guinea and incorporated therein until such time as the Council shall otherwise decide shall be the Transactions of the Association being the official record of technical papers presented to the Association and selected for publication, the annual report of the Council, and the audited statements of account.

The Transactions may also include the reports of the discussions of selected papers presented to the Association, the presidential address, and such other matters as may be specially approved.

- (b) The Journal of the Association shall be the medium for the dissemination of information regarding the activities of the Association and for the publication of any matters incidental to the promotion of the objects of the Association.

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The Surveying Profession in Papua New Guinea is experiencing the winds of change more so, probably, than any other country in the world. This situation has arisen because of the recent Commission of Inquiry into Land Matters, and the thoughts and ideas of members of government, and others, as Papua New Guinea rapidly approaches independence.

Unlike older countries where long established traditions make change a painful process, Papua New Guinea is in the enviable position of being able to accept or reject Land Surveying procedures until they are applicable to the present situation.

Over the short period of time of one year the whole emphasis of surveying has switched from a cadastral bias and the licensed surveyor to one of national mapping, project mapping and the other applications of photogrammetry. It appears that the government may virtually demand that nearly all surveying related to measurements for the purpose of land ownership and registration is to be handled by survey technicians. In a similar vein the Department of Public Works is only prepared to sponsor students through the Survey Technician course at the University of Technology.

The government is concerned with the reliance it must place on consulting surveyors to carry out its projects. At the present time the Association is investigating changes to the Scale of Fees, there having been no overall increases since early 1971. Government surveyors, as members of their Departments, are placed in the unenviable position of having to keep survey costs as low as possible, but not create a situation where the private consultant cannot make a reasonable living in the face of spiralling costs. The problem is many faceted. Taking into consideration the bureaucracy, productivity, inefficiency because of size and normal costs, it is, at present, more economical for the government to use consulting surveyors. This is no bad reflection on government surveyors; they provide the expertise needed to watch the government interests. He must be careful though that in enthusiasm to save as much money as possible, he doesn't sell his own profession down the drain. On the other hand the private surveyor is occasionally accused of producing shoddy work and this can be as equally damaging to the profession.

The whole matter must be approached in a large-minded manner with an eye continually to the betterment of our vocation.

Previous meetings have been held this year on February 6, February 21 and April 10. The next meeting is scheduled for May 26 in Port Moresby at Jeff Tierney's residence.

Looking through the minutes of the previous meetings the main items which have been under discussion are as follows:

Changes to the Scale of Fees.

The Ninth Survey Congress to be held on Bougainville.

The Constitution.

Applications for membership, and changes in grade of membership.

The Journal.

Changes to the Scale of Fees are still not completely resolved with the major clients of the consultants.

The matters which, it is hoped, will be finalised at the next meeting are the proposed government scale of fees for photogrammetric services and reasonable rates for some geodetic, topographic and astronomy calculations.

Preparations for the Ninth Survey Congress are now well under way and the Committee are very pleased with the number of pre-registrations already received.

At the next meeting of Council it is proposed to investigate ways and means of giving financial assistance to the conference, as a compensation for the extra expense of registrants travelling to Bougainville.

Undated copies of the Constitution will be available by the time of publication of this issue of the Journal. All new members will be forwarded a copy, and existing members may apply to the Secretary if they require a new copy.

A copy of the Minutes of the previous A.G.M. is included in this issue for Members to read in preparation for the coming A.G.M.

To date eighteen new members have been accepted by the Association and there has been one resignation. It is hoped that all the third and fourth year surveying students at the University of Technology will opt to join as student members.

It has been noted that issues of the Journal are behind date and a concerted effort is being made by the editor to rectify this matter. The editor is also attempting to bring to the members and other readers a wide cross section of surveying information in Papua New Guinea. Members are requested to give every assistance to make our Journal a better publication.



MINUTES OF THE 14TH ANNUAL GENERAL MEETING  
OF THE ASSOCIATION OF SURVEYORS OF PAPUA NEW GUINEA  
HELD IN LAE ON THE 20TH JULY, 1973

Members Present: Messrs. M.J. Larmer (Chairman); J.J. Tierney (Hon/Sec); J.J. Garrett; R.G. Matheson; G.C. Brown; G.R. Hole; O.G. Dent; G.G. Bateman; M.F. Cichoki; G.D. Kendall; T.W. Richards; C.H. Carson; M.J. Page; A.W. Laing; S. Scriven; N.J. Sharp; A.J. McCarthy; M.J. Muller; A.C. Bassett; D.S. Fitzhenry; N.T. Leet; L. Tabua; S.P. Low; F.P. Posanau; A. Bale; D.C. Forster; N.J. Bowden; P.D. Fagan; G.V. Saunders; P.H. Mudge; A.E. Naughton; P.E. Jolley; A.J. Skehan; B.C. Forster; D.T. Smith; A.J. Cullum; B. McLennan; K. Pochapon; B.J. Mennis; G. Sparkes-Carroll; K.J. Donovan; G. Thompson.

Associates and Observers:

C.M. Leng; K.F. Aschhoff; E. Van Hecke; P. Breria; J.A. Sipuman; F.L. Lee; E.E. Gardiner.

AGENDA ITEM NO. 1 - CONFIRMATION OF MINUTES OF 13TH ANNUAL GENERAL MEETING

Moved: G.C. Brown.

Seconded: A.J. McCarthy.

that the Minutes of the 13th Annual General Meeting be confirmed.

MOTION CARRIED.

AGENDA ITEM NO. 2 - BUSINESS ARISING OUT OF MINUTES

a) Base Line

Mr. Mennis advised that the Division of Weights and Measures within the Department of Labour had advised him that plans were on the drawing board; but that the delay was caused by lack of finance from P.W.D. Mr. Mennis contacted then Mr. Hole who advised that finance was in fact available. The meeting resolved to take the matter up again before the next Meeting.

b) Scale of Fees

Mr. Larmer raised the matter of the Annual review of the Scale of Fees suggested by Mr. Hard at the 13th A.G.M. He advised that no request had been made for a review by Cooper Brothers.

Minutes of the 14th Annual General Meeting  
of the Association of Surveyors of Papua New Guinea

c) Congress Registration

Mr. Posanau queried the cost of Congress Registration Fees.

Mr. Larmer commented that costs were directly associated with the cost of the social functions. If these are to be retained, then Registration Fees will remain at the present level.

Mr. Hole advised that partial registration was available.

d) Grades of Membership

Mr. B. Forster asked if any moves had been initiated to establish any new grades of membership.

Mr. Larmer replied that he expected a Motion to this effect would be tabled later in the Meeting.

AGENDA ITEM NO. 3 - REPORT BY COUNCIL

Mr. Larmer requested Mr. Tierney to present Report by Council.

Mr. Tierney: During the past year 12 formal meetings of Council have been held, all in Port Moresby. Councillor D. Rumble was unable to attend any meeting, and appointed Mr. G. Sparkes-Carroll as proxy.

Resignations - Messrs. J. Macartney and G. Arman replaced by Messrs. K. Blaik and J. Garrett.

Membership - 16 new members, 8 resignations. Total now 137 with 46 overseas.

Sub-Committees - Scale of Fees, Land Laws and Constitutions. Sub-Committees were all active during the past year. Reports by these were made during the Congress.

Seminar - A two-day seminar was held during the year on Fees and Standards. The content of the meeting was still under discussion.

District Groups - The Hagen, Lae and Madang groups have been active during the year. The Rabaul group was not as active as had been hoped.

C.A.S.L.E. - The Association continued active membership of C.A.S.L.E. At the Second General Assembly in Wellington, N.Z., the Association was officially represented by Mr. K. Gudgin. Mr. M. Kellock was also present in his capacity as Head of the University of Technology Surveying Department. Mr. Kellock was appointed to the Surveying Education Sub-Committee.



Minutes of the 14th Annual General Meeting  
of the Association of Surveyors of Papua New Guinea

Association Prizes - Best results in First year - Selan Pembuai  
" " " Fourth " - Edmond Van Hecke

AGENDA ITEM NO. 4 - REPORT OF HONORARY TREASURER AND FINANCIAL STATEMENTS TO 31st DECEMBER, 1972 AND INTERIM FINANCIAL STATEMENTS AT 30th JUNE, 1973.

Mr. Tierney advised that Financial Reports for December, 1972 and Interim Report to 30th June, 1973 had been circulated.

Moved Mr. Hole.

Seconded Mr. Jolley.

that the Financial Reports as circulated be accepted.

Motion carried.

AGENDA ITEM NO. 5 - BUSINESS ARISING OUT OF THE TREASURER'S ANNUAL REPORT AND FINANCIAL STATEMENTS

Mr. Tierney advised that the Honorary Auditor had made the following recommendations:

- a) Advances of cash to be made by the Hon. Treasurer to a nominated person on the Sub-committee controlling the activities;
- b) Council to instruct the Sub-committee to issue receipts for cash received and maintain records of expenditure including copies of accounts paid;
- c) Sub-committees to report to Council at regular intervals as to state of their finances;
- d) The Hon. Treasurer of the Association should, as far as possible, receive no monies and pay no accounts for activities for which the sub-committees are responsible.

AGENDA ITEM NO. 6 - REPORTS OF SUB-COMMITTEES AND DISTRICT GROUPS

Mr. Larmer advised that these Reports had been presented during the Congress.

Mr. Matheson advised that the Association was now a member of the East Asian Regional Organisation for Planning and Housing. He advised further that he had represented the Association at Kuala Lumpur during the EAROP Annual Meeting.

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AGENDA ITEM NO. 7 - PRESIDENTIAL ADDRESS 1973

Mr. Larmer: Gentlemen, Agenda Item No. 7 is the Presidential Address. There are a lot of things I can't do and one of them is to pre-write addresses. I would like license from you people to reword this speech slightly at a later date, as the Presidential Address is normally published in the Journal or in the Minutes of this Meeting or somewhere else and because I haven't prepared anything on paper, whatever I say here will probably be unsatisfactory by the time it is written down anywhere.

I would like to say that it's been a great honour and privilege, and I mean this very sincerely, to be the President of this Association. I don't wish to be repetitive but I can't help but say that I think we still certainly are the strongest professional body in Papua New Guinea. It gives me a great deal of satisfaction to be able to say that and mean it. At this time I was going to speak to you about all the achievements of this Association under my presidency, but I've lost the postage stamp that I had written it all on the back of..... There are two things I think we have probably had to do. The first is the normal administration that is needed to keep the Association going smoothly and in this regard Council certainly performed its functions. We had a monthly meeting and one or two extraordinary meetings, which means we had 13 or 14 meetings since the last Annual General Meeting. The Association certainly preserved the status quo in this regard. The whole thing kept functioning. Possibly a more important aspect would have been innovation as because of the circumstances in this country at this time preserving the status quo is probably no longer good enough. We have got to innovate, we have got to change our ideas to suit Papua New Guinea. We didn't achieve a lot in this regard this last year. We thought about it a fair amount but it's a little hard, mainly because of communication constraints to get a large group of our members to come to any concrete decisions re change of policy, or implement constitutional changes. I rather hope that a little bit later at this meeting, because we do have a quorum and can legally implement ideas which may change certain aspects of our policy, that this will be done. We haven't been able to do it during the year but I assure you that several members have given a lot of thought to in just what direction we are going. I'd like to thank three members of our Association, particularly for the strong support they've given us during the year. I can assure everyone here that these three fellows have been invaluable to the Association. The gentlemen will be named and in my opinion the three strongest workers in our Association this year were Mr. Brian Mennis our Vice President, Jeff Tierney our Secretary and Alan McCarthy our Congress Manager. I don't know whether it is in order or not but I would very much like gentlemen, for you to join me in acclamation for the work these three fellows have done this year.



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of the Association of Surveyors of Papua New Guinea

I haven't got a lot more to say. I would just like to endeavour to stress to our Papua New Guinea brethren that there has been a great amount of work gone into this Association since its inception in 1960. I am very proud of what has transpired, I think a lot of other people are too. I again congratulate the founding fathers, one of which I am not fortunate enough to be, who in 1960 conceived the idea of this Association. I'd like to congratulate everyone of our members who has helped to keep this Association such a strong body and built it up in those intervening years. I do hope that the Papua New Guinea Fellows are also deriving benefits from belonging to this Association. I'm sure they must be. I hope that they realise the legacy they've got and I hope and trust, and knowing a few of our local members as I do, I've got a fair amount of confidence that they will keep this Association going, and I hope that today they will give us their ideas while they are here and advocate policy changes as they see fit. I don't think, however, that any of them should forget what they owe this Association and I again say that I hope and trust they are prepared to take over the running of it and make sure it stays the premier professional body in this country.

Whilst on this matter I'd like for the second time this week to congratulate Alan Bale and Francis Posanau for being elected our first Papua New Guinea councillors, which is obviously a step in the right direction and I trust that they will be active councillors. I further hope that some of the other senior diplomats will give them their ideas so that we're getting a truly Papua New Guinea way of thinking into our Association. Gentlemen, it's now my pleasure to introduce to you - if he needs any introduction and I don't think he does - your new president, Mr. Jason Garrett.

AGENDA ITEM NO. 8 - DECLARATION OF OFFICE BEARERS AND COUNCILLORS  
FOR 1973/4

Mr. J.J. Garrett: Mr. Past President, Gentlemen.... To be President of the Association of Surveyors of Papua New Guinea, is, I believe, an honour. An honour to lead a body of professional men who have contributed and who will continue to contribute time and service to their country. It is an honour you have placed in me and gentlemen it is an honour I most deeply respect, and one that I thank you for. The word unity became a popular catch-cry of this country some four years ago. There is not so much of that word heard here today. Yet I believe that unity and its parallels of ahebou and bung wantaim, are totally all important for this association to continue in its close association with the people and the government. It is to the people of this country who benefit from the professional skills from our members..... We are fortunate that the associated professional bodies are not so continually in contact as we are for we are continually in contact with the local people and particularly those in the villages.

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This year, gentlemen, I believe we must make closer contact with our government. Reports of the Commission of Enquiry into Land Matters will be the greatest single feature influencing future land matters in the country. This report is not one most like other reports that have been shelved. This one will be implemented and it will be implemented in a hurry; I think much sooner than we had imagined. Again I believe above all other matters, including those discussed here this week, we must contribute a submission to this Commission of Enquiry. For if we do not submit such a submission we will be politically non-existent. If there is no submission from this Association, we have no come-back by not being represented on the commission in the first place. The Minister for Lands and Environment, Mr. Albert Maori Kiki, has already requested greater participation by Papua New Guineans in the development of this Association. I am thankful your council has on it this year the most capable Papua New Guineans - one being the vice-president. This year Papua New Guineans within our Association will be encouraged to attend all council meetings as observers. It is my wish that your council prepare a submission about the affairs of the Association, its work, requirements for the future, problems and its role in the future of Papua New Guinea, and that this submission be presented to the Chief Minister and his cabinet to be read to them by your vice-president. It is gratifying to see two members of our Association on an advisory panel to the Association of Education. There is work to be done in improving the standard of Papua New Guinean surveyors upon registration and your council shall have recommendations placed before it in this field. Finally gentlemen, in this historic year of self-government, I, as your president, look forward to the work to be done and assure you of my interest in the viewpoint of each member of this Association. Thank you.

Mr. Garrett announced incoming Council.

|                 |   |                     |
|-----------------|---|---------------------|
| Francis Posanau | - | Vice-president      |
| Peter Jolley    | - | Secretary/Treasurer |

Other members of our council for the forthcoming year are Jeff Tierney, Alan Bale, Gil Hole, Maurice Whish-Wilson, Ivon Bryning and Brian Mennis.

AGENDA ITEM NO. 9 - ELECTION OF HONORARY AUDITOR

Mr. Garrett announced unavailability of Mr. Fielding.

Moved Mr. G. Sparkes-Carroll

Seconded Mr. B. Mennis

that appointment of an Honorary Auditor be made by Council.

Motion carried.



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AGENDA ITEM NO. 10. - PRESENTATION OF MEMBERSHIP CERTIFICATES AND ASSOCIATION PRIZES

Mr. Tierney: Presentation of Association Prizes normally made by Head of Surveying and this has been done this year.

Mr. Garrett then presented certificates to following members and Associates:

Noel Sharp  
Alan Bale  
Francis Posanau  
Graham Bateman  
Marian Cichoki  
Lionel Paisawa  
Gregory Thompson

David Forster  
Michael Lenz  
Paulus Breria  
Jerry Sipuman  
Kevin Donovan  
Geoffrey Brown  
Stephen Low

In Absentia

John Pike  
Colin Hard  
Dick Liew

John Liew  
Matthew Papai

AGENDA ITEM NO. 11 - DATE AND VENUE OF 10TH SURVEY CONGRESS, 1975

Moved Mr. B. Mennis  
Seconded Mr. T. Richards

that the 10th Survey Congress be held in Port Moresby.

Motion carried.

AGENDA ITEM NO. 12 - AMENDMENT OF BY-LAWS

Mr. Skehan read letter from O.S. Dahl, requesting the Meeting to amend the by-laws of the Association to allow the Associates to elect a member to Council. Mr. Dahl's motion to read:

"Council to consist of President, Vice-president, Secretary/treasurer, 6 Councillors elected by Corporate Members and 1 Councillor to be elected by Associates, to have full voting powers." The AGM to decide whether such councillor be elected from the ranks of Corporate Members, but if (selected) from ranks of Associates, then amendment to by-laws is necessary.

Moved Mr. Skehan  
Seconded Mr. Thompson

that such representative be elected by Associates.

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DISCUSSION ON AMENDMENT

Mr. Hole queried whether Amendment constitutional, in that currently Associates have no voting power.

Mr. Garrett read Parts 4, 4a, 5a, 6 & 7 and advised that the procedure should be that the motion instructs Council to approve the principle of the motion and for Council to set up the necessary action to change the Constitution. Then called for further debate on Mr. Mennis' amendment.

Mr. Richards supported the amendment.

AMENDMENT TO THE VOTE: Carried.

Motion now reads: That this Association elects an Associate member to Council.

To the Vote: Carried.

Mr. Hole expressed concern at effect on a quorum of increasing number of members moving to Australia.

Moved Mr. Hole  
Seconded Mr. Tierney

that one-third of the Corporate Membership normally resident in PNG with numbers adjusted downwards, personally present at a general meeting duly convened, shall constitute a quorum.

Motion carried. 31-0 (with Scrutineers)

Mr. B. Forster referred to by-law 4F

Moved Mr. B. Forster  
Seconded Mr. G. Hole

that the provisions of part (c) of by-law 4F be changed from Aerial Surveying to Photogrammetric Surveying.

Motion carried. 33-0 (with Scrutineers)

AGENDA ITEM NO. 13 - ANY OTHER BUSINESS

Moved Mr. B. Mennis  
Seconded Mr. A. Skehan

that a Constitutional Sub-Committee be established in Port Moresby to consider the following:

- (a) the Constitution generally;
- (b) the admission of Associates and their qualifications and representation on Council;



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- (c) the possibilities of either expansion of the existing Association to incorporate related Professions, or to assist in the establishment of a completely new Institution or Association.

This Sub-Committee shall consist of five members appointed by Council, at least three of whom shall be local members. The Sub-Committee shall submit a report to Council by the first of March, 1974, recommending what changes, if any, should be made to the Constitution. These (recommendations) shall be presented to Members with a Notice of Motion in accordance with those recommendations, and the matter be debated at the next Congress.

AMENDMENT:

Moved Mr. Tierney  
Seconded Mr. McLennan

that the motion be amended to read: that the Committee be established in Madang, rather than Port Moresby.

Discussion on Amendment

Messrs. Brown & Mennis spoke against the amendment.

To the Vote: Amendment to Motion - Lost.

Discussion on the Motion:

Mr. Richards expressed concern that the motion as it stood, delayed the the whole issue.

Mr. Hole advised that a Constitutional Sub-Committee was already in existence, and could be altered by addition of more Members. Agreed with Mr. Richards that the timing was not good enough.

Mr. B. Forster suggested that by enlarging By-law 4F, a Sub-Committee would not be required.

Mr. Garrett considered that Motion encompassed more than additional branches of Surveying.

Mr. Mennis regretted necessity of delay, but felt it necessary, to allow the PNG members to consider the future.

Mr. Richards felt that the Motion was too much of a "blanket motion" and that the meeting should be discussing:

- (a) admission of associated professions, &

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- (b) admissions of technicians.

MOTION TO THE VOTE: Lost.

Moved Mr. Hole  
Seconded Mr. Brown

- (a) that this Association not make alteration to entry qualification as they stand at present for Associate membership.
- (b) that to both preserve the status of Existing Corporate and Associate Members, this Association immediately sponsor and assist in the establishment of an Association of Survey Technicians, membership of which would enable persons to obtain such qualifications and experience to obtain membership of the A.S.P.N.G. as it is now constituted.
- (c) that the qualifications for entry to the grade of Corporate Membership be expanded to include those suitably professionally qualified in BRANCHES of the Profession, which are not at present allowed under the Constitution.

Mr. Hole spoke to the Motion.

Mr. Mennis considered that the Motion should have been put in two parts, since one dealt with formation of another association for technicians, whilst the other attempted to clarify requirements for Corporate Membership. Opposed separate association, while supporting the second part.

Mr. Posanau supported Mr. Hole.

Mr. B. Forster felt that by forming separate association and then allowing senior members of this to move into our own, would leave a very weak technician association.

Mr. Dent supported Mr. Mennis.

Mr. Sparkes-Carroll felt that Council could produce the guidelines, then the problem could be overcome.

Mr. Hole elaborated on current Associateship qualifications, and did not think that by spending up to 10 years in a "Junior" association then moving to "Senior" association, would weaken the junior body, as this body would have almost as senior members ready to carry out the business of the junior body.



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Mr. B. Forster suggested a Postal Ballot.

Mr. Richards pointed out that since 60% of people carrying out surveys will be technicians, then we were sponsoring the formation of a physically greater body in terms of numbers.

Mr. Carson supported the idea that technicians should come under the auspices of our Association.

Mr. Bryning asked about voting powers for third grade of membership if established.

AMENDMENT TO MOTION

Moved Mr. Dent  
Seconded Mr. Carson

that points (a) and (c) of Mr. Hole's Motion be put as one motion, and that point (b) of Mr. Hole's Motion be put as a separate motion.

Amendment carried.

AMENDED MOTION PART ONE

Points (a) and (c) to vote - Carried.

AMENDED MOTION PART TWO

Discussion:

Messrs. D. Forster & Thompson on technicalities of formation of such an Association.

Mr. Posanau. If agreed to, the setting up of junior body to be handled by Council.

Mr. Matheson suggested that discussion was now centred around the lowering of the status of the profession, rather than advancing it as laid down in Object 3 of the Objects of the Association.

Mr. B. Forster did not agree, in that we have virtually been directed by Government to foster the technicians.

AMENDED MOTION PART TWO

Point (b) of Mr. Hole's original motion to vote - Lost.

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Moved Mr. Richards  
Seconded Mr. Carson

that a new class of member be created to be known as Technical Associate, with admission qualifications to be decided by Council and that existing membership and qualifications remain unchanged.

AMENDMENT TO MOTION

Moved Mr. Larmer  
Seconded Mr. Dent

that in the motion by Mr. Richards the term "technical associate" be amended to read "technical affiliate"

Amendment carried.

MOTION AS AMENDED (SUBSTITUTE "AFFILIATE" FOR "ASSOCIATE") TO VOTE:

Carried 19-17.

Moved Mr. Dent  
Seconded Mr. Carson

that ACKNOWLEDGING our vital concern in all phases of Surveying and Mapping -

BEING aware of the Major contribution that modern scientific technology can provide in these fields -

IN considering the urgent problems in land matters facing this country -

THAT this Association strongly recommends that the Government establish a National Surveying and Mapping Authority, to be responsible to an appropriate Minister entrusted to develop, co-ordinate and implement plans for the surveying and mapping of the whole land and its resources.

Mr. Dent speaking to his Motion:

- (a) We need a combined authority to handle surveying and mapping problems of this country;
- (b) The matter should be taken by Council to the Committee of Enquiry into Land Matters.



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Mr. Carson  
Mr. Richards both spoke in support of the motion.

TO THE VOTE: Carried.

Moved Mr. Mennis  
Seconded Mr. Bryning

that Council be requested to investigate the provision of a film to show to high school students and the general public what the profession involves with the view to attracting new recruits to the profession.

Motion carried.

Moved Mr. B. Forster  
Seconded Mr. Tierney

that the Council of this Association requests this Director of the PNG University of Technology, to urgently set up a committee to look into all aspects of professional surveying education, with a view to extending the present Bachelor of Technology course to a full degree course.

Mr. Hole supported motion.

Mr. B. Forster explained difference between Bachelor of Technology and full Degree status.

MOTION TO VOTE: Carried.

Moved Mr. Bale  
Seconded Mr. Fitzhenry

that this Association makes a written recommendation to all departments in Papua New Guinea that first preference for all survey commissions, should be given to NG firms whose members, directors and shareholders are permanent PNG residents.

Mr. Fitzhenry spoke to Motion.

Mr. Jolley thought the motion too restrictive.

Mr. Posanau - Government should put these recommendations into effect immediately.

MOTION TO VOTE: Carried.

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Mr. Hole called for Postal Vote on Mr. Richards Motion under By-law 44.

The Chairman accepted the request.

Moved Mr. Richards  
Seconded Mr. Carson

that this General Meeting ask Council to put in train the necessary procedure to enable changes to the Constitution to be proposed and passed by a quorum at an Annual General meeting without prior notice as at present required.

Motion Lost.

Moved Mr. Fitzhenry  
Seconded Mr. D. Forster

that this Association makes a written recommendation to the Surveyor General that his Superintendent of mapping and all his staff offer a maximum of direct co-operation in the supply of data to practicing Surveyors, irrespective of whether the data requested is for Lands Dept. projects or outside clients.

Motion Lost.

DISCUSSION on Ninth Survey Congress in Bougainville

Mr. Larmer asked assurance from Bougainville delegates that there would be sufficient numbers to organise the Congress.

Mr. Smith advised that planning had commenced with Mr. McLennan as Congress Manager.

Mr. Brown opposed the venue (as a comment) on the grounds of cost.

Mr. McLennan advised that cheap accommodation had been arranged.

1973-74 SUB-COMMITTEES

Scale of Fees: Messrs. Garrett, Brown, Jolley, Bryning, Tierney, Posanau, Papai and Van As.

Education Sub-Committee: Messrs. Garrett, Skehan and Bryning.

Commission Inquiry into Land Matters Sub-Committee:

Messrs. Dent, Fitzhenry, Pochapon, Mennis and Garrett.

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Journal: Alan McCarthy and Tony Skehan to act as co-editors.

There being no further business the Chairman declared the Meeting closed at 3.30 p.m.

.....  
P.E. JOLLEY  
HON. SECRETARY.

HENRY DUNMAN EVE (1900-1938)

Submitted by Oz Dent, Photos by Brian Mennis.

Served in Federal Capital Commission as computer then surveyor, in Canberra, 1926-1930; in New Guinea, 1930-1938, as explorer and surveyor with Oil Search Limited; carried out many surveys in Sepik District and among his exploration expeditions the most important were the Oakley-Eve Patrol, 1932, and the Eve-Townsend Patrol, 1934.

Henry Eve's death in Wewak of blackwater fever occurred at the height of his career. He was so publicly esteemed that the people of Wewak and the Masonic Fraternity of which he was a member, erected this monument in his memory.

The monument is situated on the Wewak Point foreshore adjacent to the Wewak Point Hotel at the station where Henry Eve took astronomical observations to determine the true geographical position.

The monument thus became the Datum Point for all surveys emanating from Wewak.





## PROGRAMMABLE DESK-TOP CALCULATOR

By: A.E. Naughton

A "Compucorp 324 Scientist", manufactured by Datanamics, was inspected and appraised from the Cadastral Surveyor's viewpoint. A typical survey computation, the Bowditch Adjustment, was programmed to demonstrate the calculator's potential.

The Model 324 is powered by rechargeable built-in batteries, or a transformer. In an emergency four "D cell" dry batteries can operate the machine for about two hours.

The Model 324 is equipped to run two separate 80 step programs, and has ten stores. Programming is manual by keying in the model calculation steps.

All normal functions, arithmetic, trigonometric, etc. are available. Those function keys used in the demonstration program below are briefly described in their order of appearance in the program.

|               |                                                                                                                                                         |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Set D.P.      | designates number of decimals in display.                                                                                                               |
| STn +         | adds data (as displayed) to the contents of the Store, (0 to 9) as designated.                                                                          |
| STOP<br>START | causes the calculator to stop, to allow reading the display or inserting of data. When the program is running the same key re-activates the calculator. |
| → DEC         | converts degrees, minutes and seconds to degrees and decimals.                                                                                          |
| θ = r         | converts polar co-ordinates (bearings and distances) to the rectangular form (latitude and departure).                                                  |
| 2ND FUNC      | This key has numerous uses. In this context it causes a latitude to be replaced by a departure or a bearing by a distance.                              |
| CHG. SIGN     | converts a plus display to a minus.                                                                                                                     |
| x = y         | converts rectangular to polar co-ordinates.                                                                                                             |
| 1/x           | yields a reciprocal.                                                                                                                                    |
| RCLn x        | effectively multiplies the display by the contents of a designated store and displays the product. The store remains unaltered.                         |

## Programmable Desk-top Calculator

|     |                                                            |
|-----|------------------------------------------------------------|
| RCL | displays the contents of a designated store.               |
| EXP | means "multiplied by 10 to the power ..."                  |
|     | eg. " + 2EXP4 " means divide the displayed data by 20,000. |

### Bowditch Adjustment Program

A hypothetical nine course traverse was devised to give a perimeter of about 4 Km with a misclosure in both latitude and departure of about 0.5 m (1:5000) to provide a model case.

The latitude and departure of each line and of the misclosure were determined using the Model 324 as a calculator only. The results were tabulated in the conventional manner.

This computation was then programmed and tested against the model case. Several program errors were located and rectified. Such errors are simply located by using the Model 324 as a calculator only, but rigidly following the program steps and inspecting the display as each step is carried out.

Adjustment factors were then calculated ie. closing latitude or departure + perimeter. It would have been a straight forward task to adjust the tabulated latitudes and departures in the original (manual) computation. However, the objective of the program was to display adjusted co-ordinates rather than adjusted latitudes and departures.

The original closure was recalculated, incorporating the Bowditch Correction in the determination of each latitude and departure; the adjusted co-ordinates were tabulated.

This calculation was then programmed using Program One as a guide. The resulting program:

- (i) determined each unadjusted latitude and departure.
- (ii) calculated the individual Bowditch Correction.
- (iii) added the Bowditch correction to each latitude and departure.
- (iv) totalled the individual adjusted latitudes and departures.
- (v) displayed the adjusted co-ordinates at the end of each course (line).



### Programmable Desk-top Calculator

The program was tested and program errors were located and rectified. It was now possible to use Program One to test the closure and, by re-entering the data in Program Two, to adjust and display the adjusted co-ordinates, provided a short non-programmed calculation was made in between.

Had this non-programmed determination of correction factors and precision been incorporated in Program One (as appears logical) unnecessary delays would occur in entering the various bearings and distances; with a little care no blunders need be made in this calculation and the final adjustment is self-checking.

Consideration was then given to the enclosed area. Multiplying each co-ordinate North by the previous Co-ordinate East yields an area assumed positive and multiplying each Co-ordinate East by the previous co-ordinate North yields an area of opposite sign.

The program, to be most efficient, needed two stores to hold the current Co-ordinates North or East and two stores to hold the previous Co-ordinates North or East. Multiplying those at the appropriate time and adding their products into another store would supply an accumulating area in square metres. Typically, if Store 1 contained the Co-ordinates North at the end of each traverse line, it was a straightforward matter to "RCLn 1 STn 3" which entered that Co-ordinate North into Store 3 as well.

The program was amended to include the area computation, was tested and errors rectified. Various other minor improvements were now attempted:

- (i) a signal 1.0000 was programmed in to indicate that a bearing was now required,
- (ii) a signal 2.0000 indicated that a distance was required,
- (iii) the area was converted to hectares within the second program,
- (iv) to avoid the frustration of "losing one's place" near the end of a long closure a course (line) number was programmed in. Upon the signal 1.0000, the request "RCLn 0" indicates the number of the next course to enter, and the bearing is immediately entered.

At this point an interesting program error was discovered. Earlier in the program the calculator was asked to multiply the contents of Store 2 by Store 3. Some twelve steps later it was asked to calculate "2EXP4 =" ie.  $2 \times 10^4 =$  (to convert metre to hectare). The Model 324 assumed that the content of Store 2 was a multiplying constant and in fact, calculated  $RCL 2 \times 2 \times 10^4$ . The identification of this program error took some time; and an alternative instruction was given using brackets (2EXP4) but markedly increased the total number of steps. The program was then carefully inspected, re-arranging the order of some steps condensed the program to a reasonable number of steps. This re-arrangement of steps is a stimulating mental exercise and greatly improves one's knowledge of the Model 324.

### Programmable Desk-top Calculator

#### Conclusion

- (i) It is annoying to have long delays when running a program - hence the short manual calculation between the programs.
- (ii) If an area only is required the display of adjusted co-ordinates is avoided by omitting steps 56 and 61 in Program Two.
- (iii) The program is ideal for computing between control points of known co-ordinates. The area must of course be ignored in this case.
- (iv) The program can start and finish on any co-ordinates.
- (v) If a change in bearing datum is required, there is sufficient space in the program for this to be done automatically between Steps 7 and 8.
- (vi) Sea level correction and scale factor (U.T.M.) can be programmed in between steps 2 and 10. The resulting co-ordinates and areas would be corrected.

A programmable desk top calculator of this capacity is a significant aid to the surveyor but programs should be thoroughly tested and verified before being adopted. Only those calculations in regular use should be programmed as an 80 step program can take considerable time to prepare and verify.





COMPU CORP 32KG PROGRAM No: 4 PROGRAMMER: 96/1 Date: 12/73

PROGRAM OF: BOWDITCH ADJUSTMENT PROG 1

PRE-PROGRAM NOTES: PROGRAM 2 FOLLOWS

BEFORE LOADING CLEAR STN 0, 1, 2, 3, 6 SET D.P. 4

| PROGRAM DETAILS |        |    |    | MEMORY |                          |
|-----------------|--------|----|----|--------|--------------------------|
| 01 RESET/LOAD   | 21 2   | 41 | 61 | 1      | TOTAL LATITUDE           |
| 02 1            | 22 RUN | 42 | 62 | 2      | TOTAL DEPARTURE          |
| 03 STN          | 23     | 43 | 63 | 3      | TOTAL PERIMETER          |
| 04 +            | 24     | 44 | 64 | 4      | CLOSING LATITUDE         |
| 05 0            | 25     | 45 | 65 | 5      | CLOSING DEPARTURE        |
| 06 STOP         | 26     | 46 | 66 | 6      |                          |
| 07 →DEC         | 27     | 47 | 67 | 7      |                          |
| 08 0=R          | 28     | 48 | 68 | 8      | CORRECTION TO LATITUDE   |
| 09 2            | 29     | 49 | 69 | 9      | CORRECTION TO DEPARTURE  |
| 10 STOP         | 30     | 50 | 70 | 0      | COURSE (LINE) NUMBER     |
| 11 STN          | 31     | 51 | 71 |        |                          |
| 12 +            | 32     | 52 | 72 |        | (* CONT.) READ PRECISION |
| 13 3            | 33     | 53 | 73 |        | (1:?,000)                |
| 14 =            | 34     | 54 | 74 |        | GO TO PROG. 2            |
| 15 STN          | 35     | 55 | 75 |        |                          |
| 16 +            | 36     | 56 | 76 |        |                          |
| 17 1            | 37     | 57 | 77 |        |                          |
| 18 2ND FUNC     | 38     | 58 | 78 |        |                          |
| 19 STN          | 39     | 59 | 79 |        |                          |
| 20 +            | 40     | 60 | 80 |        |                          |

OPERATING INSTRUCTIONS: START, READ DISPLAY 1.0000 ENTER BEARING

START, READ DISPLAY 2.0000 ENTER DISTANCE START

WHEN ALL COURSES HAVE BEEN ENTERED:

RCLW 1 CHANGE SIGN STN 4 RCLW ÷ 3 STN 8

RCLW 2 CHANGE SIGN STN 5 RCLW ÷ 3 STN 9

RCLW 4 X 0Y RCLW 5 = 2ND FUNC 1/X RCLW X 3 CONT ABOVE \*

COMPU CORP 32KG PROGRAM No: 4 PROGRAMMER: Date: / /

PROGRAM OF: BOWDITCH ADJUSTMENT PROG 2

PRE-PROGRAM NOTES: FOLLOWS PROGRAM 1

DO NOT CLEAR STN 8 OR 9

| PROGRAM DETAILS |             |         |         | MEMORY |               |
|-----------------|-------------|---------|---------|--------|---------------|
| 01 RESET/LOAD   | 21 STN      | 41 RCLW | 61 STOP | 1      | Co-ORD NORTH  |
| 02 1            | 22 +        | 42 4    | 62 STN  | 2      | EAST          |
| 03 STN          | 23 1        | 43 RCLW | 63 5    | 3      |               |
| 04 +            | 24 2ND FUNC | 44 X    | 64 RUN  | 4      |               |
| 05 0            | 25 +        | 45 2    | 65      | 5      |               |
| 06 STOP         | 26 RCL      | 46 ÷    | 66      | 6      |               |
| 07 →DEC         | 27 3        | 47 2    | 67      | 7      |               |
| 08 0=R          | 28 RCL      | 48 EXP  | 68      | 8      | As FOR PROG 1 |
| 09 2            | 29 X        | 49 4    | 69      | 9      | " " "         |
| 10 STOP         | 30 9        | 50 =    | 70      | 0      | COURSE NUMBER |
| 11 STN          | 31 =        | 51 STN  | 71      |        |               |
| 12 3            | 32 STN      | 52 +    | 72      |        |               |
| 13 =            | 33 +        | 53 6    | 73      |        |               |
| 14 +            | 34 2        | 54 RCLW | 74      |        |               |
| 15 RCLW         | 35 RCLW     | 55 1    | 75      |        |               |
| 16 3            | 36 5        | 56 STOP | 76      |        |               |
| 17 RCLW         | 37 RCLW     | 57 STN  | 77      |        |               |
| 18 X            | 38 X        | 58 4    | 78      |        |               |
| 19 8            | 39 1        | 59 RCLW | 79      |        |               |
| 20 =            | 40 -        | 60 2    | 80      |        |               |

OPERATING INSTRUCTIONS: CLEAR STN 0, 3, 5, 6, Co-ORD NORTH  
OF COMMENCEMENT STN 1, EAST STN 2 START

DISPLAY 1.0000 ENTER BEARING START 2.0000 DISTANCE

START, READ "NORTH", START READ "EAST" START

(LAST Co-ORD NORTH AND EAST SHOULD CHECK OK.)

To READ "AREA" RCLW 5



By: K.J. Aschhoff

An engineering survey of the Finschhafen Aerodrome was recently carried out by the students of the Surveying Certificate course of the Papua New Guinea University of Technology.

The aim of this exercise was to give students the opportunity to apply in practice some of the theory they have been taught and to test their ability to produce results in the field under normal working conditions as can be found in this country.

Fourteen first year students were used on the project to give them an introduction to some of the duties they may be called upon to perform after the completion of their course.

The survey party consisting of one instructor, one storeman, one cook, three third year and fourteen first year students, sailed from Lae to Finschhafen on the Administration trawler M.V. MOROBE, arriving at their destination the following morning. The voyage was pleasant and uneventful and was particularly enjoyed by those students from the Highlands regions who had never been to sea before.

Upon arrival at the Administration wharf at Dregerhafen the survey party was met by the Finschhafen Public Works Department representative. All equipment and personnel were moved from the M.V. MOROBE to the survey camp site by Public Works Department transport.

#### Camping

The site chosen for the survey camp was within five minutes walking distance of the north-west corner of the aerodrome and was situated on the north bank of a prominent creek. Public Works Department staff at Finschhafen had very ably prepared the area of the camp and a solid and safe footbridge had been constructed across the creek.

The camp itself consisted of three large and one small tent fly, sufficient to accommodate all students, a kitchen built out of bush materials situated west of the tentlines, and a latrine also constructed out of native materials placed east of the accommodation tents. In the nearby creek two deep water holes were still present, left over from the second world war, which gave the members of the survey party ample opportunity to swim.

#### Survey

From the Survey Brief it was quite obvious that a great deal of actual field work had to be carried out in the available time, which was one week. It was therefore decided to form three working groups, each one consisting of a third year student as party leader and several first year students acting as chainmen and assistants. Each group was then given a specific task to perform. These were:

Group I, under the leadership of Bernard Dreka, a third year student sponsored by Public Works Department, was to carry out an identification of some of the original cadastral boundary lines by reading several angles and measuring a number of distances on the western and northern part of the airfield. For distance measuring this party was to use the University's distomat. Upon completion of this work the group was to locate all existing improvements on Department of Civil Aviation land using a plane table.

Group II, under the leadership of Gabriel Semoso, a third year student sponsored by Bougainville Copper, was given the task of taking cross-levels on the airfield.

Group III, under the leadership of Wari Agi, a third year student sponsored by Messrs. Arman and Larmer, was to relocate the true centre line of the airfield and mark an offset centre line.

#### Fieldwork

Survey work now commenced in earnest. By midday of the first day Group I had already completed most of their identification measurements. The permanent marks placed previously at the northern and southern end of the aerodrome had been located and levels had been taken. A discrepancy of 0.10 of a foot was found between the two points using the heights stated on the Department of Civil Aviation plans. This was considered to be insignificant and work now started as per instructions.

Group I finished their identification measurements and commenced the plane table survey starting at the northern boundary of the airfield and using the line between iron spike "A" and OCP 36 as datum.

Group II began taking cross section levels at chainages of 25 m intervals beginning at Permanent Survey Mark 1 and at distances of 10, 20, 30, 40, 50 and 60 metres left and right of the centre line and at obvious changes of grade.

Group III started also at Permanent Survey Mark 1, using a long stake plumbed accurately over permanent survey mark 11 as their sight for datum and establishing a point at right angles to the true centre line at a distance of 30m. This point became station chainage 00.00 of the off-set centre line. This off-set centre line was marked accurately every 25 metres with a six inch bridge spike, and indicator-finders were placed approximately one foot east of each spike. Group II used this off-set centre line for their levelling by having one assistant standing over a spike holding an optical square and lining up three stave men along a 100m steel band on which black marking tape had been placed at the distances required.

The iron spike at the northern boundary of the airfield was found by extending the true centre line in a northerly direction and intersecting it with the bearing of line 36 to 35 as shown on the survey plan. This spike being set in a block of concrete was located about 3 inches below the grassed surface.



The true centre line was defined by placing a front-end loader, with a 3 inch x 6 foot pipe painted red and white and firmly secured to the centre tooth of the bucket accurately plumbed over permanent survey mark 1, and a Wild T2 theodolite set up over permanent survey mark 11. Four intermediate stations were then established and marked along the true centre line of the air strip to provide check points whilst marking the true centre line and to guarantee maximum accuracy.

A daily check was made on all work and results were collated at the end of each day.

### Results

The work carried out by the students proved to be of an exceptionally high standard and the volume of work produced is quite remarkable. This was achieved by commencing work at 6 am and finishing at 6 pm from Tuesday to Friday. Although, as mentioned earlier, heavy rain was experienced on two days, the aforementioned timings were strictly adhered to and taught the students a valuable lesson - namely, to carry out field work in this country when weather permits it and not to try to work to prescribed office hours.



By: J. Kronenburg

(An edited version of a thesis presented to the Council of the Association of Surveyors of P.N.G., for the purpose of being upgraded from an Associate to a Corporate Member.)

### Chapters

1. Initial Searching
2. Location of Survey.
3. Scope of Survey.
4. A look at Road Development.
5. Standard Survey Instructions - Conversion to Metric Units.
6. Distribution of P.W.D. Survey Expenditure.
7. Distribution of Expenditure on Rural Development Road Surveys.
8. Comments - Rural Development Road Surveys.
9. Cost Analysis of Transport and Accommodation Charges in Surveys.
10. Cost Analysis of Government Surveyor Hourly Rates.
11. Conclusion.

#### 1. Initial Searching, Collecting of Available Data

When a request for a Survey has been received by the Survey Section, the first chore is to search for all the available information. Such data may be held by the Department of Public Works in the form of maps or photography, or as cadastral information filed at the Department of Lands. When all the relevant plans have been obtained, only then can a brief be issued to a Consultant Surveyor.

The rather mundane task of collecting all the relevant data for the issuing of an instruction is an additional cost to the survey. It is a hidden cost. It normally takes about two days. If this searching time is calculated on the Government hourly rate it will vary between \$158 for an Engineering Surveyor to \$200 for a fully qualified Surveyor. This cost is a considerable percentage for a small survey. The only way to minimise this cost, is to instruct the various client Departments or Authorities to furnish more detailed information regarding the project, when a request is made to provide an estimate involving survey work.

#### 2. Location of Survey

The actual locality of the required Survey does, to a certain extent, determine the choice of the Consultant to be commissioned.

However when a surveyor is briefed for an Engineering survey, Engineers and Architects are usually in a hurry to get the information for their various reasons. The Department could reduce expenditure if a Consultant's Work Programme could be known at the time when a Surveyor is to be commissioned. This of course comes back to liaison and co-operation.



It is sometimes possible to anticipate survey requests from the various design Sections by studying the Department's Works Programme. In such cases, it could happen that two or more surveys in the same area can be grouped together, and one Surveyor be briefed to carry out several jobs. Unfortunately work can be taken off the programme at a moment's notice and replaced later, or after a survey has been carried out the project may be temporarily cancelled, and then the survey might need repeating because the marks have disappeared.

Engineering surveys over a certain size require a "Notice of Intention" to be sent to the Department of Lands, Surveys and Mines, who in turn may direct that certain survey work be carried out at the same time. Again I point out that if a Consultant's programme is known for six weeks in advance then the Government Department's planning is facilitated.

### 3. Scope of Survey

Most Engineering surveys are carried out in accordance with the Department of Public Works "Standard Survey Instructions". It has been frequently found that if the Surveyor is expected to use his discretion as to the obtaining of sufficient data for design, that all the requirements will not be fulfilled. Job instructions must therefore be "spelled" out to obtain a satisfactory result.

It becomes obvious that specialisation in the various branches of Surveying produces consultants who give best satisfaction to their clients. An experienced Engineering Surveyor, whether professional or sub-professional, seems to have a better concept of Engineering problems, which could arise during the design.

It appears that in a developing country like Papua New Guinea, more money is required for Engineering Surveys than in boundary delineation. This is, and has been, the case in other countries such as Indonesia and Africa. At present we suffer from not having enough experienced Engineering Surveyors, and while they are being trained at the University in Lae, there will be a time lag before they have the necessary experience, and "Time" is a precious commodity.

### 4. A Look at Road Development

Government policy seems to be to attempt to commence as many separate projects as possible each year, by not committing very large sums to any one project. The amounts may be between \$200,000 and \$300,000.

Construction will not be by large contracts to build an asset in its entirety, but rather by plant hire contracts similar to that adopted for the Gogol - Urigiwa project. The trend is also to lower the standards of the roads, thus resulting in a lower survey cost component, but perhaps more survey projects. For this reason the components of survey costs such as travel and accommodation may be higher.

Road locations must be carefully carried out with a view to easy upgrading of the road at a later date.

With more and more mapping being carried out the original investigation will be facilitated with the use of aerial photographs and intermediate scale topographic maps.

In Africa, the Engineers have developed programmes for roads which are termed as "Stage Development". Walking tracks are upgraded for motor vehicles in stages until eventually a bituminous surface is required.

With road surveys there is the fact that after a project was completed little further use was made of the knowledge acquired from the survey. If the design work is carried out on maps produced by aerial photogrammetry the previous cost of "wasted knowledge" is offset because of the far greater beneficial and economic use of the maps.

A greater co-operation of the various professions such as Photogrammetry, Geology, Engineering, Forestry and Surveying is needed in Papua New Guinea, so that greater benefits can be obtained from the one major expenditure. Perhaps some very elementary knowledge of Engineering Geology, Soil Mechanics and Forestry could be incorporated in the Surveying Technician Syllabus at the University of Technology, as such knowledge combined with experience can pay dividends.

### 5. Standard Survey Instruction: Conversion to Metric Units

With the introduction of metrication to the Department of Public Works life for the Survey Section became a lot easier. Previously when topographic detail was required, and the information was obtained by photogrammetric methods, a metric plan would result. It was quite an onerous task to produce a plan which enabled imperial measurements to be easily scaled.

With the changeover in the Survey Standard Instructions it was found possible to reduce the Standards of some works, for example, cross sections every 100 ft became cross sections every 50 metres in many cases, and this has resulted in a direct decrease in survey costs.

### 6. Distribution of Survey Expenditure in Papua New Guinea

With regard to this section, and for more detailed explanation, I refer you to a paper by the Principal Surveyor, Mr. G.R. Hole, titled "The Development of Surveying Activities within the Department of Public Works", the Sixth Survey Congress, Rabaul, 1971.

The table shows Engineering Survey Expenditure (major instructions) in Papua New Guinea for the years 1969 - 1973. Various Districts have been grouped together as follows.



Papua and Morobe - Morobe, Northern, Milne Bay, Central, Gulf and Western District.

North Coast - East Sepik, West Sepik, Madang and Manus Island.

Highlands - Eastern Highlands, Western Highlands, Southern Highlands and Chimbu.

New Guinea Islands - Bougainville, New Britain and New Ireland.

The expenditure includes:

Rural Development Road Surveys,  
Sub-divisional Road Surveys,  
Urban Road Surveys,  
Water Supply and Sewerage Surveys,  
Construction Pegging,  
Control Surveys, and  
Aerial Photography.

The table does not show expenditure on Minor Surveys such as Architectural Site Surveys and minor Photogrammetric Services which we limited to \$1000 per instruction or less.

| 1969-1973                                  | Papua/<br>Morobe | North<br>Coast | Highlands | Islands   | P.N.G.    |
|--------------------------------------------|------------------|----------------|-----------|-----------|-----------|
| Expenditure for<br>Period                  | \$122,706        | \$132,303      | \$385,957 | \$150,662 | \$791,628 |
| % of total                                 | 15.50%           | 16.71%         | 48.75%    | 19.04%    | 100%      |
| Total expense<br>per head of<br>population | 21.6¢            | 26.2¢          | 40.2¢     | 54.0¢     |           |

#### 7. Distribution of Expenditure - Rural Development Road Surveys

The table shows the actual survey expenditure on Rural Development Roads during the period July 1, 1969 to December 31, 1972.

When analysing the table we notice that the highest expenditure was in the three Highlands Districts and the Chimbu area.

| District       | Total<br>Expenditure | Miles | Average<br>Cost/mile | Cost/head |
|----------------|----------------------|-------|----------------------|-----------|
| Western        | \$11,261             | 44    | \$256                | 17.0¢     |
| Gulf           | \$ 3,000             | 10    | \$300                | 4.3¢      |
| Milne Bay      | \$ 7,519             | 72    | \$104                | 7.0¢      |
| Northern       | \$18,995             | 43    | \$441                | 31.0¢     |
| S. Highlands   | \$20,536             | 57    | \$360                | 10.0¢     |
| W. Highlands   | \$40,397             | 150   | \$269                | 12.1¢     |
| Chimbu         | \$35,875             | 150   | \$239                | 19.2¢     |
| E. Highlands   | \$39,863             | 172   | \$232                | 17.0¢     |
| Morobe         | \$21,058             | 73    | \$288                | 8.7¢      |
| Madang         | \$19,608             | 105   | \$186                | 11.0¢     |
| E. Sepik       | \$ 4,690             | 34    | \$138                | 2.3¢      |
| W. Sepik       | \$ 5,287             | 15    | \$352                | 5.3¢      |
| Manus          | \$ 1,109             | 3     | \$370                | 4.9¢      |
| New Ireland    | \$ 3,425             | 18    | \$190                | 7.0¢      |
| E. New Britain | \$ 3,265             | 15    | \$218                | 3.3¢      |
| Bougainville   | \$11,530             | 38    | \$303                | 15.1¢     |

#### 8. Comments - Rural Development Road Surveys

In the case of the equipment necessary to carry out a Rural Development Road Survey, the cost is between \$100 and \$250, which consists mainly of a clinometer and a compass. This is far less than the normal outlay for a set of Engineering survey equipment. It might appear that it is more profitably to specialise in such work, and this is probably true, although the expertise needed for such work is not minimal and the hardships are many.

Perhaps we can ask ourselves, are we justified to charge the full hourly rates, in view of less capital outlay for equipment to execute the survey, and, do we have the skill and experience? The New Zealand Scale of Fees suggests that hourly rates should be charged to the client according to the skill and experience of the surveyor undertaking the work. If the work calls for a special degree of skill or responsibility, the rate may exceed the suggested norm. Perhaps the Scale of Fees Sub-Committee may wish to examine these points.



The Department of Public Works specifies that payment be made to labourers only if, by doing so, delays will be avoided. The Department of District Administration disagrees with this policy. I think it is the responsibility of the Department of Public Works to contact the Department of District Administration to see if this matter can be sorted out.

9. Cost Analysis of Transport and Accommodation Charges in Surveys

These costs include air fares, boat travel, car travel, taxis, camping, hotel, motel and hostel expenses.

| Area               | % Cost of Total, for Accommodation and Travel |
|--------------------|-----------------------------------------------|
| Highlands          | 14.69%                                        |
| New Guinea Islands | 12.94%                                        |
| North Coast        | 15.58%                                        |
| Papua - Morobe     | 21.01%                                        |

It would appear that the availability of consultant surveyors close to work areas in the Papua/Morobe area is less than other parts of Papua New Guinea.

This transport and accommodation component of the total survey bill may increase as more expatriate surveyors leave, until they can be adequately replaced by the products of the University of Technology in Lae. It is one area of the survey bill which can be considerably reduced when there are sufficient surveyors in the various areas.

It is the Department's aim to have one or more Surveyors or Technicians, as the case may be, allocated to each Public Works Department's District. At present this situation is difficult to achieve because of the impossibility of attracting staff.

Government surveyors are also loathe to camp out because of the small allowance paid for this hardship. At present the allowance is \$4.20 for a married officer and \$3.00 for a single man. If the government raised this amount more officers would be prepared to camp and there would be further savings in survey costs.

Both consultants and Government departments should investigate and implement a method of saving costs for motor vehicles. The history of other forms of transport such as pack horses, mules and so on makes interesting reading, and ideas for the contrived use of such modes of transport are frequently aired by members of the House of Assembly.

It may well be that at some time in the future the use of pack animals in Papua New Guinea could become widespread, and they may have to be used by survey parties operating in remote areas, to relate the cost of surveys to the economy of an independent Papua New Guinea.

10. A Cost Analysis of Hourly Rates

The Consultant

About two years ago the Consultant Surveyor working on hourly rates would expect to divide his gross income into three parts,  $\frac{1}{3}$  salary,  $\frac{1}{3}$  overhead, and  $\frac{1}{3}$  profit. With the large increase in overheads and salaries this is no longer the case.

At present the hourly rate for a Corporate member of the Association is \$16.20 minimum, while for a Survey Technician and non-member of the Association it is \$12.00 minimum.

The various Divisions of the Institutions of Australia have based their hourly rates on the formula:-

$$\text{Annual Salary} \times \frac{2.1}{1350}$$

The figure 2.1 is slightly variable between the Divisions, 1350 is 180 days at  $7\frac{1}{2}$  hours per day.

The present low figure for the annual salary of the Qualified Surveyor and Survey Technician is \$12,000 and \$9,000 respectively. In the hourly rate formula quoted above these salaries give hourly rates of \$18.67 and \$14.00.

It would appear that the present hourly rates are due for revision.

The Government Surveyor, Class II

|                            |                    |
|----------------------------|--------------------|
| Salary                     | \$12,686.00        |
| Marriage Allowance         | 360.00             |
| Child Allowance            | 182.00             |
| Leave fares                | 520.00             |
| Superannuation             | 500.00             |
| Support factor             | 291.00             |
| Recruitment                | 1,183.00           |
| Survey Equipment factor    | 400.00             |
| House rent \$35 @ 52 weeks | 1,820.00           |
| Office rent                | 500.00             |
| <b>Total Cost</b>          | <b>\$18,442.00</b> |
| <b>Cost/hour</b>           | <b>\$9.65</b>      |



Furthermore the following loading time factors should be taken into account.

Sick leave, 1 week, 36.75 hours  
Recreation leave,  $6\frac{1}{2}$  weeks, 238.87 hours  
Public holidays, 10 days, 73.50 hours  
Special leave, 3 days, 21.15 hours  
Unproductive time, 7.13 weeks, 262.03 hours.

Hence the actual productive time is 34.8 weeks, giving a cost/hour = \$14.42.

The Senior Technical Officer Grade I

The only cost component which will alter, is the salary, which is \$8719.

Hence for actual productive time the cost/hour calculates at \$11.32.

In both cases the difference between the present consultant and government hourly rate give a percentage profit margin of 10.99% and 5.67% respectively to the consultant. It is uneconomical to run a business on such a small profit margin, and from this point of view the present government hourly rates may be considered as indirectly higher than that of the consultants.

The Government Surveyor and Survey Technician are very much needed to advise their departments on survey procedures, provide estimates and commission consultant surveyors. They are also needed to examine the work by the consultant, and ensure that the Government is getting a fair deal from the private sector.

11. Conclusion

In this paper I have endeavoured to present various methods, that could assist in lowering the cost of executing surveys, without lowering the actual standard.

In examining the various aspects described, one fact emerges, that there is a need for more liaison between the various professions associated with surveying. Also more co-operation and understanding must be established between surveyor and client.

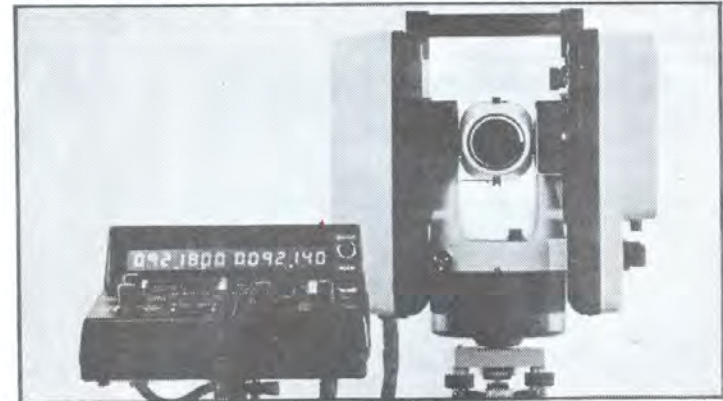
To lower the present survey standard, would be a retrogress step. With the present sophisticated survey equipment and techniques available, it is possible to achieve an equal, if not a greater accuracy, to that provided in the past at a reduced cost.

As the largest professional association in this emerging nation, it is our responsibility to assist and advise this government, by showing them that a properly executed survey becomes a form of indirect investment for the future.

November 1973.

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The AGA model '700' can be operated in 3 ways:

1. As a 1" Theodolite, with a display of horizontal and vertical angles, or
  2. With a continuous display of vertical angle and slope distance, or
  3. With a continuous display of bearing and automatically reduced horizontal distance.
- any of the three displays obtainable with the flick of a switch.

**Field tests prove,** compared with a conventional theodolite with attached distance meter:

4. Any setting out work is completed in  $\frac{1}{3}$  the time.
5. Any traversing is completed in just over  $\frac{1}{2}$  the time.
6. Any detail work is completed in  $\frac{1}{12}$  the time.

**Other features are:**

7. A range of 5 km.
8. An accuracy of  $\pm 5\text{mm} + 1\text{ppm}$ .
9. Measurements unaffected by temporary beam interruption.
10. Measuring time 10 — 15 seconds.
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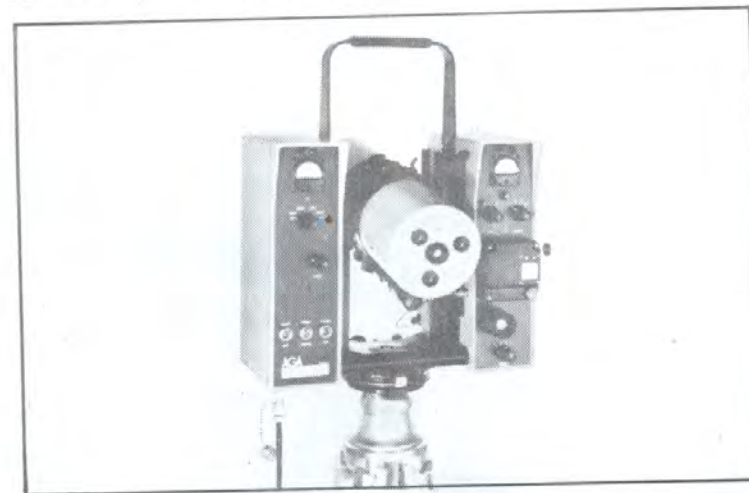
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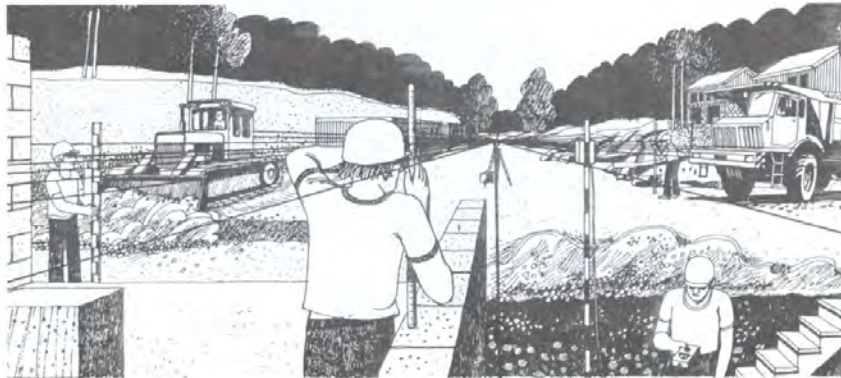
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### ADVANTAGES

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10. Office of Programming and Co-Ordination, Bureau of Census and Statistics.
11. Department of Transport.
12. Department of Public Works.

Editor's Note: Mr. Kronenburg's original thesis to Council was a well written and commendable 36 page document.



## Ode to a Rural Development Road Survey

By: Mark Olidoit

Out the back of Wau, where the mountains grow tall and the country is a virgin - it's places like these that we get those Engineering Commissions.

A vehicular road they say, it's been tried five times before but stay inside the Standards.

The last kiap was there for fifteen weeks (his road ceased at a Warakalap), don't you spend more than three.

Damned are those who engage in such work, for they will be sucked by leeches, fall into patches of salad and down ravines, be rained on continuously with icicles at 7000 feet, sleep on the ground, walk the length of the road fifteen times, be abused by the owners of gardens, be bitten by fleas and moccas, be kicked by a cassawary and catch malaria.

So here is a plea to those who work on the Scale of Fees, let there be a special section for the R.D.R. - at double the rate.

(For those who have never fallen into a patch of salad, the pidgin word for a type of stinging leaf, watch out. The leaves are not dissimilar in appearance to very large mint leaves, and they grow in the same fashion. The sensation is like fifty bee stings all at once.)



## PERSONALITY OF THE PROFESSION

Michael David Kellock



Mike is the Head of the Surveying Department at the Papua New Guinea University of Technology. He has just returned from study leave taken at the University of Queensland, where he undertook the degree of Master of Surveying, specialising in photogrammetry. See above.

During the last eleven years Mike has had a notable career in Surveying in P.N.G.

After graduating from Melbourne University in 1961 and being licensed in February 1963, he took up appointment with the P.N.G. Department of Lands, Surveys and Mines as a Grade I surveyor in March 1963.

During the period 1963-64 he was responsible for a wide variety of Survey Instructions in various parts of the country. In the late part of 1973 he was seconded to the Commonwealth Division of National Mapping to assist in the establishment of the First Order geodetic and astronomical control network of Papua New Guinea and, following completion of this, was involved in much of the planning and the initial execution of the extension of this control to Second and Third Order Networks for cadastral and photogrammetric purposes.

Two vivid recollections of this come to mind.

"One of my most hair-raising experiences was an early morning trip by Catalina seaplane to Baimuru. It was New Year's Day and we departed at 0700 hrs, having come straight from the previous eve's celebrations. From there I took a helicopter to the top of an 800ft pinnacle of rock 80 miles up the Purari, where I spent the following week recovering and doing a little work. Before the helicopter could come back it crashed on Mount Otto, so it was a terrifying trip by canoe to get out.

The second memorable experience was being clouded in at 12,200 ft on Mount Piora, 30 miles south of Kainantu, for six weeks with Ian Johnson."



Mike was a trail blazer for the establishment of the Surveying course at the P.N.G. University of Technology. The course began at the Department of Lands, Surveys and Mines in 1966 and was transferred to the University in 1967. The first graduates completed the four years course in 1969. The Surveying Department has now expanded and includes Cartography, Valuation and Survey Technician courses.

Professional activities include the following:

Councillor of the Association from 1965 to 1967, Secretary from 1967 to 1970 during which time he was also Congress Manager on two occasions and foundation member of the Commonwealth Board of Surveying Education.

Publications:

1. The Training of Photogrammetrists and Photogrammetric Technicians in Papua New Guinea - Paper delivered to the Photogrammetric Society of Papua New Guinea in August, 1968.
2. The Future of the Surveying Profession in Papua New Guinea - Proceedings of the Fourth Survey Congress of the Association of Surveyors of Papua New Guinea, 1969.
3. Third Annual Report of the Survey Coordination Committee of the Association of Surveyors of Papua New Guinea - Recommendations for the Implementation of Survey Coordination in Papua New Guinea. A.S.P.N.G. Publication, May 1972.
4. Surveying Education in Papua New Guinea - Proceedings of the Seventh Survey Congress of the Association of Surveyors of Papua New Guinea, 1972.
5. The Quest for the Millimetre - Aspects of Metric Conversion. The Australian Surveyor, Vol. 25, No. 1, March, 1973.

Mike spends his spare time with wife Fay and five children, growing orchids and playing loud music. His plans for the future are to do more of the same.

Report by A.J. McCarthy

The Board of Surveying Studies held its Second Meeting in Port Moresby on Wednesday April 17, 1974.

The Board was originally established in 1973 for the purpose of periodically reviewing the contents of the courses of Surveying, Cartography and Survey Technician, recommending changes in contents and methods where necessary, and advising the University of changing demands within the profession.

Membership of the Board of Studies is as follows:

The Surveyor-General, or his nominee.

Head of the Department of Surveying at the University of Technology.

Two representatives of the Association of Surveyors of P.N.G.

Two representatives from the University.

Chief Draftsman - Department of Lands, Surveys and Mines.

Chief Draftsman - Department of Forests.

Principal Surveyor - Department of Public Works.

Chief Photogrammetrist - Central Mapping Bureau, Department of Lands, Surveys and Mines.

Superintendent of the Central Mapping Bureau, Department of Lands, Surveys and Mines.

The relevant Senior Lecturer or Head of Course to attend as required.

Specific matters to arise from the Second Meeting may be briefly listed.

1. The Chairman is to report to the next meeting on the effects of the Commission of Enquiry into Land Matters.
2. The Head of Department of Surveying is to investigate the present, and probable future, manpower requirements for Surveying and Cartography.
3. Specialised training requirements for the Central Mapping Bureau might be more economically obtained by attachment to the Division of National Mapping, Canberra or similar overseas organisation.
4. The final year surveying students are to be made fully aware of their responsibilities to land owners, and some basic Public Relations and Land Administration be included within the course.



5. Acknowledging the importance of photogrammetry in the development of P.N.G., the University is to investigate the possibility of running summer schools for this subject.
6. The Head of the Cartography section is investigating the possible compression/deletion of some of the mathematics at present being taught to cartographers to allow for more practical drafting.
7. A separate standard of entry is being investigated for the Drafting Certificate course.

Members are to note that the above is a summary taken from the Second Meeting and the Minutes of the meeting are yet to be confirmed.

Approval has been given by the University Council and by Cabinet for the establishment of a Chair of Surveying at the University. The position is currently being advertised.

It is reassuring to see the status of the profession in Papua New Guinea recognised in this way.

Vacation projects planned for the first break are as follows:

1. A continuing detail survey being carried out in Kankuman Village as a replanning project, by the Third Year Survey Technicians.
2. A visit to Wau and Bulolo by the Second and Third Year Valuers to carry out site investigations and studies of the surrounding plantations, and the Commonwealth New Guinea Timbers Company.
3. A Topographic Survey of a quadrilateral and centre point reading all horizontal angles with 1" theodolites, by the Third Year Surveyors and Survey Technicians.

By: K.I. Massey

I believe that the time has come for the Association to examine its structure and to decide if it is to continue as it is, or whether it will expand, and grow.

Many surveyors have already questioned themselves as to what the future relationship is to be between themselves and the Technician. Do we open the Club to any man who knocks at the door? Or should we just pretend we can't hear him and wait until he goes away.

I understand that the Technicians in Brisbane went away and started up themselves in Private Practice - and most successfully in most cases. A Surveyor may say "Well you won't find them carrying out Cadastral work" - and this is true, but they can deal just, if not more profitably with Engineering Surveys, Photogrammetric Surveys, Hydrographic, or even setting out buildings. An assessment of the average New Zealand Survey Practice showed that only 20% of a firm's income was derived from Cadastral surveys - and the bulk was composed of Engineering Surveys. This was also from where the cream of the Practice's income came.

Another myth is that the Technician has not got the background of knowledge in the surveying field. Initially this may be true, but with time and experience this knowledge comes. Admittedly there will probably be gaps which may never be filled, but conversely a large amount of knowledge that the Surveyor learns is also filed away, and never used again.

In my opinion it is time the Profession opened its eyes, and looked about. What is actually happening? I believe most of us can be honest enough to see that though the Profession is growing, it is growing very slowly. Certain spheres which used to be entirely the surveyor's domain are, or have, slipped away. For example:

Town and Country Planning  
Photogrammetry  
Cartography  
Valuation

New spheres, which fit quite readily into the Surveyor's training, such as:

Landscape Architecture,  
Environmental Planning

will also, no doubt, go the same way. Should we stick our heads into the sand, and pretend it's not happening? Are we prepared to continue the way we're going - "and to Hell with it all!" I hope not. Remember, as we become a smaller and smaller group, in comparison to other professions, so also do we have a smaller and smaller say in the management, and future development of those disciplines in which we are skilled.



I believe that we should re-examine the present structure of our Association and devise either, alternate divisions, or grades of membership. Let us now, whilst in a reasonable measure of strength hold out the hand of unity to associated disciplines and combine them so that we can talk on matters which concern us all from a position of strength.

I can quote some parallels here. The N.Z. Institute of Engineers in the middle 1960's offered Associate Membership to its Technician group. This did not give them the right to vote on Institute matters, but it did give them a place in the Institute. An Associate is entitled, if he so pleases, to produce a thesis on some subject the Institute nominates, which, if satisfying the examining board, gives the Associate full membership of the Institute. Many have availed themselves of this opportunity. They have also by legislation, acquired recognition for those of their Association who have never sat examinations, but by virtue of their ability, have risen to positions of responsibility.

The Royal Institute of Chartered Surveyors is composed of the six following divisions:

1. Building Surveying,
2. Valuation, Estate Agency and Planning,
3. Land Agency and Agriculture,
4. Land Surveying, Hydrographic Surveying,
5. Minerals Surveying,
6. Quantity Surveying.

Each division has its own Council, from which two are appointed to the General Council. Perhaps here is a solution to our own problems.

I must however make my apologies to you. Here I am, only in the country three months, and telling you how to run your Association. However, these suggestions are made in all sincerity - the problem is exactly the same in N.Z. and Australia. Perhaps Papua New Guinea, as an emerging nation, can give the example to fellow Surveyors "Down South".

## GROUP REPORTS

### Report from the Highlands - submitted by Mal Gray

Peter Jolley resigned from the "Territory" late November to take up residence in Brisbane and a new survey practice. He met his first wet season on arrival and burnt 3 bags of 2 x 2's (metric equipment excepted) cooking kai for his tribe and the Skehans.

While suspended by his toes from a young highland eucalypt on Xmas morn, Mr. Carson demonstrated to the under 5's in the audience the resilience of the human skull upon impact with concrete. 37 Vodka and oranges later Mr. Carson Mt. Hagen stated in a slightly concussed state that he was checking the verticality of his plummet.

D. Croft Forster has condescended to join Gil Hole's Boroko-based-boys, in the meantime he is enjoying a paid palaver and philandering at P.W.D. expense in Melbourne. It is to be assumed that on his return from the great south land of inflation he will take up residence in the Boroko squash courts.

John Hunter, after two illustrious seasons in the Highlands where no-one saw him, has also gone finish and is now working on high rise buildings in Melbourne.

Clive Carson and Noel Sharpe have purchased Peter Jolley's old practice in Mt. Hagen. Best luck for the new firm.

Noel Sharpe wasn't the most popular surveyor in the area when he left his assistant on Mt. Karimui without food for three days.

Ed Pailaitis became the proud father of a son "Guy" in early February. All are now home thriving in the Highlands climate.

John Wood has returned home after his first holiday in four years, and has fallen in love with New Zealand.

Mal Gray spent a week in Darwin during leave but missed seeing Bruce Sharp because he (Bruce) was spending his time in the sinspots of Singapore.

A \$30 phone call ascertained that Graham Bateman's son Todd was born early April and all are well. Graham is now working in private practice in Perth.

Wesley Loratung has joined the Geodetic Section of Lands Department in Port Moresby and is at present on loan to A & L learning more of the ropes from the "Bombastic".

Francis Kalpe joins the long retinue of surveyors who have departed from the Highlands. (Francis has gone to Rabaul.) Rumour has it that the new Filipino expatriate surveyors are destined for the high altitudes and we wish them well.



Report from Madang - submitted by Jason Garrett

Nickolas Bowden will shortly be getting married. He will transfer from Lae to Madang, and hopes to live off all the winnings from bets placed in Lae made on the above event.

Roger Machin has been transferred to Mt. Hagen by his partners after placing two of them 0.5 secs behind the winners in the recent national yachting time trials. Roger was the timekeeper.

Gerald Saunders will shortly be coming to Lae - with web feet after 10 months in the Sepik swamps.

Yours truly has finally been caught by the candid camera, boots, theodolite and all. (Doing a little more justifying for the scale of fees Jason?)

Michael Conrad Lenz to the private game in July? Could be a shock to the system after a pleasant time with P.W.D. Good luck Chris and Mick.

Report from Rabaul - submitted by Stuart Scriven

Scruffy Kendall and Dave Rumble at present are on an arduous field trip, aboard the Lahara doing astro fixes on Tingwon Island, Manus and the St. Mathias Islands. They were seen boarding the trawler in Rabaul with fishing rods, nets, rifles and golf clubs. Rumour has it that a theodolite was seen amongst their equipment.

Des Husband went finish to Brisbane at Easter and we wish him and his wife all the best for the future.

Malicious gossip is being spread that Stuart Scriven ordered tomato juice for himself at the Sunday night Yacht Club pictures.

Report from Lae - submitted by Alan McCarthy

Bob George is back in town wearing an outsize T shirt advertising the International Bill Fishing Tournament out of the Bay of Islands in New Zealand. Unfortunately the participants were beaten by a well known group of international fishermen, and most managed to catch nothing but colds.

Mike Kellock at the University in Lae, and family in Brisbane, must almost hold a commuting record. Perhaps mentally anyway. Fay and children will shortly return to Lae.

Ted Nacino looks forward with interest to the arrival of his "Wantoks" from the Philippines. Lands Department expect to receive the first contingent shortly.

Report from Lae

Now departed A.J.S. has done the trick again, much, we believe, to his horror. The new addition to the Skehan family will arrive in the spring.

Ivon Bryning has again departed to West New Britain. We are not sure what is the attraction, but it is awfully strong. With Ivon it could only be a damsel in distress or the almighty dollar.

New Surveyor Ken Massey journeyed to Goroka as a tourist recently and missed his ride home for dubious reasons. Not to be daunted he began the long trek, but was smiled on by fortune and changed the mode of transport. Just as well because if the bull-bars don't get you then t.b. from the dust will.

Lady Luck smiled for Pam and Alan McCarthy at the Melanesian recently. For the youngest wife with the most children came a bottle of Burgandy and a free dinner, another example that high productivity pays (sometimes).

Report from Port Moresby

zzzzzzzzzzzzzzzzzzzz



# Ninth Survey Congress

BOUGAINVILLE - - - - - JULY 15th - 19th 1974

## Comments from the Congress Committee

We are very pleased with the large amount of interest being shown in the coming Convention. There have been inquiries from as far away as Sri Lanka and India, and we have a registration from Japan.

Delegates will have the opportunity of meeting the Chief Minister of Papua New Guinea, Mr. Michael Somare, who will be officially opening the congress and attending the President's Cocktail Party on Arovo Island.

Tuesday evening will include a smogasboard and informal drinks at the R.S.L. at Toniva, followed by films on Bougainville and the mine.

At the Davara Hotel on Wednesday will be a poolside fashion parade during luncheon. Wednesday evening will be the Annual Dinner Dance.

All day Thursday will be spent at Panguna with a tour of the mine in the morning and papers in the afternoon. There will be an early dinner at the Panguna tavern before returning by bus to Kieta.

The A.G.M. on Friday will be on Arovo Island. That evening delegates will return to Kieta for the farewell barbeque at the adjoining residences of Don Smith and Colin Hard.

## The Technical Sessions

At present the Committee are reviewing some of the Technical Papers to be presented to the Ninth Survey Congress. This aspect of our Convention promises to provide Members and Registrants with information and knowledge which will be both stimulating and beneficial to the profession.

Technical papers include the following:

1. The Adjustment of Single Traverses,  
by Brian Murphy, Head of the Department  
of Surveying at the University of Melbourne.
2. The Maximum Retrieval of Information from Photogrammetry,  
by Ian Powell, Manager of Capricorn Aerial  
Mapping Pty. Ltd.
3. Automated Computations and Plotting of Urban Subdivisions in the A.C.T.,  
by Bill Kennedy, Surveyor General of Australia.

## Ninth Survey Congress

4. Freehold Land in Papua New Guinea - An Alien Concept,  
by Mick Eccleston, Principal Valuation Instructor,  
P.N.G. University of Technology.
5. The Effect of the Commission of Enquiry into Land Matters on  
our Profession,  
by Kisokau Pochopon, Associate Surveyor General  
of Papua New Guinea.
6. Re-establishment of Position by Resection to Known Points,  
by G.J. Andrews, Lecturer, Surveying Section,  
Queensland Institute of Technology.
7. A Review of Survey Aspects of the Bougainville Copper Project,  
by Allan Cullum, Chief Surveyor,  
Bougainville Copper Ltd.
8. The History of the Bougainville Copper Project,  
by D.C. Vernon, General Manager,  
Bougainville Copper Ltd.
9. Reflections on the Development of Land Surveying Courses,  
by Peter Davies, Principal Lecturer in the  
Department of Surveying, Royal Melbourne  
Institute of Technology.
10. The Role of the Calculator - Past, Present and Future,  
by Bill Thomas, Calculator Sales Manager,  
Hewlett Packard Pty. Ltd.

All enquiries should be addressed to:-

Mr. Bryan McLennan,  
Congress Manager,  
P.O. Box 430,  
Arawa,  
Bougainville,  
Papua New Guinea.

For the Ninth Survey Congress, the Congress Committee consists of the following members:

Bryan McLennan,  
Allan Cullum,  
Colin Hard,  
and Don Smith.



# EIGHTH SURVEY CONGRESS AUDIT

## Receipts

Total money received for Registrations and the Sale of Congress Proceedings.  
(This amount was taken off the bank statement and checks with the deposit book record.)

|                                                                |                  |
|----------------------------------------------------------------|------------------|
| Interest Payment                                               | \$4172.00        |
| Refund from barbeque for glasses, sale<br>of bottles and so on | 4.57             |
|                                                                | <u>103.68</u>    |
| <u>Total Receipts</u>                                          | <u>\$4280.25</u> |

## Payments - Cheque Account Number 12 0620.

|                                                      |          |          |
|------------------------------------------------------|----------|----------|
| 1. Refund of Registration,<br>Ken Blaick             | 691619   | \$40.00  |
| 2. Tony Naughton, Petrol                             | 691609   | 3.00     |
| 3. Simon Andropoff, Petrol                           | 691622   | 10.00    |
| 4. Printing of Papers                                |          |          |
| P.N.G. Printing                                      | \$331.00 | 691612   |
| Labour, printing                                     | 45.50    | 691607   |
| P.N.G. Printing, covers                              | 18.65    | 691608   |
| Paper, University of Tech.                           | 9.43     | 691621   |
|                                                      |          | \$404.58 |
| 5. Typing - Congress Papers<br>and correspondence    | 691620   | \$150.00 |
| 6. Morning teas                                      |          |          |
| University of Technology                             |          |          |
| Staff Club Caterer                                   | \$100.00 | 691616   |
|                                                      |          | \$100.00 |
| 7. Ladies Functions                                  |          |          |
| Luncheon at the Vice-<br>Chancellor's residence      |          |          |
| Staff Club Caterer                                   | \$22.00  | 691616   |
| Outstanding amount                                   | \$20.59  |          |
| Boat Trip                                            | \$13.00  |          |
| Morning tea catered by the<br>Kosy Korner restaurant | \$10.00  | 691610   |
|                                                      |          | \$65.59  |
| 8. Band                                              |          |          |
| Windup barbeque                                      | \$80.00  |          |
| President's Cocktail Party                           | 60.00    | 691613   |
|                                                      |          | \$140.00 |

# Eighth Survey Congress Audit

|                                                                                              |          |                  |
|----------------------------------------------------------------------------------------------|----------|------------------|
| 9. Melanesian Hotel                                                                          |          |                  |
| Annual Dinner                                                                                |          |                  |
| Luncheon and Fashion Parade                                                                  |          |                  |
| President's Cocktail Party                                                                   |          |                  |
| Symposium room, afternoon<br>tea                                                             | 691617   | \$2090.59        |
| 10. Hotel Cecil                                                                              |          |                  |
| Cheese and Wine Luncheon                                                                     |          |                  |
| Afternoon tea for seminar                                                                    |          |                  |
| Charge for the band                                                                          | 691615   | \$434.00         |
| 11. Cheque book                                                                              |          | \$1.25           |
| 12. Barbeque                                                                                 |          |                  |
| W.R. Carpenters                                                                              | \$186.75 | 691601           |
| N.G.I. Soft Drink                                                                            | 27.60    | 691602           |
| S.T.C. Spirits                                                                               | 148.30   | 691603           |
| K. Cole, Ice                                                                                 | 14.00    | 691604           |
| G. & K. Serafini                                                                             | 15.90    | 691605           |
| S.P. Glasses, jugs                                                                           | 12.60    | 691606           |
| Flowers                                                                                      | 10.00    |                  |
| Doug Sabov                                                                                   | 375.00   | 691614           |
| G. Sparkes-Carroll                                                                           | 30.00    | 691618           |
| Labourers                                                                                    | 25.00    |                  |
|                                                                                              |          | \$845.15         |
| 13. Plastic badges for Delegates                                                             |          |                  |
| P.N.G. Printing                                                                              |          | \$24.00          |
| 14. Expenses for Committee, car,<br>postage and so on                                        |          | \$10.00          |
| 15. Electricity in houses supplied<br>on campus for some Delegates<br>(5 houses)             |          |                  |
| Connection fees                                                                              | \$25.00  |                  |
| Meter charges                                                                                | 10.43    |                  |
|                                                                                              |          | \$35.43          |
| Cheque Number 691611 was mis-written and cancelled. Cheque<br>Numbers 691623 - 5 are unused. |          |                  |
| <u>Total Payments</u>                                                                        |          | <u>\$4353.59</u> |
| Loss made by the Eighth Survey Congress                                                      |          | <u>\$73.34</u>   |



THE CONSTITUTION OF THE ASSOCIATION  
AND ALTERATIONS FOR THE FUTURE

Chairman: Mr. E. (Barrie) Valentine - President of the Institution of Surveyors, Australia.

Speakers: Mr. Kisokau Pochopon - The Surveyor General elect.  
Mr. Francis Posanau - Lands Department Staff Surveyor.  
Mr. Peter Jolley - Private Practitioner, Mt. Hagen.  
Mr. Gil Hole - Principal Surveyor, P.W.D.,  
Chairman of the Constitutional Planning Sub Committee.

The First Speaker - Mr. Hole

I think that this subject has the danger of being over exposed, and a lot of our members are losing interest with the issue.

The objects of our Association include the following:

"To promote the practice and science of Surveying in all its branches, and the usefulness and efficiency of persons engaged therein.

To raise the character and status and advance the interests of the profession of surveying and those engaged therein.

To promote and safeguard the interests of the profession of Surveying generally."

I shall go on a little bit further to where it mentions the qualifications of members, and it says basically to be a corporate member the person shall hold a Certificate of Competency or a Degree in Surveying.

The original intention was to form a professional Association comparable to those overseas.

I think that the Association is now strong enough, and big enough, to be able to eliminate this business of getting anybody who can look through a theodolite into the Association for the sake of having them. So I will go back to the Constitution as it was originally written, and it says that the intending member must hold the qualifications mentioned previously.

I cannot see why you want to change it. The country is going to have a lot of its work done by technicians. The responsibility of the work being carried out is still going to be with the professional surveyor, for example in my own case we must be responsible for work done by technicians before it goes to the design engineers.

The Constitution of the Association  
and Alterations for the Future

So I will close my speech - you have a good Association especially now that it is developing into an Association of Papua New Guinea. We already have two P.N.G. councillors and this does not mean a lowering of standards for the right of corporate membership, the opposite should apply - they have their degrees from Lae and there is going to be more and more of them - if you want a good viable Association that can take its place with other professional groups I suggest you maintain the quality of professional surveyors and members of our Association.

The Second Speaker - Mr. Jolley

I would prefer to turn this session into one where we can draw from the experience and feelings of the members. Essentially I take some issue from Francis's remarks yesterday and I quote briefly from his paper.

"I believe that the Association of Surveyors of P.N.G. will have to change its attitude and re-organise itself to suit the needs and aspirations of the country. These changes are inevitable, they will have to take place because we have done little in this direction to suggest that we are developing this Association towards a Papua New Guinean type of organisation."

I think that the Association has done a lot and it is prepared to adapt to change. The onus now rests with our local members. They have called for change, we yet don't know what change they want. The Association will back any changes that are obviously for the benefit of the country.

I look forward to hearing Francis's and Kisokau's comments on what I have said and I will leave it at that. Thank you.

The Third Speaker - Mr. Pochopon

I actually do not have very much to say on Constitutional changes for the Association, what I have in mind is the bringing in to the Association our brother and sister professions.

From the Government's point of view I think I can see that the Government of the country would probably have the view that Associations such as ours doing things more for the people.

Also the numbers of members of our Association might drop drastically with independence, and because with unity there is strength, so an amalgamation with other organisations might create a stronger group.

Just recently when I was in Kuala Lumpur there was a forum consisting of the Association of Surveyors, Malaysia, the Institution of Engineers, Malaysia, the Malaysian Institution of Architects and the Malaysian Institute of Planners. What they were trying to achieve for the community



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as a whole would probably have a better effect on the government of the country than just one Association working on its own.

Hence in conclusion I feel that the amalgamation of allied professions would be an advantage to Papua New Guinea in the future.

The Fourth Speaker - Mr. Posanau

In concurrence with Kisokau's ideas I would suggest that professions closely allied to our own are the Valuers, Town Planners and others connected with work related to land.

If these professions work together then duplication of efforts may be avoided.

With regard to reorganisation, the Association is not getting into the heart of the people, we are not keeping in touch with the government and its ideas, we are too far away. Can we possibly adapt ourselves to the situation by looking into better ways and methods so that we can be appreciated as a profession in this country? Thank you.

Mr. Valentine

I think you will find gentlemen that there seems to be a change from yesterday, obviously some thinking has been going on.

Mr. Hole

There seems to be two issues at stake, whether we should open our ranks to survey technicians and the idea of amalgamation of our Association with other professions.

Mr. Richards

Kisokau came very close to the situation by paraphrasing President Kennedy who said, "Ask not what your country can do for you, ask what you can do for your country."

I do believe we have to open the ranks to technicians, not necessarily as corporate members. Papua New Guinea today is like Australia was fifty years ago, in that surveyors then had the same educational qualifications as today's technician.

The more academic skills of the graduate surveyor will be used in surveying control and the technicians will be used in the cadastral work, and the breaking down of the control.

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Mr. Matheson

As one of the founding fathers of the Association I have taken an interest in Kisokau's idea of the amalgamation of allied professions. At the moment there are a dozen town planners and about eight valuers in Papua New Guinea, while our membership stands at 130. These people would fear being swamped by an Association of our size, any approach will have to be made by them. What we need in the meantime is a bit of propaganda.

The other aspect of the technicians. Nobody will want to join an Association where they are a second class member. They are going to want to have a say in what is going on. Also if we are going to be a professional Association we must keep our standards. They will be better off by forming their own Association, we can give every assistance and support and make sure that they are happy working with us.

Mr. Mennis

I consider that both topics are valid to this seminar.

I don't agree with Graham's point that we have to wait for other professions to come to us. If we are going to stay as an Association of Surveyors these people will never come. If a separate institute is formed, and we deliberately invite these people to discussions and let them feel they are being brought fully into it, I don't think there would be a great deal of objection. Certainly with goodwill on all sides, which is the point I made in the article in the Journal before last, being the main ingredient.

Mr. Valentine

Do you actually mean to amend the Constitution of this Association or form another Association?

Mr. Mennis

I have not actually got this far, I threw this up to get suggestions going. My own idea is an Institute of Land Economy. Whether this is done by amending the Association's Constitution or forming a new Institute is a matter for the future. It is up to the local members to make up their own minds and do their own negotiations with assistance from us.

Mr. Brown

I think we should have two Associations, one for corporate members and another for survey technicians. Also I can see no point in joining with other professions.



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and Alterations for the Future

Mr. Skehan

It seems that one purpose of an Association is to present a united front to whatever adversary we may have. Now I think we might be placing too much importance on the numbers in the Association. With our Association we can present a united front to those who wish to employ surveyors. The fact of numbers does not matter much, if they are bunged together, this fact gives them the strength to speak strongly. The admission of other professions can only lead to dissention.

We certainly need to keep technicians with us, possibly as a different grade of membership because they certainly are important to us.

Mr. Bruce Forster

I think the idea of an Association formed by joining different professions for the sake of numbers is not the point we are making.

In the early days of Australia the Surveyor was not only an angle and distance man. This has come about in the last 50 years as we have tended to specialise in this area. Fifty years ago the surveyor was a man who could encompass some valuation or land economy, some town planning, some cartography and today even photogrammetry. I would see an amalgamation of such professions as a joining of philosophies all connected with the land unit. The surveyor measures the land unit, the cartographer portrays the land unit, the valuer assesses it, the town planner designs the subdivision of this land. At the University of Technology I am attempting to design a school of Land Studies. We have these various groups at the moment in the Department of Surveying and I would like to see in our Survey degree some subjects more related to land studies. The surveyor for this country should not just be an angle and distance man, he should be a man who can determine what soils are what, tree types, and the geology of the area so that he can tell planners of the potential of the area.

Now I feel that an Association of the professional groups of surveying, valuation, land economy, if it comes, cartography, photogrammetry will produce a union of ideas in an Association which will be much more responsive to the government's needs, much more responsive to the future priorities of this government which is turning to the rural sector. They are not interested in a man that can measure a line to 1 in 8000 accuracy. They are interested in a man who has thoughts and knowledge to the whole aspect of land. If we narrow our ideas to just being a geometrician, I think that we won't be serving the country as the full benefit of a combined Association could.

The Constitution of the Association  
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Mr. Aschhoff

Is there provision in the Constitution for Associate members to advance to Corporate status?

Mr. Hole

Yes.

Mr. Van As

The talks at this congress have indicated the mapping aspect of the Surveying profession will dominate the activities of surveyors in this country. It has also brought out the poor performance of mapping in this country. This poor performance is not due to clerks and administrators, it is due to the surveyors, his apathy towards it.

The future surveyor is going to have to adopt a completely fresh attitude. So if we have problems here with mapping, they can be blamed on the insular attitude of surveyors in this country.

Mr. Carson

At the moment we are mainly licensed land surveyors and corporate members of the Association. The public would also look at the cartographer, photogrammetrist as being part of the field of surveying.

I do feel the cartographers, the skilled men in mapping, should be allowed into our Association, if not we should change our name to Association of Licensed Surveyors.

Mr. Hole

Yes, I heartily agree with Mr. Carson and with Mr. Van As. We must broaden the ranks of what we define as a surveyor, it must cover cartographers and photogrammetrists. I don't think we want to go too far and get into things like land economists and probably valuers and town planners. With the type of work that surveyors will be engaged in they should be members of the Association while still professionals in their own right.

Major Laing

I believe there is room in an Association like this for trained topographic photogrammetrists and the like, apart from those who have that magic L.S. behind their name.



The Constitution of the Association  
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Mr. Jolley

In terms of the future of the Association the only person competent to stand up and speak are our local members.

Mr. Larmer

I agree with Mr. Jolley's remarks. I think that the local members have to decide the future, not us. In Francis's paper he said the people who see mastamaks out in the field consider them surveyors whether they have L.S. after their name or not.

Mr. Bassett

In the future all the field work will be done by survey technicians. We have to give them guide lines, get them into the Association.

Another consideration is propaganda towards getting more students into the survey technician course.

Mr. Forster

I think that Mr. Jolley is being paternalistic towards our local members. We are all members of this Association, the local members don't want to be differentiated as being a special member. Don't put all this on their shoulders and let them bear the burden of some future action. Everyone must speak and not shirk our duty, and let them decide. This is an attitude the reverse of racialism where it is your pidgeon, you decide. There is a lot of experienced members of the Association who can give good advice to the Association.

Mr. Jolley

If I gave the impression of being paternalistic I certainly did not mean to, because that was exactly the attitude I was trying to get away from. The experience being given is only in the minds of the beholders. How do we know that the experience we are giving our local members is what is needed in Papua New Guinea?

Mr. Matheson

Mr. Chairman, the seminar is getting away from the point. You don't have to be a licenced surveyor to be a corporate member of the Association. Secondly our President tells us technicians are surveyors; they are not surveyors. A man must be a professional in his own field. The main problem is what constitutes professional qualifications in other fields such as cartography and photogrammetry. These people should be admitted as corporate members.

Mr. Hole

There will probably be some changes to the Constitution at the A.G.M. tomorrow.

The Constitution of the Association  
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Mr. David Forster

With all our talk about the abilities of the professional surveyor how many of us would consider themselves experienced in more than two or three aspects of the surveyors' curriculum. Could it be that we are only technicians?

Mr. Valentine

My summary may be a little supervicial after the preceding talk. Let me re-iterate on several points which came out in discussion today.

Firstly the organisation will fully support the setting up of a technician Association. The standards should be kept. Kisokau mentioned that he was interested in bringing in other professions dealing with land, they won't lower their standards, and they might form without us if we have lower standards.

Mr. Richards favoured technicians coming into the Association.

Mr. Brown hit a specific point when he said what does it matter if the Association drops to 10 members.

Finally Mr. Bassett made the crowning remark when he said in a very short time technicians will be doing all the field work.



Chairman:

Mr. C. Van Sinder Deputy Surveyor General, Canberra.

Speakers:

Mr. K.F.J. Aschhoff Head, Survey Technician Course,  
University of Technology, Lae.  
Mr. J. Sipuman Staff Surveyor, Electricity Commission,  
Graduate from Lae.  
Mr. B.R. McLennan Regional Surveyor, Bougainville.

Mr. Van Sinder

Land Tenure is the way in which people obtain, use and distribute rights to land. It was mentioned earlier this week that one never owns land but merely owns the rights to the land, and these rights are alienable, in other words they can be passed on. The manner in which land rights are passed on is a measure of the land tenure system employed by a group of people.

We have three speakers today. Mr. Aschhoff has been in PNG for twelve years. Mr. McLennan is the Regional Surveyor from Arawa; he has been in PNG for six years. Last, but not least, is Mr. Sipuman. He graduated from the University two years ago and comes from the Manus Islands.

The First Speaker - Mr. Aschhoff

Papua New Guinea is having difficulty at the moment in finding a system of land tenure which is workable for the whole country. On the one hand we have the European land laws which have been imposed on the country, and on the other we have the customary land laws.

There should be one system for the registration of titles which satisfies the customary rights of the local people. This system of registration must enable the easy transfer of land.

In the particular way in which development is continuing in PNG, land is acquiring an economic value, and is not readily available any more, but it is still necessary for development.

Mr. Amevo, although not with us today, suggested to me that some of the problems of land dealings has come about because unqualified people were allowed to execute land purchases.

The people have the ingrained feeling that in earlier days the white man was out to steal land, and used the Administration for this purpose.

In earlier years subdivisional surveys have been carried out which have made no provision for access, roads and other services.

There are now some areas where it is impossible to carry out survey work because the people just will not accept it.

I have no solution to the problem, but I hope that somebody will come up with a system which will work. In years to come, when the technicians go out to do survey work, if they do not have guide lines and a system accepted by the people, they will need a police or army guard.

The Second Speaker - Mr. McLennan

Following on Mr. Aschhoff's comments on demarkation, on Bougainville, where I come from, we have just completed two such projects. They became necessary because of the copper project, where some 25,000 hectares of land were required for mining purposes and the disposal of tailings. All the indigenes of the area had to be compensated because of the loss of their land.

Here was a situation where it was obvious that the individual lots needed to be marked, and we had the full co-operation of the people. It is worthwhile pointing out that the survey of the smaller block was carried out successfully by technicians working inside a fully controlled area.

We must accept that there are alternatives to the existing introduced tenure system. In Zambia the government has compulsorily acquired all land held under customary land rights, and this land will be re-allocated by the government as they see fit.

Something that the government might look into in the future is a system of land economy where large tracts of customary owned land could be put to better use for landless people.

The paper by Jolley and friends to be presented tomorrow looks at the problem of the re-allocation of alienated land. The inefficiencies of the present method create delays of up to two years from date of purchase. It occurred to me that this is one case where decentralisation could be applicable. If in all our centres we had District Land Allocation Boards, then applications could be handled more smoothly.

Two years ago in Rabaul we were all addressed by the Chairman of the Public Accounts Committee. He suggested that we must have far more rapport in Port Moresby with the government, and our Association should go to some pains to make ourselves known. We certainly have the members capable of selling our cause, let us see what we can do about it. Thank you.

The Third Speaker - Mr. Sipuman

Mr. Chairman, Gentlemen. I think all of us know, to a certain degree, how valuable a piece of land is, if situated in the heart of a city. Some people invest their money in such land and in a few years the land value would be two or three times the original investment. We know that generations after generations once lived on the land, developed it and then passed away.



Land is a key factor in our livelihood, it means wealth, it is a landmark of our civilisation. To the natives of Papua New Guinea their land is their whole existence. For the land is their arms and legs, their whole being. Their whole existence depends on the land, for food, shelter and recreation. Whether legally or not, taking land away from a native, suggests a hidden conflict generating from deep inside. Sooner or later such a conflict will burst, causing bloodshed, tribal war, together with all the other evils following. This will happen in Papua New Guinea unless a solution can be found.

To those who have been brought up in the village it is quite fascinating to hear the old men in the village telling about clashes in the past. It is interesting to hear the number of times there has been bloodshed over a particular piece of ground. Why all these fights? They are fighting for their livelihood, their wealth, happiness and pride. It is all in the land. The old men are emphasising, "stay on your land, it is yours, never let anyone take it away from you."

May I extend this message to the people concerned, I hope this will drive them to find solutions. To those responsible, let us look at the method used by the old men, the village council. The council locates and establishes the local boundaries by peaceful and simple means. The council's task is to supervise, establish and record the major tribal boundaries. The internal boundaries are left to the individual clans and the council's representative. With such boundaries natural features are chosen for the purpose of marking the land. With such a system less problems arise as to who owns what of the native land. If these boundaries are recognised, then the people will use their land more for development of new industries. The people will be able to use their land as security for creating businesses. We have come to recognise today that many Papua New Guineans have been rejected when applying for loans to form businesses, because of insufficient assets to use as security. With the opportunity of being able to borrow more money small businesses owned by Papua New Guineans may be expanded bringing greater wealth to the people. Thank you.

Mr. George, Lae.

As we have a lot of overseas delegates here I would like to hear one of our local members give a brief rundown on the various rights pertaining to customary owned land.

Mr. D. Forster, Mt. Hagen

The paper titled "The Financial Aspects of Alienating Land in Comparison to the Survey" which myself and colleagues are presenting tomorrow morning contains a lot of information on this matter, and I suggest that delegates attempt to read it.

Mr. Brown, Port Moresby

I wonder if we have the right to even attempt to create a workable system of land tenure, when for this country to achieve nationhood it does not need it. The theory of land tenure is very much involved in education, and the majority of people being uneducated, then nobody has the right to form a policy on land tenure until the next generation. We already have a land tenure system for each lingual group, and the people will abide by their own system. With a greater spread of education and progress in nationhood, I feel a land tenure system will evolve naturally.

A system of land tenure which is forced on the people will not work, look what is happening at the moment.

Mr. Van Senden

I would like to see some suggestions coming from the Association to the Commission of Enquiry into Land Matters, even though the profession has no representative on this body.

Mr. McLennan

In a conversation with the indigenous District Commissioner recently, he said to me that in their area the people do not want another system of land tenure as they already have their own. There are other areas where, by virtue of the economic development, or because of close settlement, or the shortage of land for some indigenous people, the tenure they held over the land is very important to them, and in two cases I have found, namely Rabaul and Bougainville, these people are anxious to have their boundaries delineated by us.

In the demarcation areas on Bougainville we have not placed cement pegs because a lot of the areas are going to be mined away, and the outer surround was rigidly controlled. What the people wanted was their area of land for compensation purposes, and this would be the case for development purposes when an indigenous owner wants to know what area he owns so that it may be used as a negotiable asset.

Mr. Kelly, Architecture Student, University of Technology

I come from the Western Highlands and my point of view is that we have our traditional system of land boundaries where we use natural features between the tribes.

I don't know how a surveyor marks the land, maybe he wants to have his own indications of where the boundaries lie. I think that we cannot use that idea very well, and we must follow our system, and this should be done on a communal basis where a tribe has title to the land, not an individual. Land means existence for us. To a white man it is a business asset. The price may go up, the price may go down. We cannot introduce any tenure system whereby our land may be disposed of. I am educated but I know that if I have any tribal land it is mine and I don't have to spend any money on it, and I want a title for it.



Mr. Van Senden

Perhaps I can say that if you can describe a parcel of land then it can be surveyed and the ownership registered.

Mr. Richards, Lae

Many years ago when I was working out of Mumeng two groups approached me with a problem on their common land boundary. In this case one corner was an old dead tree which had disappeared, and the dispute was over 500 metres of land according to where each group thought the dead tree had been.

My point is that if the boundaries had been surveyed then each group would have a title to their land protected by the government, and the correct boundary could be easily re-established.

Mr. B. Forster, Lae

I would like to hear Mr. Sipuman's comments on a property boundary, as it is my impression that the Papua New Guinean concept of a boundary is far more fluid than our own idea, and a boundary can have certain tolerances. Also can Mr. Sipuman make comments on a graphical cadastre where marks are not placed in the ground, but the boundary is delineated on a map or an aerial photograph. This would then define a strip of land in which the boundary was supposed to lie.

Mr. Sipuman

Your first point is not exactly correct as it depends on the situation. The boundary of a piece of land might be defined by trees especially planted for the purpose, or it can be a river or the imaginary line joining mountain top to mountain top. I cannot comment on the second point.

Mr. Larmer, Port Moresby

While I might agree with Mr. Brown that we cannot foist a land tenure system on Papua New Guinea, if the people want to borrow money to start a project, they cannot borrow money on a title to land which they do not actually own because at any time the tribe over the hill can take the land from them by right of conquest. If Papua New Guineans need development funds which we all do if we are going to develop anything, no one is going to give money without some form of security. Then this country will not develop until a system evolves whereby there is a workable land tenure system.

In certain areas I don't blame the local people for getting hot under the collar with regard to good garden land, or hunting land, which was sold, signed and paid for fifty years ago. However, when the Motuan people, two or three clans from Port Moresby and a couple of other groups lay claim to a little low valley which was all grass and too much rock, and the nearby hills which were too steep for gardens, and the Motuan people freely admit they never went near the hills, but now the white man has come and built

houses on those hills and how those hills are worth money, then they want it back; then this is sheer greed, nothing else. Thank you.

Mr. Posanau, Madang

It is all very well to speak about the customary ways of marking land, but I think the time will come when our people themselves will be more involved with land for businesses and development, and proper surveys will be required.

I would like Mr. Sipuman to further explain his use of village councillors and supervisors with the marking of land. As we will see in future years, title to our land will need to be guaranteed by the government, protected by the government, if necessary, and it will be necessary for our businesses and development.

Mr. Sipuman

I think that the people coming from the University will be those people employed by the council in registering and recording the land. Then, from the records, we will know who owns what, and in that way if disagreement arises it may be easily solved.

Mr. G. Sparkes-Carroll, Port Moresby

The idea put forward by Mr. Sipuman that the whole country can be marked out into tribal and clan lands using the technician output from the University of Technology is a momentous one. The second idea that this delineated land recorded on a deed of title can then be used as security for the purpose of borrowing money calls for some thought.

Machinery already exists for this through the Land Titles Commission under the Land Tenure Conversion Ordinance whereby, in effect, a single owner or a clan as tenants in common can get a Torrens title to a piece of land, and can then use this title to borrow money for the purpose of starting a business enterprise.

I don't know if Mr. Sipuman is aware that if the enterprise loses the borrowed money then it may forfeit the land put up as security.

Mr. Sipuman

If the business goes bankrupt, then the land is lost.

Mr. Mennis, Madang

It is a while since I read the Land Titles Ordinance, but from memory it does say that an indigenous land owner does not forfeit to the bank.



Secondly Mr. McLennan put forward the idea that there should be local bodies set up to control the purchase of land for development and other dealings. This was precisely the system put forward by the Director of Lands, Mr. Grove, in the Land Laws several years ago. They were obviously not agreeable to the House of Assembly. As a matter of interest I put forward a somewhat similar submission to the Commission of Enquiry into Land Matters which is currently sitting in Madang.

Professor Angus-Leppan, University of New South Wales

Mr. Chairman, I think that we are seeing the disease of Tororus Necaea which is people not prepared to stick their necks out.

In order to encourage people to stick their necks out I would like to ask a very innocuous question; does the panel think that the Australian type of cadastral survey, 1 in 8000 and all that, has any future in Papua New Guinea?

Mr. McLennan

For urban surveys, yes. In rural areas the survey directions allows 1 in 2000. In rural areas I do think there is a greater need for overall survey control.

Mr. B. Forster, Lae

It seems to me that the main problem is the dispute over the actual land boundary, and how a title can be obtained which can be used to obtain a bank loan. Surely within each clan land there is land which adjoining clans definitely recognise as belonging to the first clan. There might be an area of no-man's land, but could not we have a system whereby you have a boundary which is beyond dispute, and thereby a negotiable commodity?

Mr. Van Senden

I wonder, as an outsider, if too great an emphasis is being put on borrowing money at this time. Do the people really want to borrow money, and if so, what for?

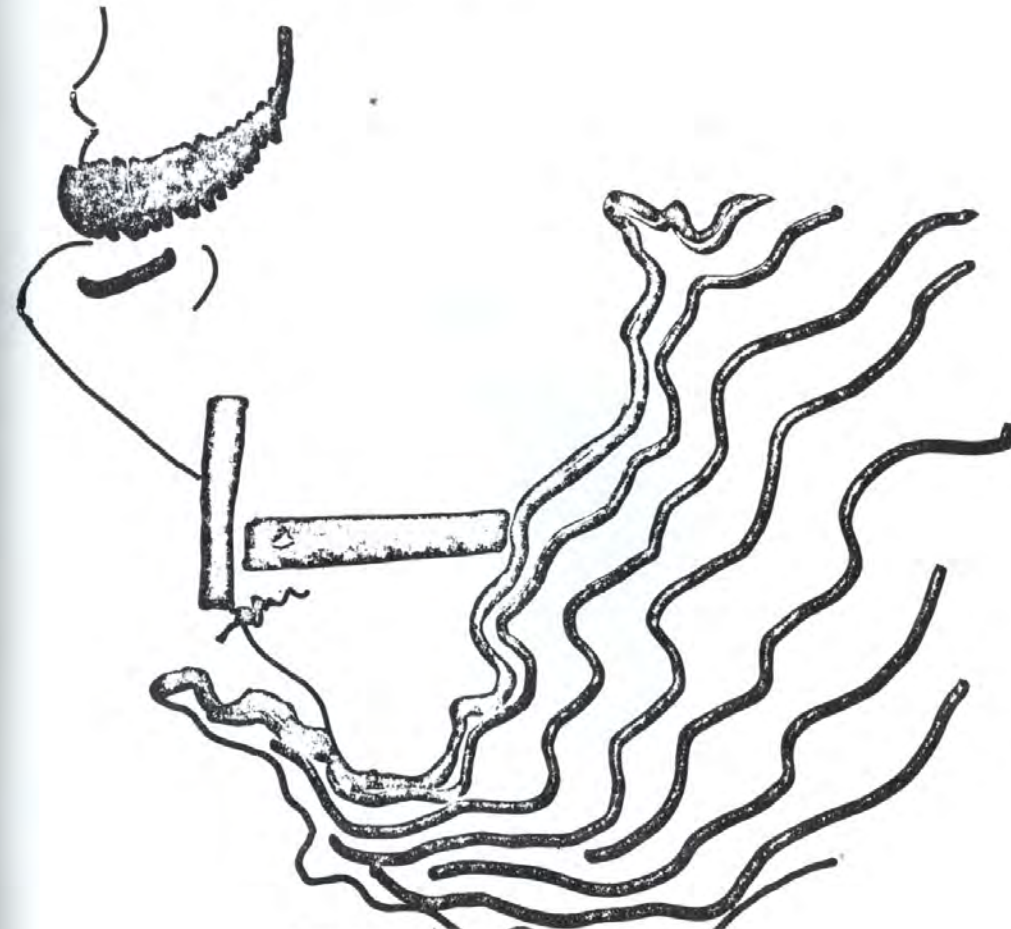
Time has ran out, so I will summarise the points made by the three speakers.

Mr. Aschhoff said it might be necessary for the government to acquire all the land and then re-distribute it. I feel that such an action would not be wise.

Mr. McLennan thought that the present system did not have a great deal wrong with it, there was ample room for any modifications thought necessary.

Finally Mr. Sipuman pointed out how land was the life blood of the indigenous occupier, and any land tenure system must be aware of the peoples' feelings for their land.

My commendations go to the three speakers in putting views to the seminar for the purpose of promoting discussions, and I would like everybody to show their appreciation in the normal manner.



Something from the C.M.B.?



Department of Public Works,  
P.O. Box 1108,  
BOROKO.  
PAPUA.

The Secretary,  
Association of Surveyors P.N.G.,  
P.O. Box 793,  
LAE.

Dear Sir,

It is readily agreed that since the data of the last increase of the scale of fees ( 1971) all costs have escalated by at least 20%. However, I cannot help but wonder if the Government is really getting its moneys worth from the Consultant Surveyor, especially at the new rate for expatriate surveyors being sought by the Association.

From my two years with the Central Mapping Bureau, I can say from experience that a large proportion of the work handled by private surveyors was rejected first time through the Stereo Plotters because of faulty work.

More recently with the Public Works Department, the following general faults with the Consultants work have been found.

- (1) The P.W.D. Standard Survey Instructions are not studied fully. Consequently work is not carried out in the requested manner or presented in the proper format. A P.W.D. circular dated 11th July 1972, "Compliance with Standard Survey Instructions", was sent to all Consultant Surveyors, but with little improvement.
- (2) When survey is required for engineering design a fair amount of judgement is required in the field and it is not until one is on the ground that it can be assessed what is relevant and what is not. Although survey briefs cannot possibly cover all the variables we find that Consultants are inclined to follow them to the letter and in many instances insufficient information is obtained.
- (3) In a few instances it can happen that the costing of a job is incorrect or that the survey method or accuracies requested are impractical due to the fact that the officer writing the brief may not be familiar with the area to be surveyed. In these cases, the surveyor should assess the situation once on the site and advise as necessary. Unfortunately, it is usual for the consultant to carry on anyway even if somewhat dubiously.

From the observations, I feel that it is doubtful that the Government is getting full value for money but at present while there is such a shortage of surveyors in this country and the law of supply and demand prevails, this situation will stay with us.

Yours faithfully,

D.R. JOHNSTONE  
Acting Principle Surveyor.

- - - - -

Dear Sir,

Ref. your letter of the 19th March.

The following are the positions and the substantive occupants of the positions.

|                                      |                    |
|--------------------------------------|--------------------|
| Surveyor General                     | R.G. Matheson      |
| Associate Surveyor General           | K. Pochapon        |
| Assistant Surveyor General           | C. Sparkes-Carroll |
| Associate Assistant Surveyor General | F. Posanau         |
| Regional Surveyor                    | T. Jackson         |
| (5 positions)                        | B. Mennis          |
|                                      | M. Grey            |
|                                      | D. Husband         |
|                                      | B. McLennan        |
|                                      | R. Audas           |
| Chief Draftsman                      | M. Whish-Wilson    |
| Superintendent of Mapping            | J. Cavill          |
| Chief Geodetic Surveyor              | J. Van As          |
| Chief Photogrammetrist               | K. McDonaIs        |
| Chief Cartographer                   | L. Callanan        |
| Town Planner                         |                    |

It is intended that information be made at other Departments, Commissions, Councils etc. and the Public on the availability of maps and associated information. This has been delayed due to availability of staff. I will certainly ask that such information be published in your journal as I consider it the best means of communication within the profession.

Yours faithfully,

C.W. SPARKES-CARROLL  
A/Surveyor General.



PNG University of Technology,  
P.O. Box 793,  
LAE.

25th April, 1974.

Dear Sir,

We, the final year surveying students, wish to attend this year's Survey Congress. We have investigated normal air fares and also charter rates to Bougainville but the expense is well beyond the grasp of all of us. The students are planning to hold some fund raising ventures and we would also like to hear some suggestions from the members of the Association to make the trip possible.

Our aims for wanting to go to Bougainville are set out below:

1. Attend Survey Congress.
  - (a) Listen to speakers at the technical sessions.
  - (b) Exchange of ideas with fellow surveyors.
  - (c) Exchange of points of view regarding Surveying profession's contribution to the best situation of PNG.
  - (d) Discussion with previous graduates, the obstacles they encountered and their experiences.
  - (e) Viewing of exhibitions to evaluate the latest equipment on the market - e.d.m., programmable calculators and other accessories.
  - (f) Increase in personal status from the point of meeting better job prospects (wheeling and dealing).
2. A visit to Panguna.
  - (a) Mine Surveying - the duties of the surveyor in a mining project.
    - (i) Topographic control for mapping.
    - (ii) Layout of works - roads, buildings and other engineering works.
    - (iii) Survey work for the determination of volumes of ore (pay dirt).
    - (iv) Any photogrammetric operation?

- (b) How does a large company like Bougainville operate from the point of view of:
  - (i) Initial financial outlay for investigation, how investigation is carried out?
  - (ii) The mining techniques.
  - (iii) The treatment of the ore to obtain a marketable commodity.
  - (iv) How the final product is marketed, who buys it, how are prices arranged and so on.
  - (v) The economics of the company - costs, profits, and benefits to PNG.
  - (vi) The detrimental side of large mining projects to the country.

This knowledge is beneficial as extra knowledge for the professional man, but most important to realise how companies operate so that in future if one does set up his private firm, he can appreciate the situation - probably in a smaller scale.

3. The final year students will be able to visit the High Schools for the purpose of PR for the Surveying Profession and to give information to students for careers in Surveying.

4. A visit to the Regional Office (D.L.S. & M.) to hear of government surveying on Bougainville and so on.

Any suggestions to assist the students in making it possible to go to Bougainville will be greatly appreciated. All documents should be addressed to A. McCarthy, the secretary of the Association.

Yours sincerely,

Lionel PAISAWA.

(on behalf of final year  
Surveying Students)



97 Shortland St.,  
AUCKLAND 1.

From the Office  
of  
The Chairman—Coordinator  
Pan Pacific Congress of Real Estate Appraisers, Valuers  
and Counselors

25th February, 1974.

The Association of Surveyors of Papua New Guinea,  
P.O. Box 793,  
Lae,  
Papua New Guinea.

Dear Sir,

This is to advise you that the 8th Pan Pacific Congress of Real Estate Appraisers, Valuers and Counselors will be held in Rotorua, New Zealand from the 14th to the 18th April, 1975.

For your information Rotorua is 150 miles by road south of Auckland. It has its own airport and many natural scenic attractions.

I would be obliged if you would advise your members of the dates and venue as soon as possible.

Within the next two months more detailed information will be made available and your members will at that time be asked to indicate the likelihood of their attendance.

Yours sincerely,

R.S. GARDNER.  
CHAIRMAN—COORDINATOR.

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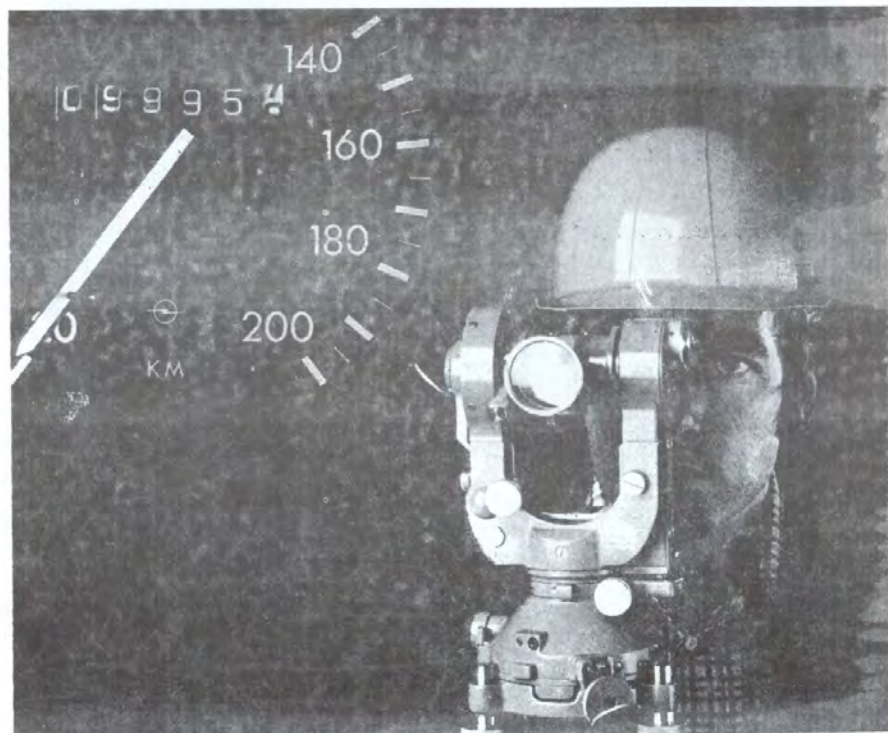


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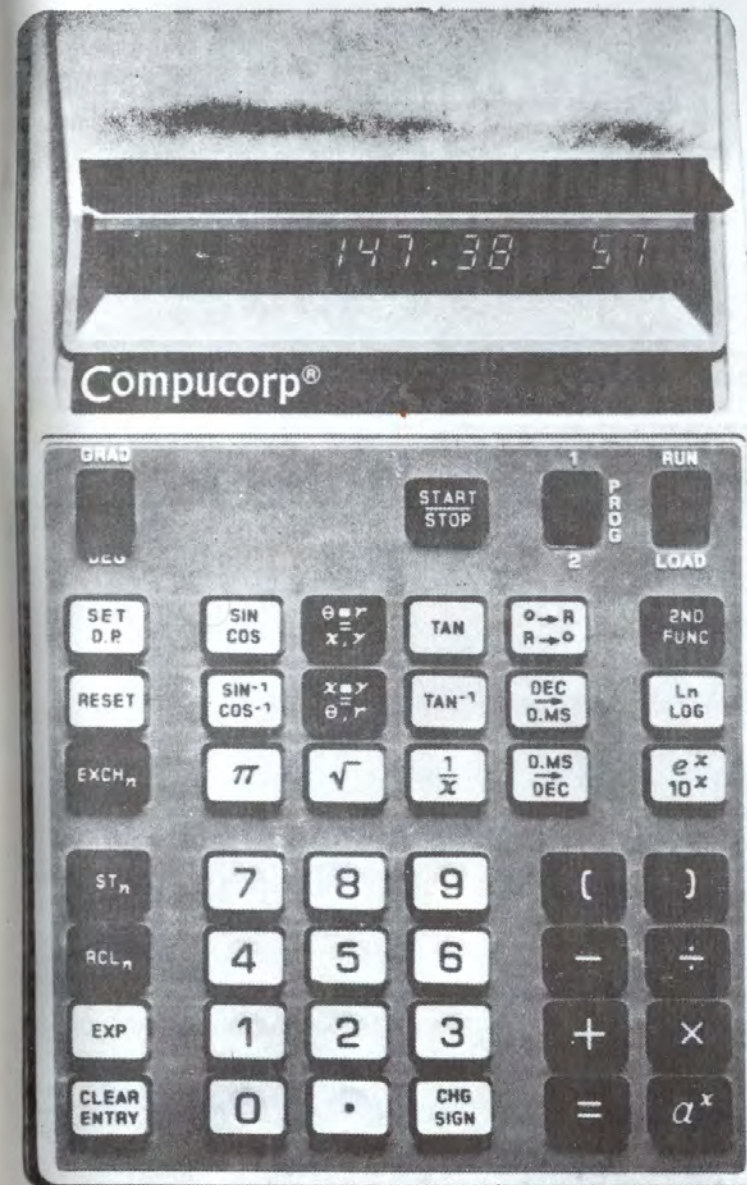
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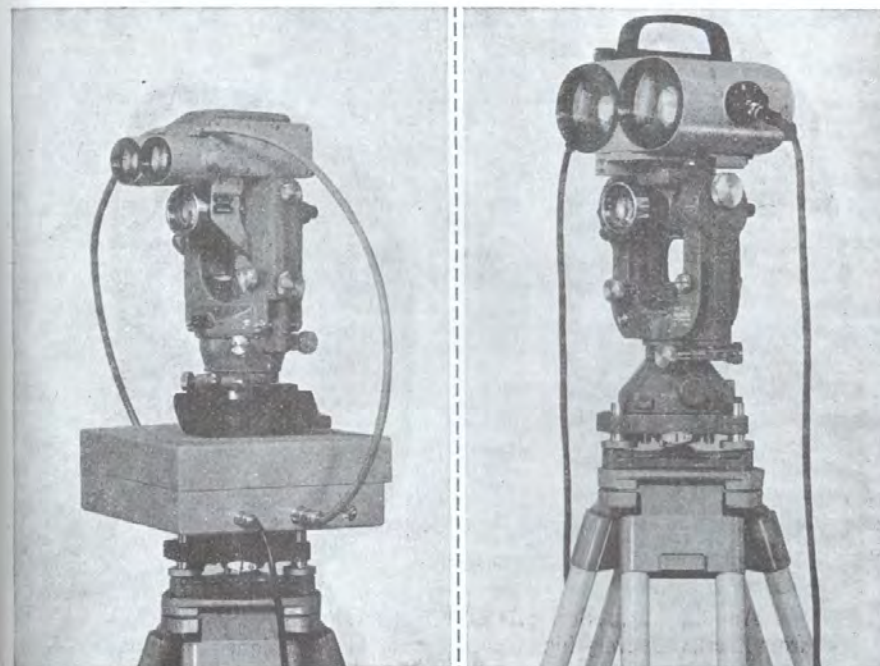
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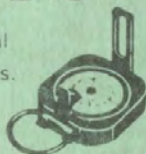


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