

INSTITUTION OF ENGINEERS AUSTRALIA  
SYDNEY DIVISION ENGINEERING HERITAGE COMMITTEE  
ORAL HISTORY PROJECT

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TAPE 1, SIDE A

Counter	Subject Matter
000	Born 10 <sup>th</sup> December 1913 in Lismore. At seven moved to Cammeray Sydney. Father was raised In the country and had private tutors . Mother Agnes Hermann had German ancestry, came from a town near Stuttgart.
048	Genealogy - has traced his German ancestors back to the mid 14 th century. Studied German at high school and was able to help a cousin with the translation of family history
073	From age 12 wanted to be an engineer, originally wanted to be a marine engineer on a liner. Knew that SYDNEY TECHNICAL HIGH was the school to attend if you wanted to be an engineer. It was selective and F. A won a place. The school has produced many fine engineers. I t was at Paddington, near Victoria Barracks. Now at Hurstville. F.A is researching history of the School an visited recently. He was Dux in 1930.
130	By the time he left school, wanted to be a civil engineer. Went to Sydney University on an exhibition which paid most fees. Also won a bursary paying £1 per week
145	After 1 <sup>st</sup> and 2 <sup>nd</sup> year engineering did science, graduating in 1934. During last year of science worked as a demonstrator to first year physics and coached in Maths and Physics. Particularly interested in structures and surveying. Also astronomy which was a strong part of the course connected to navigation.
168	Uni year book for final year mentions this interest in astronomy. Still interested and has made own telescope
190	At the end of third year engineering in 1934 worked for the Dept. of Main Roads August 34 to February 35. Labour intensive work at the end of the Depression.
203	Worked on a diversion of the Pacific Highway over the Burringbar Range. Primitive construction methods, most workers were on relief work. Hand held ploughs and bullock teams were used and then hand - held scoops pulled by draught horses to move the soil.  Construction workers' camp was on a farm. The powder monkey went to Brisbane one weekend and came back with a "wife" with whom he set up a canteen.
245	F.A. boarded in a nice home in Burringbar with the Engineer in charge and clerical staff. Met his wife in that home. They were married three years later in 1937.
258	Graduated in Engineering in 1936 with 2 <sup>nd</sup> class honours. F.A. produced the 1935 Civil Engineering Yearbook which included photos of graduates and comments by fellow



students. He read his entry onto the tape

292 Almost killed on the North Coast during a bareback ride at night. The horse was a charger from the Light Horse and wouldn't pull up. Was kicked in the head and spent a week in hospital.

308 After graduating worked for the Water Board in the drawing office as a design draftsman .

During the Depression there had been little construction work and the sewerage and water supply system required work. 1935/6 lots of technical staff employed. Included many of F.A.'s final year colleagues - Rowley Todd (became chief civil engineer for the Navy ) Howard Mansley and Alfred Dance ( later chief civil engineer, Public Works Dept.)

343 F.A. was given interesting design projects - aqueduct near Paramatta jail which is still functional ,storm water aqueduct at Blackwattle Bay ,sewer aqueduct at Lane Cove and 72 inch water main Prospect to Pipe Head.

358 Spent 1 year in design office then asked to move to construction where became supervising engineer. Worked on S. and W. suburbs ocean out fall a duplication of the main sewer which enters the sea at Malabar .

370 Construction of sewer tunnel through Botany area involved open cut in some very deep sand - trench was up to 30 feet deep in places. Some portions of the tunnel were above ground, most about 15 feet under .

390 Commenced excavation with a large grab, large timbers were placed across the trench and were about 15 inches deep. Spreaders and longitudinal timbers were placed first and then timber sheeting (whalings) were driven in behind.

#### SIDE B, TAPE 1

433 Whalings went down in sets one inside the other with straw in between to prevent infiltration of sand . Pumps operated continuously because of water problem with spears into trench. It was possible to keep it completely dry .

450 Sewer was re-enforced concrete twin sewer, each conduit 6'6" high and 9'5½" wide.

465 Concrete was done in several stages in sand trench. Re-enforced concrete piles had head stocks on top and then a rough concrete mat was poured on stocks about 6" thick providing a clean construction area.

477 3 stages for concrete pours -inverts were poured leaving re-enforcement projection ;form work was erected and walls poured to half height; final pour was remainder of walls and top slabs

F.A noted vertical cracking on the side walls within a week of removal of form work and concluded that shrinkage on new work on the invert caused tension on top of the new concrete and recommended extra re-enforcement at this position.

530 Cast in sections-50' construction lengths. F.A investigated a method of creating a seal between, sections. Tests at Hale St. Depot .Decided on a line of bitumen coated copper sheeting with a kink in it to allow for movement to be embedded in each section

At Hale St .Depot poured concrete for re-enforcement and pilings; designed form work

and a timber gantry to transport concrete piles

560 Supervised some concrete work, checked re-enforcement.

Difficult to obtain re-enforcement at the time- steel diverted to other things ?

590 By '38 had decided to change jobs. Had married in '37 and first child was born in '38. Holiday pay from the Water Board would meet hospital expenses

Took a position with City Council Surveyor's Dept. Spent 15 years with the Council - 1938 to 1953.

625 Oversaw building in the City of Sydney, initially examining plans from structural engineers for buildings. Checked C.S.R.'s sugar refining and hardboard manufacturing structures in Pyrmont also Manchester United building in the City.

644 The Building Surveyor was John Rankin, Chief Structural Engineer Roger Heard ; 5 structural engineers checked plans. City Architect and his staff were under the Building Surveyor.

662 Team of building inspectors who checked structural work had no special training; recruited from the trades, mostly carpenters. Needed training in the pouring of concrete. Welding came into vogue - F.A. went with the inspectors to do a welding course .

697 With a promotion came a change of activities was placed in charge of one of four districts into which the City was divided. In charge of area from George St. west to Pyrmont and Chippendale. Responsible for all construction work in that area and its compliance with Building Regs

When joined the Council in '38 a few building regs under the old City of Sydney Improvement Act , dealing mainly with thickness of walls to height were available. Relied mainly on Standards Association Rules

750 The 1932 Sydney Corporation Act provided for by-laws to be made and F.A. helped formulate these by-laws which eventually formed the basis for Local Govt. Ordinances 70 and 71.

770 Felt his area was "his patch" and got to know the leading architects and structural engineers in the City. Structural engineers Ledger and Crooks, McMillan and Briton. Ted Peacock discussed.

790 Did part time work for major firms of consulting engineers outside council hours.

Possible conflict of interest with work? Did structural design for a building on Broadway.

#### TAPE 2 SIDE A

031 Possible conflict of interest - told owners his name couldn't appear. Building still standing.

045 Height of Buildings Act limited the height of buildings in the City to 150'. Council couldn't independently approve over 100' height. Over that height required approval from the Chief Secretary's Dept. During F.A.'s time, few buildings over 100' were built. One exception the A.W.A building in York St.



- 105 By-law 54 referred to wind loading but no checks were ever done because wind had little effect on buildings up to 100'.
- 110 Plans for theatres and public halls had to be approved by the Chief Secretary's Dept.
- 140 Re-enforced concrete beams - Very little information was available on torsion in re-enforced concrete so F.A translated from the German a book on the subject by Professor Rauch. Did the drawings himself.
- 170 The Building Surveyor did a survey of all city buildings for egress in the case of FIRE ..Notices were served on owners where upgrading was required - aiming for enclosed stairwells with fire doors.
- There was great opposition from building owners. Sometimes nothing done; appeals procedures used as a delaying tactic
- 220 Building Surveyor also checked floor loadings. Relevant in F.A's area - warehouses with changing occupancies - one floor used for tile storage collapsed.
- 240 Greatest satisfaction in City Council job came from checking plans and seeing advances in structural design .Greatest frustration - checking minor architectural plans.
- 260 Outside Council work co-operated with H.J. Bye in designing a no. of re-enforced concrete buildings.
- 270 TEACHING CAREER In 1952 Marcus Gordon Bull resigned abruptly from Sydney University and F.A took his classes on a part-time basis. Liked the work and in 1953 applied for a position at the N.S.W. University of Technology which became the University of N.S.W. in 1958 .
- Concentrated on teaching structures - has taught every subject in the Structural Engineering course
- Text "Engineering Statics" written with Professor Hall is still in use.
- Taught post-graduate courses in structural engineering including for a 5 year period following formal retirement in 1970.
- 319 A considerable time was spent preparing lectures - up to 10 hours for a 1 hr. lecture. Continual updating of structural methods meant a continual learning process.
- 330 No previous teaching skills, but did a course - psychology of education.
- Over 22 years of teaching students and their attitudes didn't change much.
- 360 Did lots of research with staff and post-graduate students
- Many published papers - including some with Professor Hall - Collins Walsh Archer and Hall 'Re-enforced concrete beams subject to Torsion and Shear '

#### TAPE 2 SIDE B

Wrote a paper "statically Indeterminate Framed Structures of Non-linear Elastic Material " which broke new ground .

With Esca Kitchen analyzed and published papers on deep beams (span comparable to depth ).

- 461 WELDING. Felt that the simple methods in the by-laws and Standards Assoc. Rules were incorrect . Did testing with Kitchen and proposed a new design. Several papers including "Design of Fillet Welds for Static Loads" which was widely disseminated.
- 520 Project for a Master of Engineering student involved the use of pre-stressed cast iron as a material for bridge girders. F.A published a paper . Vice - Chancellor Baxter suggested further research - possible use as lining for power stations. Didn't proceed because was about to retire
- 530 Obtained most satisfaction out of teaching post-graduate students. It was frustrating to see students with ability who didn't succeed.
- High compressive strength of CAST IRON discussed.
- 556 With his wife fostered 48 children from about 1960 to 1980, mostly small babies for short periods, some for longer. Two have kept in touch.
- 603 Paints and sketches since retired ;has played lawn bowls for about 30 years. Up until 5 years ago ,used to drive up the coast to Queensland every year

#### NAMES MENTIONED :

Agnes Hermann  
 Howard Mansley  
 Alfred Dance  
 John Rankin  
 Roger Heard  
 Ted Peacock  
 Ledger and Crooks  
 McMillan and Briton  
 Professor Rauch  
 H.J. Bye  
 Marcus Gordon Bull  
 Professor Hall  
 Esca Kitchen