EXTRACTS FROM PAPER

“THE STORY OF THE ROYAL AUSTRALIAN SURVEY CORPS “

by

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GENESIS OF THE AUSTRALIAN SURVEY CORPS.

Following on the Federation of the Australian Colonies in 1901, the Parliament of the Commonwealth passed the "Defence Act" 1903 et seq. Sections 30 and 31 of this Act provided that the Defence Forces shall consist of two branches called the Permanent Forces and the Citizen Forces. The Permanent Forces raised in peace were to be restricted to certain specified arms and services in which "Survey" was included. It was further provided that "There shall be an Australian Intelligence Corps which shall constitute a Corps of the Citizen Forces."

In 1907 the Governor General approved the Establishment of the Australian Intelligence Corps, and one of its defined tasks was the preparation of strategic and tactical maps and plans. The O.C. of the Corps was Colonel Mc Cay and under his direction a start was made on the formidable task of military mapping. The personnel concerned with this work were few in numbers, available only for brief periods of normal militia service, and not specifically trained in this technical activity. The technique of mapping was to use available Parish or Hundred Plans of the State Lands Departments and with this pattern of cadastral boundaries as the basic control, the mappers would add cultural features, timber delineation and contours.

After about a year of working on these lines, the inability of a part time and untrained organization to cope with the task became very apparent. The Australian General Staff accordingly sought the advice of General Close, the Chief of the Geographical Section of the General Staff of the British War Office. As a result of this advice, the Australian General Staff decided that mapping would be a responsibility of tree Permanent military forces rather than of the Citizen Forces, and the unit to be raised to do this work was to be the "Survey Section, Royal Australian Engineers", which was allotted for duty under the control of the Australian Intelligence Corps.

The first appointment to the newly established Section was Lieutenant J.J. Raisbeck, 9th Australian Light Horse, and C.M.F., who on 16th April 1910 was appointed Warrant Officer, Draughtsman, with the honorary rank of Lieutenant. He was joined soon after by another Warrant Officer Draughtsman named Constable.

In the meantime arrangements had proceeded for the procurement of Royal Engineers from Great Britain for a loan period of two years. These arrived in Melbourne on 11th April, 1910. They were Corporal Lynch and Sappers Davies, Wilcox and Barrett. On 1st July 1910, William Lawrence Whitham, an Australian Licensed Surveyor, was gazetted Lieutenant and would normally have exercised command of the Survey Section. He however was seconded for training and his appointment to the Survey Section was little more than nominal. He resigned his commission in 1912 and went back to private practice as a Licensed Surveyor in Adelaide. His place was filled by the appointment on 17th March 1913 of Lieutenant Quinlan who in civil life had been employed on Colonial Surveys in Africa. In May 1912, Sappers Rossiter and Roseblade arrived in Australia, also on loan from the Royal Engineers. During June, July and August of that same year, six topographers and two draughtsmen were enlisted locally. The topographers were Sappers Clews, Radcliffe, Murray, Clements, Anderson and Blaikie. The draughtsmen were Warrant Officers Macdonald and Mollross.

The mapping programme was dictated by the need to provide maps of the military training areas, and sub sections were based on Sydney and Melbourne initially and subsequently on Adelaide in 1913 and on Perth in 1915/1916. By August 1913, an area of 3600 square miles had been mapped to the field sheet stage. The field survey technique was based on the plane table using local cadastral' control, the inherent errors of which proved unacceptable and led to the introduction in 1914 of a triangulation system of survey. The theodolites used were Troughton and Simms 5 inch micrometers which were adequate for the purpose as third order accuracy was then the objective.

There was a further increase in the establishment in 1914 with the enlistment of Sergeants Bradley, Watson, Roberts, Shiels, Jones and Simms. In July 1915, T.A. Vance, a Licensed Surveyor, was appointed with the commissioned rank of Lieutenant. Captain Quinlan resigned in 1915 and was succeeded by Lieutenant Lynch who remained the senior officer of the Survey until his retirement with the rank of Major in 1934 after 24 years of conspicuous service.

An Order-in-Council dated June 1915, ordained that :

> *"1. A Corps to be called the Survey Corps shall be raised as a unit of the Permanent Military Forces.*
>
> *2. All Officers, W.O.s, N.C.O.s, and men now serving with the Survey Section of the Royal Australian Engineers shall be transferred to the Survey Corps with their present ranks."*

FIRST WORLD WAR.

Of the 3 Officers and 17 other ranks who constituted the Survey Corps in 1915, 3 Officers and 12 other ranks enlisted in the A.I.F. and saw service in France and Belgium, or in Egypt and Palestine.

As part of the Australian Corps, a Corps Topographical Section was responsible for all tactical maps needed by the Australian Divisions. These maps were based on the 1/20,000 French series supplemented and amended from air photos taken by the Australian Flying Corps Squadrons. Other members were employed under G.H.Q. control on triangulation surveys preparatory to further retirement after the German attack in the spring of 1918. Three members served in Sinai and Palestine, one of whom - Murray - was awarded the Distinguished Conduct Medal.

Survey operations in the First World War were significant not so much for the part played by the Aust. Survey Corps personnel but for the evolution of the military survey organization within the British Forces, and for the lessons learnt. Starting with no survey forces in the field, there evolved the Sections, Companies and Battalions. The Survey staff initially comprised at G.H.Q. level, a Topographical Sub-Section of the General Staff, known officially as I(c), but more commonly as "Maps, G.H.Q.," and consisting of a Captain and one clerk. This subsequently expanded to 9 officers and 50 other ranks, one significant appointment being an officer in charge of "Geodesy". The lesson that had been learnt the hard way was that the study of the geodetic problems should proceed in peace time for all potential theatres of operation.

PERIOD 1919 TO 1933.

On the return of the A.I.F. to Australia in 1919, the Survey Corps again became available for surveys on the home front but the general unsettled conditions then prevailing led to the retirement of some on retrenchment or in search of civil occupation. There was some re-enlistment and new enlistment to replenish deficiencies. The writer of this paper joined the Corps in 1923 with the rank of Corporal, the establishment then being 14 all ranks. There were practically no changes in the establishment nor in the appointments for the next ten years apart from normal increments in rank and pay.

This was the era of the plane table and the development of the, expert topographer. The dependence upon the Parish Map was past and triangulation control was the rule without exception. The production output of the Section was impressive. In the period 1921 to 1928, 9750 square miles were mapped for production at the final scale of one mile to one inch.

The possibilities of applying air photography to mapping had been visualized during the First World War and had been applied in an elementary way to supplement trench detail on the existing maps. In 1924 an area around Western Port Bay in Victoria and one around Wiseman's Ferry in N.S.W. were flown by R.A.A.F. for experimental mapping, but straight line and level flying had not then been perfected and the photos were too tilted to even lend themselves to the production of an acceptable mosaic.

The British War Office was aware of the significance of this new tool of the surveyor and the need to apply it to the best advantage. It accordingly created an Air Survey Committee under which notable work was done by Lieutenant M. Hotine R.E. It was the publication of Hotine's "Simple Methods of Surveying from Air Photographs" which had a profound influence throughout the British Commonwealth and the Australian Survey Corps did not lag in applying it. A committee report dated June 1927 led to the raising of a R.A.A.F. Survey Flight and by the end of 1930 the map sheets of Nowra, Kiama, Moss Vale, Albury, Mittagong, Saint Albans, Wallera-wang, in N.S.W., Dugandan, Caboolture, Springbook, Tweed Heads and Warwich in Qld., and Melbourne and Yen Yean in Victoria, were photographed.

Yap production from this R.A.A.F. photography proceeded through several stages of technical evolution and development. The Wapiti's limitation of ceiling and performance led to the acceptance of a flying height of 12000 feet - too low for best economical production with the then available equipment and "know how". Prior to 1930, the photos were perforce used in conjunction with planetabling in the field. A breakthrough was made on the mapping of the Albury Sheet when graphical methods of perspective rectification were applied with a marked increase in speed of compilation and a big reduction in cost.

The survey of the Albury sheet also brought to a head the problem of reconciling two entirely different triangulation systems - those of N.S.W. and Victoria, with-their separate origins of geographical coordinates, different standards of accuracy, and different Figures of the Earth for computational reductions. These two surveys were connected by observing a quadrilateral comprising stations Howlong and Loka on the N.S.W. side with Lady Franklin and Talgarno on the Victorian side. This survey disclosed a difference of 8 seconds in azimuth, 1 in 32000 in line length, 1 second of arc in latitude and 9 seconds in longitude. This state of affairs was unacceptable and led to an immediate decision to adopt the Sydney Observatory as the datum for geographical coordinates for Australia; to convert the N.S.W. values for the Clarke 1858 Figure ; and to improve existing surveys by reobservation or recomputation ; and to measure a base line in the vicinity of Mount Gambier in S.A.

A Report dated Nov. 1931, quotes a figure of 60 map sheets or about 30000 square miles having been surveyed with triangulation control, mapped and published at the scale of one mile to one inch. In addition to facing up to the problems of geodesy and photogrammetry, in the fields of general cartography the Survey Corps had resolved effectively the deciderata of scales, conventional signs, graticules, grids, sheet lines and format. Fair drawing had attained en exceptionally high standard and although the Corps did not at that time possess full lithographic equipment it supervised and controlled map reproduction by the Victorian State Government

Printer and the finished product was widely acclaimed as an excellent example of mapping.

PERIOD 1932 TO 1939.

The need to accelerate map production was obvious and could not be denied. The Corps and the General Staff lost no opportunity in advocating expansion but it needed more than a worthy cause to break through in the depression period of the early thirties. The only increment prior to this time was the appointment of Warrant Officers H.C. Raisbeck and W.M. Sarll, both expert draughtsmen. In 1935 authority was granted for an increment of ten. These included Warrant Officer Draughtsmen Westgarth, Stewart, and Tyler, and 6 topographers, all Licensed Surveyors, Warrant Officers Rimington, Kurrle, Johnson, Macdonald, Eggeling, and Reif; and

Sergeant Carter. This intake was to play a very significant role in the years to follow. A further plan of expansion occurred in 1938 following the adoption of a Long Range Mapping Programme to meet the

Defence needs as then foreseen. To give effect to this programme, approval was given for an increase progressively over a three year period to reach a total strength in 1940/1941 of 15 officers and 82 other ranks. The 1938/9 intake produced 25 other ranks of which Warrant Officers Lockwood, Hanley, Herridge and Townshend were Licensed Surveyors. The proposals for further expansion were suspended in 1939/40 and gave way to a war organization which was to reach far greater ceilings and ramifications.

The application of photogrammetry tended to become more standardised with improvements in technique, experience and equipment. In 1936 the R.A.A.F. Survey Flight adopted the Eagle 4 Camera. This gave some improvement in the Quality and effective size of prints and the Survey Corps was able to apply the "Master Grid" block compilation method of mapping.

Geodetic survey proceeded actively throughout this period. The proposed base line in the vicinity of Mount Gambier was in fact selected at Millitentk in S.A. and measured in 1934 using invar bands standardized against the floor standard of the N.S.W. Lands Department. Some doubts about the value of this standard and the Coefficient of linear expansion of the invar tapes led to tests carried out with the ready and capable help of Professor Kerr Grant, Professor of Physics at the Adelaide University. This led to the introduction of a practical field method for determining the length of field standards using the temperature coefficient of electrical resistance in lieu of the unreliable mercurial thermometers. This technique was a significant development and without doubt brought the Survey Corps measurements of base lines to the forefront of world practice. Another base line was measured at Tarlee in S.A. in 1934 and a first order chain of triangulation of 300 miles connecting the two bases was observed. The theodolite used was a C.T. & S. 8 inch with three micrometers and the standards of the U.S. Coast and Geodetic Survey were adopted. Heliographs and lamps were used on beacons and least square adjustments were applied on computations. Astronomical observations were made for latitude, longitude and azimuth, using electrical contact chronometers and chronograph, and radio time signals. The National Observatory at Canberra introduced rhythmic time signals for this purpose. These were subsequently abandoned for field reception when Station WWV became more readily available.

The pressure of geodetic work led to the raising of a special Geodetic Section which measured in turn, base lines at Jondaryan in Qld, at Somerton in N.S.W., and at Benambra in Vic. Triangulation connecting these bases extending from Queensland to South Australia was completed and computed, a very creditable performance for a relatively small Section.

Concurrently with the geodetic survey, the topographical sections proceeded with minor triangulation and mapping, the pressure for which mounted as 1939 drew nearer.

PREPARATION FOR WAR.

A normal responsibility of Army Headquarters in peace is to prepare "Instructions for War" applicable to each separate Corps organization. "Instructions for War - Survey" were compiled and promulgated in July 1939. The defined object of these instructions was "... to provide a basis for the formation of a field organization, suited to Australian conditions and capable of fulfilling the following functions :-

(1) To undertake an emergency mapping programme, and at the same time,

(2) To form a nucleus for expansion to war establishment."

Provision was also made for the appointment of State Survey Liaison Officers (S.S.L.O.) who in practice were the State Surveyors General or senior Staff Officers of the Lands Departments. The S.S.L.O. was directly responsible in matters of liaison to the Deputy Director of Survey of the Headquarters of the respective military command in his state.

The military side of the survey organization was to include a Survey Directorate on A.H.Q., a Cartographic Coy., a special A.H.Q. Svy Sec, a Svy Coy in each of Northern, Eastern, Southern and Western Commands, and a Svy Sec in 7 M.D. (Darwin). These units were to be raised with elements of the regular Survey Corps

and from recruits from lists maintained by the S.S.L.O. who in this respect filled the role of a manpower officer. Recruits were to be trained at survey depots or by direct absorption in units. This planning in conformity with higher policy was directed to operations solely in Australia and made no provision for a force to be despatched overseas.

The official conception of Australian Defence at that time was based on the principals defined at Imperial Conferences. This in substance meant participation in Empire naval defence and a local defence against invasion and raids. The three year plan of expansion from 1935 to 1938 provided barely enough funds to recover some of the substance the Army had lost during the depression period of the early thirties. Events then moved ominously in Europe and the Australian Government of the day allotted more funds coupled with some feverish campaigning for an expanded militia. There was no provision in the Militia organization for raising survey units in peace.

SECOND WORLD WAR.

It was to be twelve months to the day after the declaration of war that War Cabinet approved of an expansion of the Survey Corps broadly on the lines outlined above. Provision was also made for the organization of civilian survey and compilation sections for the urgent production of Emergency Maps at the scale of 1 mile to 1 inch as an interim measure while the newly raised Field Survey Companies were being trained in the production of the Standard Series. The emergency edition was not to be contoured. The civilian sections were to be raised within the State Lands and Survey Departments.

Previously in February 1940 it had been decided to embark on the "Strategic Mapping Scheme". This had for its objective the production of a 4 mile to 1 inch series covering the coastal strips TOWNSVILLE - PORT AUGUSTA to a depth of 200 miles inland; ALBANY - GERALDTON to 100 miles inland and certain strategic areas around DARWIN and parts of TASMANIA. The first edition of this series was in fact little more than a recompilation of the cadastral pattern with road classification. It did however establish graticules and sheet lines which in due course became substantially adopted as the national series. The second editions which followed for the more significant areas were much better but the whole series remained during the war period sub-standard and were rightly regarded as emergency productions and to be used as such.

War Cabinet's decision in February 1940 to raise an Australian Corps, A.I.F. opened the way to raising a Survey Company for overseas service. This was 2/1 Corps Field Survey Coy. A.I.F. This unit of 147 all ranks comprised field survey, drawing and lithographic sections. After a training period at Puckapunyal, it embarked for the Middle East on 5th February 1941. It saw service in Palestine, Syria, and Transjordan. Its last field task before returning to Australia in March 1942 was the mapping of an area on the Turkish - Syrian border. This year of operational experience proved invaluable for the period ahead in the Pacific theatre. The Australians proved themselves well able to handle the mapping problems confronting them although there were still serious deficiencies in air photography and equipment. The technique of Position Line Astro Fixes as developed by the British Survey Units in the Western Desert was one which was to be applied both in war and peace by the Australian Survey Corps.

On the declaration of war with Japan and the consequent mounting and quickening of the threat to Australian territory, the mapping needs became extremely urgent. An immediate outcome was a close liaison with the survey staff of the Office of the Chief Engineer, on General MacArthur's G.H.Q., - an association which was to prove of great mutual advantage for the duration of the war and later into the post war period.

The planned organization referred to above gave way to a revised one amounting in substance to the following :

Survey Directorate at Land Headquarters (LHQ)

LHQ Cartographic Coy.

Four Field Survey Companies.

Two Army Topographical Survey Companies

Three Field Survey Depots.

One Mobile Lithographic Section.

Recruiting into the Survey Corps in the first year was reasonably satisfying, being able to tap the pool of trained or semi-trained surveyors and draughtsmen in civil life. This source of supply soon dried up however and it became necessary in 1942 to establish a Field Survey Training Depot where raw recruits were given initial training before being posted to Field Units.

Equipment was procured from every available source. Great Britain supplied much of the field survey instruments. This was supplemented by local procurement and some local manufacture.

The major items of lithographic equipment came from local resources, sometimes under impressment. These lithographic items amounted to :

15 rotary offset printing presses

7 process cameras

7 printing trailers

4 camera trailers

4 dark room trailers

The Order of Battle (O.O.B.) of Survey Units amounted to about 1700 all ranks and the complete turn over in personnel probably amounted to over 5000. At the cessation of hostilities in August 1945, the units then posted overseas were :

FORMATIONS	**SURVEY UNITS UNDER COMMAND**
ADV LHQ	Det 2/1 Army Topographical Svy Coy
	12 Field Survey Depot
	1 Mobile Lithographical Section
FIRST AUST ARMY	6 Army Topographical Svy Coy
	Det 2 Field Survey Company
1 AUST CORPS	2/1 Army Topo Svy Coy (less Det)
	5 Field Svy Company (less Dets.)
7 AUST DIV	Det 5 Field Svy Coy
9 AUST DIV	Det 5 Field Svy Coy
2 AUST CORPS	Det 2 Field Svy Coy

Total Survey Force Overseas : 862 all ranks

The situation with regard to the maps produced by the end of the war was as follows :

Maps Published by Australian Survey Corps

Location	8 miles to 1 inch	4 miles to 1 inch	1 mile to 1 inch	1:25000 & 1:20000	Total
Australian Mainland	62	224	397	25	708
New Guinea & Adjacent Is.		33	118	93	244
Dutch New Guinea		2	6	8	16
New Britain		1	17	12	30
New Ireland		6			6
Bougainville & Green Is.		2	24	42	68

Borneo		25	83	39	147
Mindanao (Philippines)		44	156		200
TOTALS	62	337	801	219	1419

In addition to the above, there was a heavy commitment for Aeronautical Maps and Charts for the Allied Air Forces, and Tables for the Navy.

Statistics can be impressive and even interesting, but they do not convey the story of organization, the constant fight against time and deficiencies of equipment, the ever prevailing need for improvisation and development,- the problems of movement in operational areas, and the personal factors which mean so much to the individual and the unit. A short paper of this nature cannot do justice to men and events. It is hoped that such can be achieved in another place. A climax to the operational mapping of the Survey Corps was the production of the "Instrument of Surrender" documents for the signatures of the Australian and Japanese Commanders in the Field. That was the most gratifying of all tasks.

APRES LA GUERRE.

Although operational mapping halted with the cessation of hostilities, an urgent requirement still remained, and that was the production of maps of enemy occupied territory for the recovery of prisoners of war.

On the home front, a Commonwealth Department of Post War Reconstruction, (later to be known as the Department of National Development) was created. Many of its planned projects required urgent surveys and maps, and the obvious agency to do that work was the Survey Corps. This demand helped in the early movement of survey units back from overseas.

It was an unsettled period with little stability caused by the rush for demobilization. By the end of 1945, the Survey Corps strength had declined to 600 with a subsequent decline to 430 by mid-1947. This was the period of the Interim Army when continuity and conditions of service were most uncertain. A strong component of the members of the regular army served on and readily took control of the post war problems. The lessons of the war had been well absorbed and while a survey force was available there was plenty of work for it. At an early date, the General Staff approved a Long Range Mapping Programme and the Corps again swung into action on it.

Superimposed on this, were the tasks undertaken at the request of Federal and State Government Departments in connection with National priority projects. These included surveys in connection with the Nagoa - Comet River Lands, and sections of the Burdekin River for water conservation; surveys and mapping of the Kosciusko Area in connection with investigations concerning the diversion of the Snowy River and hydroelectric power; field surveys in the Northern Territory in conjunction with the C.S.I.R.; and an extraneous and an unwelcome task of preparing administrative maps for the 1947 Commonwealth Census.

The military long range programme referred to above, included about 2 million square miles of the mainland and New Guinea. The remaining area of the mainland consisted of remote and desert regions mostly in South and West Australia and not likely to have any significance in tactical considerations. Such regions however became significant to the British Ministry of Supply for the development of Long Range and Guided Missiles and surveys and maps for that purpose became the top priority for the Survey Corps. In 1946 the first ground reconnaissance was made for the range head and by air along the proposed range extending to the Ninety Mile Beach between Port Headland and Broome. Field surveys followed and included large and medium scale mapping extending out from the selected range head at Woomera; the measurement of a new base line at Koolymilka; the observation of a first order triangulation connecting the Carrington base near Port Augusta (measured, in 1941) to Koolymilka and on to Mount Eba; and long range reconnaissance along the line of range to the West Australian border.

PERIOD 1950 to 1960.

This was the decade of consolidation within the post war organization of the Regular Army. It was a period of significant development and progress but only the highlights can be included in the limited space of this paper and chronological order may not be maintained.

The close liaison with the U.S. Army Map Service which was established during the war was sustained and applied to cooperative projects in the post war period. One result was the survey and mapping of New Britain using joint resources of equipment and personnel. A complete perimeter traverse of over 800 miles was made using a unique method of survey developed by the Americans in other theatres. This was the "Ship - Shore" method of triangulation using simultaneous and synchronized observations from shore stations to a beacon on a ship at anchor off shore. Over 240 such stations were observed; 19 third order base lines were measured with astro fixes for latitude, longitude and azimuth. All sorts of transport were used for landing parties from the master vessel - LCMs, native canoes and rubber boats. A similar project was carried out for New Ireland. On that occasion, the Americans supplied logistic support in the way of ships and some equipment and the Australian Survey Corps supplied all technical personnel.

The year 1956 is significant in that it heralded two major introductions into Australian military mapping. One was the decision of the Army authorities to switch over to the decimal scales of 1:50000 and 1:250000 in lieu of the 1 Mile and 4 Miles to 1 Inch of the British Scale series. The other was to adopt scribing as a technique to be applied without delay in lieu of the conventional draughting methods of pen and ink. The first sample equipment including scribing pens and "Astrascribe" was procured in 1955 and after some intensive testing and further procurement, the "Mildura" 1:50000 sheet was produced. That sheet was again significant in that it also embodied a new series of conventional signs in conformity with agreements on an international military level.

The introduction of electronic measuring devices proved as revolutionary in the field of surveying as was the air photograph. In 1957, the Survey Corps procured a "Geodimeter" and soon afterwards the initial three "Tellurometers" of an order for ten. These were subjected to intensive trials to determine their dependability and application. The Tellurometer was selected as the instrument to be adopted for geodetic work. During the short field season in 1958 in Northern Australia, the following Tellurometer traverses of first order accuracy were carried out :

Charters Towers - Tennant Creek	1023 miles
Jondaryan - Rockhampton	408 miles
Rockhampton - Charters Towers	437 miles
Halls Creek - Wyndham	570 miles
Total	2438 miles

On these traverses 133 stations were occupied and observed to first order standards of accuracy.

The following season similar traverses were carried out as follows :

Townsville - Coen	300 miles
Halls Creek - Stuart Highway - Roper River	818 miles
Wyndham - Kalumburu - Mt. Synnot	660 miles
Total	1778 miles

These traverses amply demonstrated that the era of conventional triangulation was past and that the potentiality of this new electronic tool of the surveyor put an entirely new concept on the problems of Australian geodesy.

A factor which contributed to the exceptional progress of the above traverses and the associated 'mapping was the use of light aircraft in support. Light fixed wing aircraft and helicopters were used extensively and proved of utmost value and in many cases quite indispensable. Navy ship support along the Arnhem Land

coast was also used.

At the end of this decade, the Survey Corps had passed through some stages of reorganization and had achieved an Establishment designed for efficient and strategic operations. Its total force amounted to 44 officers and 342 other ranks. Its main unit was the AHQ Survey Regiment of 200 all ranks located at Bendigo in Victoria. This unit was responsible for all fair drawing and lithographic reproduction. It included a survey squadron for special activities and for photogrammetric compilation. In each of Northern, Eastern, Central and Western Military Commands there was a Field Survey Section equipped and trained in field surveys and map compilation. There was a Survey Depot in Melbourne responsible for tap storage and distribution, and at Balcombe in Victoria was the School of Military Survey. Directing the operations and organization of this force was the Director of Survey and his staff on Army Headquarters.

ALIGNMENT FOR NATIONAL MAPPING.

This matter of co-ordination raised issues which have proved most difficult to resolve. The Australian States are autonomous with regard to their own requirements for surveys and mapping for State purposes. This function was not taken from them under the Federal Constitution. The Royal Australian Survey Corps derived its responsibility for military mapping from the Defence Act. The Commonwealth Departments of the Interior and of National Development have certain responsibilities for surveys and mapping of Commonwealth Territories.

The Surveying resources of the States at least until 1940 were chiefly occupied with surveys for land title and settlement and had not undertaken any systematic mapping. It would not be unreal to assess the topographical mapping carried out by all civilian agencies, both State and Federal, up to the beginning of the Second World War in 1939, as amounting in total to no more than the equivalent to one sheet area of the 1 mile to 1 inch series.

At the conclusion of the war in 1945, the development of State mapping organizations proceeded apace and no doubt was given impetus by their younger staff officers who had acquired training and experience during their war service, and who clearly recognized the erstwhile deficiencies of their State Departments in this respect. A similar impetus occurred in the Federal Department of the Interior leading to the creation of a National Mapping Branch later to function under the Department of National Development.

The following statistics are indicative of this growth and provide some idea of the potential which had been developed by 1953.

Personnel and major items of Equipments - 1953

Department	Personnel	Major equipments - £ value	
		Photogrammetric	Lithographic
Army	296	56000	133000
Interior	83	17000	3500
Victoria	75	74000	3500
New South Wales	40	76000	Nil
Queensland	23	32000	2000
South Australia	35	73000	Nil
West Australia	47	7000	6500
Tasmania	20	12500	Nil
Totals	619	£347500	£148500

The personnel figures above, include those engaged on the administrative and other tasks not directly associated with the production line of basic topographical mapping and in most cases the figures could be approximately halved.

A commonwealth Survey Committee had been set up in 1935 but it achieved little until reconstituted in 1947. It was an Advisory Committee with representatives of the Services and civil Commonwealth Departments associated with mapping in a production or user capacity. In 1945 the National Mapping Council was constituted with the Commonwealth Surveyor General as Chairman, a representative of the Commonwealth Survey Committee (Director of Military Survey), and the six State Surveyors General as members. One of its functions was and is to co-ordinate and correlate mapping on a national basis.

These post war developments were quite justified and in fact most belated but could get out of hand if not subjected to joint planning. The matter of the proper utilization of resources and of standardization of techniques and of the end products required something in the nature of a master plan. The Federal Government, on Army representations, procured the services of Major General R.L1. Brown, then Director General of the Ordnance Survey of Great Britain, to advise on the major issues of Military and National Mapping. General Brown submitted his report dated Dec. 1951. It was a brilliant report and should have resulted in a solution acceptable to all responsible parties and in the best interests of National Mapping. It was considered by a Federal inter-departmental Committee in the initial stages of investigation only and in due course a submission was made to Cabinet allegedly in accordance with the recommendations of the "Brown" report. In truth, the Cabinet Decision (1954) on National Mapping is so far divorced from the Report that the circumstances of the submission are more than suspect.

One clause of the Decision took away from Army its inherent rights and responsibilities for military surveys and mapping. Another clause disbanded the Commonwealth Survey Committee and created in its stead a standing Advisory Committee of which the only technical member is a nominee of the Institution of Surveyors, Australia. This was an extraordinary decision. It was certainly not based on any recommendation of the "Brown" report or any other responsible authority. This Advisory Committee is constitutionally incompetent and it is not surprising that the outcome of the Cabinet Decision has failed to achieve the proper utilization and co-ordination of resources. In view of the fact that as stated above, the only technical member of the Advisory Committee is the nominee of the Institution of Surveyors, that Institution cannot be resolved from responsibility in this matter. Article 11 of the "Code of Ethics" requires of each and every member that "He shall corporately accept a responsibility to the Governments of the day and to the general public for advice and assistance in matters of national welfare and appropriate to the professional interests of his Institution".