

# **AN EVOLVING ORDER**

**THE INSTITUTION OF  
PROFESSIONAL ENGINEERS  
NEW ZEALAND  
1914-2014**

**PETER COOKE**

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**PETER COOKE**

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# FOREWORD

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Thanks to the vision and ingenuity of our early engineers, New Zealand is furnished with the infrastructure and technology that enable the high standard of living we enjoy today. Shaping the land from the ground up, engineers facilitated the building of the young country's towns and cities, connecting them with road and rail networks, communications systems and other essential services. That legacy is all the more notable given the concurrent challenge of establishing the foundations for an engineering profession.

*An Evolving Order: The Institution of Professional Engineers New Zealand, 1914–2014* begins with engineers at a crossroads, grappling with their identity and status. The formation in 1914 of the national body now known as IPENZ marked the beginnings of our modern engineering profession. It offered a home-grown alternative to Britain's "parent" institutions, indicative of a New Zealand that was coming into its own.

More significantly, engineers were acting out of the necessity to assert both the professional pecking order and their place in society. The new body would provide them with direct representation and standard-setting, and successfully advocate for their registration, bringing about the evolution of a strong profession and the values and identity that grew with it. As the fields of engineering proliferated over the century, the New Zealand Society of Civil Engineers would need to branch out from its "civil" focus into other disciplines, undergoing two name changes to reflect wider representation.

This book charts the development of an institution and the profession it represents, along with the growth of a nation. As the country underwent momentous changes that would steer its future course, engineers were compelled to act, at times taking centre stage. They mobilised for two world wars, not only enlisting to fight but also providing technical expertise on the battlefield. Destructive earthquakes in Hawke's Bay and Canterbury required them to provide solutions but also tested their resolve, and – especially with the latter quake – public confidence in the profession. These events informed the professional body's thinking, as did changing societal attitudes on race relations, immigration, new technology,

## AN EVOLVING ORDER

environmentalism and gender. When issues were so contentious as to be divisive – such as with nuclear power – IPENZ facilitated open discussion amongst the membership.

Peter Cooke brings to life the centennial history through a plethora of sources, drawing on newspaper articles, historical journals, society bulletins, annual reports, academic texts and other archival material. Where possible, he lets engineers tell the story in their own words. The minutes of meetings illuminate engineering issues in the vernacular of the day, and interviews the author conducted with participants in the centennial story provide first-hand accounts of history. The combined effect is to convey an authenticity the book wouldn't otherwise have.

Times have changed considerably from a century ago, but *An Evolving Order* paints the picture of a professional body that never wavered from its founding principles. Then, as now, it was concerned – beyond its day-to-day membership functions – with status, ethics and public perception, with registration, competency and standards, and with serving the community to its fullest.

Cooke has masterfully weaved together an intricate body of knowledge to make sense of the people, issues and events of the past 100 years. This highly valuable resource is a superb way to mark the centenary year.

**Kevin Thompson**

*IPENZ President*

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## ABBREVIATIONS

(IN TEXT AND ENDNOTES)

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ACENZ	Association of Consulting Engineers New Zealand	ISE	Institution of Structural Engineers (United Kingdom)
ALGENZ	Association of Local Government Engineers of New Zealand	NZE	<i>New Zealand Engineering</i>
AR	<i>Annual Report/Annual Review</i>	NZIA	New Zealand Institute of Architects
EC	Executive Committee (of the Council)	NZICE	New Zealand Institute of County Engineers (later ALGENZ)
ED	<i>Engineering Dimension</i>	NZIE	New Zealand Institution of Engineers (1937–1982)
ERA	Engineers Registration Act	NZIS	New Zealand Institute of Surveyors
ERB	Engineers Registration Board	NZPD	<i>New Zealand Parliamentary Debates</i>
ESAEANZ	Electric Supply Authority Engineers' Association of New Zealand	NZSCE	New Zealand Society of Civil Engineers (1914–1937)
ICE	Institution of Civil Engineers (United Kingdom)	NZSI	New Zealand Standards Institute
IEA	Institution of Engineers Australia	PEANZ	Professional Engineers Association of New Zealand (1944–1959)
IEE	Institution of Electrical Engineers (United Kingdom)	<i>Procs</i>	<i>Proceedings</i>
ILGENZ	Institute of Local Government Engineers of New Zealand (1912–1914)	PWD	Public Works Department
IMechE	Institution of Mechanical Engineers (United Kingdom)	REA	Registered Engineering Associates
IPENZ	Institution of Professional Engineers New Zealand (1982–present)	SR	Secretary's Report
		TPE	<i>The Professional Engineer</i>

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# BEGINNINGS

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## THE ARRIVAL OF NEW ZEALAND'S SURVEYORS/ENGINEERS

New Zealand was one of the last parts of the temperate planet to be populated. After several hundred years of undisturbed occupation by Māori, it was re-colonised predominantly by technologically-advanced Europeans.

As a Neolithic culture, Māori relied on engineering to underpin their governing systems. The chiefly leadership role (*mana rangatira*) included certain obligations to protect and sustain the tribe. Engineering was vital in both defending people and their land assets, and over 7,000 *pā* (fortifications) were built.<sup>1</sup> Strong *pā* helped chiefs hold productive lands, which enabled them to command large labour forces and enhance the tribe's eminence. Settlers saw "an ingenuity...in arms and a skill in engineering which have won the admiration of our own generals".<sup>2</sup> The other engineering role was in hunting and food storage. Food was "the fundamental measure of wealth", so key to survival was the effectiveness of *waka* (canoes), fish traps, seine nets (which were several hundred metres long), roofed storage pits and above-ground *pataka* (larders).<sup>3</sup>

Settlers also saw riches in New Zealand, and the challenge accessing them was an engineer's dream. The arable lands needed draining, and roads and bridges built. Railways and ports would export the goods, after being processed in factories. Precious forests and minerals were there for extracting, and these industries imported many of the first loads of machinery. People migrating to New Zealand to till, harvest, mine and process needed to live, so settlements had to be built with streets and parks and buildings to house the social institutions that would spring up.

This was the vision of New Zealand's early colonisers, such as the New Zealand Company which started towns in Wellington, Nelson and New Plymouth, or the church-based associations that settled Canterbury and Otago. It was the practice too, with Bishop George

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*Mr Mantell at Moeraki [November 20 1848].*

Mantell, Walter Baldock Durrant 1820–1895: [Sketchbook, no. 2] 1848. Ref: E-333-084-3. Alexander Turnbull Library, Wellington, New Zealand.  
URL: <http://natlib.govt.nz/records/22802668>.

Augustus Selwyn (1809–1878) lamenting in 1851 that “Money enough has been spent but all on civil engineering...”<sup>4</sup> While the process of settlement changed Māori society irrevocably, it would also make a viable prosperous new country.

A Minister of Public Works, William Hall-Jones (1851–1936), saw inevitability in this development:

Our colony has so many natural advantages that to neglect so important a public [works] policy would be to place a great restriction upon the expansion of trade. The marked increase in the exports during recent years could not have been reached but for the improved means of internal communication. As the years go by this great work is being gradually accomplished, and I look forward to the time when, by the completion of the main lines of railway and of our road systems, together with the increased population induced by the settlement of the people upon the land, we shall reap to the full extent the benefits derived from the [public] work which has been and is being carried out.<sup>5</sup>

Development from 1870 to the 1890s was rapid, with much of the essential transport networks laid out, processing underway and agricultural exports generating great wealth. Legislation on water works opened the way to hydro-electric power which was to transform the country.<sup>6</sup> The Panama Canal, which opened in the same year as state hydro generated its first watt at Lake Coleridge, promised in 1914 to cut shipping times just as the Suez Canal had in 1869, increasing New Zealand’s returns from its sea-borne trade.

One of the earliest professions to be heavily involved in the colonisation project (after the imperial soldier) was surveying which brought mapping and boundaries to what otherwise appeared a seamless land. Covering 13 degrees of latitude north to south, New Zealand was 268,000 square kilometres (km) of land bounded by nearly 5,000km of coastline.

Each of the colony’s nine provincial councils established its own surveying and public works offices. At central government level in the 1860s and 1870s, surveyors became concentrated around the Lands Department (later Lands & Survey), whereas engineers later gravitated towards Public Works, Railways and Post and Telegraph. These departments focused on developing the national infrastructure of the country but fundamentally separated the two professions, which diverged in outlook. Upon the dissolution of the provincial councils in 1876, a surveyors’ board was established and it set standards for a surveyor’s qualification.

Surveying the purchased and confiscated lands (taken after the 1860s’ wars) was “indispensable to an intelligent administration” and gave surveyors such a head start that they formed their own professional association, the New Zealand Institute of Surveyors (NZIS), in 1888.<sup>7</sup> To gain entry, surveyors had to sit an examination and become licensed and gazetted. Surveying skills involved many of those also taught in engineering and many early surveyors were engineers.<sup>8</sup> Measurement, calculation and draughting are universal, and the NZIS therefore also represented engineers and even admitted engineering cadets as

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Associate members. Its formation was hoped to be an “outward sign of a long-desired unity among...Civil Engineer and Surveyor”.<sup>9</sup>

Local government became another big employer – the numerous roads, river, harbour and catchment boards, and borough, town and county councils. Many surveyors were competent at elementary engineering jobs, such as road formation and simple water or drainage works, and some also designed the buildings’ springing. The titles “City Surveyor” and “City Engineer” were synonymous in many towns, the same person providing these overlapping services (though not all surveyors felt they should be doing engineering work).<sup>10</sup> But the hoped-for harmony between these two professions proved elusive.

In a pure sense, the surveyor worked two-dimensionally whereas engineers worked in three dimensions, adding an understanding of the complicated forces of nature (gravity, pressure, stress) and how they affect everything. This was their long-held definition – “the art of directing the Great Sources of Power in Nature for the use and convenience of man[kind]...”.<sup>11</sup>

Later amendments to the Surveyors Act aimed to harmonise the surveyor/engineer relationship. In 1892, the Associate membership of the Institute was widened to include holders of engineering diplomas from New Zealand or other universities, Membership of the Institution of Civil Engineers (MICE), Associate Membership of the Institution of Civil Engineers (AMICE), and existing engineers of local bodies with no qualifications but at least three years’ experience. The following year Full or Corporate membership opened to engineers, allowing them to be elected to governing positions.<sup>12</sup>

## MOTIVATION FOR ENGINEERING INDEPENDENCE

In the early days of colonisation, a natural tendency was for people with multiple skills to offer their full range of services. The term “engineer” could mean an articulated apprentice, grimy mechanic, factory foreman or a qualified professional. Before it offered degrees in engineering (in 1893), the Canterbury College School of Engineering taught the lesser associateship of engineering – “courses of less difficulty... eminently suitable for young men taking up engineering work in the Dominion”.<sup>13</sup> There was no regulation imposing minimum qualifications on people hired to do public engineering works, and a number of unqualified people outside the surveying profession even set up shop under the banner engineer.

Given the low standards set for engineers, examples of engineering misadventures are few. Some of the 60 Harbour Boards formed under the Harbour Board Act 1870 made mistakes “of faulty, even amateurish engineering, but more often of the economic facts of life”.<sup>14</sup> In these cases the Government’s Marine Department bailed them out and finished or abandoned their unwise harbour works. Much money was “squandered by following rule-of-thumb methods...”.<sup>15</sup>

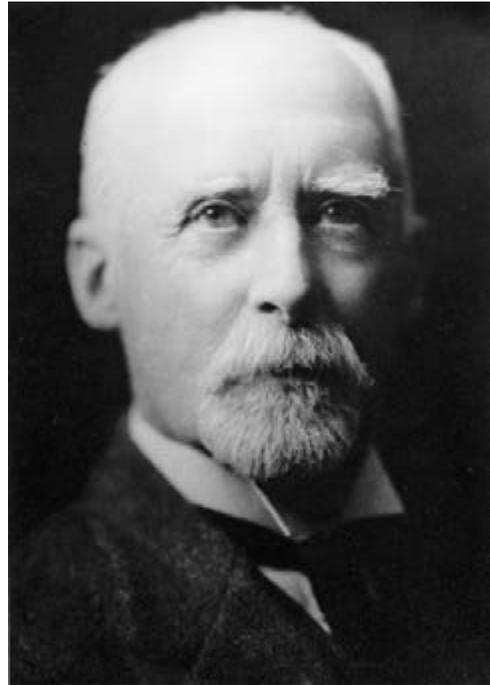
There were failures of early road surfaces until a durable tarseal was found (John McAdam's recipe, from which we get the word "tarmac"), but these were gradual and unspectacular. Virtually every major mining, blasting or tunnelling project caused casualties, but these were expected in such dangerous conditions. A notable mishap was the Wainuiomata dam failure in 1884. Just completed, it was breached in a freak summer storm in January and the repairs led to acrimonious debate, a Waterworks Investigation Committee and finger-pointing by various city surveyors/engineers and consultants.<sup>16</sup> The engineer responsible, James Baird (1840–1908), had learnt engineering as a railway apprentice in the 1850s and possessed no higher qualification.

Engineers did not feel represented by the NZIS, nor by the New Zealand Institute of Architects (NZIA) formed in 1905 and the New Zealand Institute of Draughtsmen formed in 1908. Engineers felt they needed a voice.

Some county councils interviewed only licensed surveyors for their engineering roles.<sup>17</sup> This caused public debate when in August 1911 Waimea County Engineer for over a decade, James Littlejohn (1869–1943), was appointed Nelson City Engineer. He was ill-qualified for "the laying out, construction and maintenance of bridges in timber, iron and ferro-concrete, river protection, drainage, [and] street lighting".<sup>18</sup>

This led a leading engineer of the time, Robert West Holmes (1856–1936), to perceive a "lowering of the status of our profession – a cankering influence which we must unitedly do our best to counteract".<sup>19</sup> Also, New Zealand's egalitarian society tolerated open criticism of public works by people ill-qualified to comment. Citing an anonymous project, Holmes said it was invidious to have a qualified engineer at work while "some 256 gentlemen, more or less [members of the NZIS], considered themselves competent to advise, and did so, until an opportunity occurred for the engineer to flee from the scene".<sup>20</sup>

Surveyors possibly felt threatened by the rise in influence of engineers. Their response was later called "jealousy and misunderstanding".<sup>21</sup>



*Robert West Holmes.*

*Past Presidents of the New Zealand Institution of Engineers, 1914–1966 Album, IPENZ Collection.*

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Engineers were also alarmed at perceptions of unprofessionalism among themselves and accusations of overspending or mismanagement. They aimed to impose standards on all professionals employed in positions of responsibility by local authorities. Though engineering degrees were conferred in New Zealand, many in the profession did not possess them. Rather, they rested upon years of successful experience in the field or membership of one of the parent or home institutions in the United Kingdom – the civil, mechanical and electrical engineering institutions like the Institution of Civil Engineers (ICE), the Institution of Mechanical Engineers (IMechE) and the Institution of Electrical Engineers (IEE) – entry to which involved passing a written exam.

In 1911, the NZIS proposed that all people employed by local government bodies in positions of responsibility for public works – like Littlejohn in Nelson – should compulsorily be members of the NZIS.

This was like a red rag to a bull, inciting engineers to act.

### LOCAL GOVERNMENT ENGINEERS 1912

Several factors created the environment in which local government engineers rebelled against the surveyors.

A Roads and Bridges Department had been formed in the 1890s and took from local authorities the responsibility of making nationally-significant roads. When it was absorbed into the Public Works Department (PWD) in 1909, the responsibility for making roads again fell on local government. The 125 county councils, by dint of their vast rural coverage, traditionally had around three-quarters of all roads and bridges to maintain.<sup>22</sup>

Rural councils with weak ratings and many roads to lay were particularly vexed. They were, however, voted extra money for this function, so cost was not the issue. More importantly, many local authorities felt ill-equipped – or their surveyors/engineers under-qualified – to take on the work. Indeed, some only had foremen to plan and oversee major works.

When the road was of strategic importance, such as through gorges or alpine passes, or high-capacity main arterial routes, local authorities asked PWD engineers to help.<sup>23</sup> This required the PWD “not only to report but to draw up complete drawings, watch the work, and certify to the payments. This entailed unwelcome work on the department, and work outside its province...”<sup>24</sup>

The surveyors were also concerned about the lack of accountability, but felt it to be “a subject that hardly comes within the scope of our Institute to deal directly with any representation to the Government, as the men who fill the various offices of engineers to county councils, roads boards and municipalities need not necessarily be surveyors.”<sup>25</sup>

The solution proposed by the Engineer-in-Chief, Robert Holmes, was to recognise appropriate qualifications and thus seed the local councils with professional engineers. He suggested:

...a board should be set up and examinations held on the lines of the surveyors' examination. Certificates would be granted to such men as could satisfy the Board, but after its establishment a qualifying examination would have to be passed... Two or more grades could be established, one to cover roadworks, smaller bridges, and such work as came essentially within the province of surveyors; the other grade could include larger works, covering also mining and electrical engineering. A committee was being set up to comprise engineers and surveyors in both private and Government practice to draw up recommendations and a syllabus, and report with a view to legislation at an early date.<sup>26</sup>

Rather than letting surveyors imprint their mark on the engineering profession, this offered engineers independence. The Institute did not like his proposal and repeated that all local government engineers should be authorised surveyors, or members of the NZIS.

Things came to a head in Taranaki in June 1911 when the Railways department issued trespass notices to surveyors. The surveyors had to apply "tact and foresight" to overcome this "difficulty in effecting the desired connection".<sup>27</sup> They had to get permits from resident engineers to enter railway lands.

Local government engineers acted over the summer. They first met in February 1912 in Palmerston North, hosted by Nelson's former Borough Engineer (now acting for Palmerston North Borough), Samuel Jickell (1856–1939). Attending were RJ Dillon (engineer to the Pahiatua County Council), Roy Lindsay Harding (1885–1973) from Oroua County, the Collingwood County clerk FG Blake, Arthur Henry Moncrieff Wright (b.1882) from Patea County, and Sydney Arthur Robert Mair (1872–1961) of Hunterville, County Engineer to the Rangitikei County Council since 1899. On their behalf, Mair then sent out a circular to 80 local government engineers throughout the country.<sup>28</sup>

They proposed forming a body representing local government engineers. Media comment was favourable: the new institution would

...establish examinations and issue certificates to engineers qualified for service on local bodies, prepare papers, and exchange views and experiences upon matters such as road-making, tramways, lighting, drainage, water supply, etc. The promoters consider that the interchange of views amongst local government engineers of the Dominion must prove of the greatest value to ratepayers and all concerned.<sup>29</sup>

Seventy-four engineers replied to Mair's circular positively, with one against and five doubtful. This led the core group to agree to form a body called the Institute of Local Government Engineers of New Zealand (ILGENZ). It was to be for "the promotion of Engineering knowledge and practise in connection with local government work, and of the professional interests of members".<sup>30</sup> It had similar bodies in the United Kingdom and Australia from which to seek support. Surveyors were unable to stop the schism.

The Institute held its first annual meeting on 20 March 1912, in Wellington. It talked of attracting new members, soliciting support from local government councils, and getting

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*ILGENZ Conference 1912, Wellington.*

*IPENZ Collection. Sydney Mair, Samuel Jickell, and Richard Rounthwaite are in the centre of the front row.*

the Institute on a sound administrative and financial footing. Fees for membership were a one-off joining fee of £22 for Full members (£1-1 for Associate membership), with annual subscriptions thereafter of £3-3 (£2-2 for Associate membership, Students £1-1, and Life membership £21). It mixed business with pleasure, holding a dinner at the Hotel Windsor on the 22nd. The meeting and dinner were hosted by the Institute of Marine Engineers of Australasia, whose Secretary Thomas R Wallace of Aitken Street became the first ILGENZ Secretary.<sup>31</sup>

### **“ONE STRONG SOCIETY”**

The ILGENZ first lobbied the Government to pass legislation that would incorporate the Institute, recognise the status of engineers and permit local public works to only be done under qualified engineers. “[E]very encouragement was given in the direction sought.”<sup>32</sup> The Institute also lobbied the Municipal Association on improving the position of engineers to local bodies and providing superannuation. Though the Municipal Association was “favourably disposed” to the Institute’s aims, it initially reserved its decision and then backed away from giving support.<sup>33</sup>

The Institute could be incorporated under existing legislation but, before any new bill could be prepared to meet the other needs, significant obstacles arose. The surveyors continued to test the demarcation line between themselves and engineers and objected to any proposed legislation.

Such legislation would have required the sponsorship of the Minister for Public Works, and that was hindered by an unsteady political climate. Within a week of the Institute's first meeting the Liberal Government of Sir Joseph Ward (1856–1930) fell apart, and the succeeding McKenzie ministry was in power for less than four months. In July 1912 William Fraser (1840–1923) became Minister but the all-important portfolio representing surveyors, the Minister of Lands, was held by the new Reform Party Prime Minister, the intractable William Massey (1856–1925).<sup>34</sup> Riding a wave of rural and agricultural support, it was not a propitious time for “farmer Bill” to start pushing for the rights of the engineer who was seen largely as a “townie”.

The Institute got down to domestic business. It continued to encourage councils to support it and pay for their engineers to attend its meetings. Those agreeing to do so were publicly commended.

As well as aiming to raise the status of engineers, the Institute was unwittingly linked to their levels of income. Councillors from Sydney Mair's own Rangitikei County Council compared the Institute to a trade union. “Does the Institute belong to the Federation of Labour?” one asked, laughingly. Mair explained that it “had been formed with the object of raising the status [of engineers], and by raising the status it was confidently anticipated that a higher standard of work would result”. When asked further if this meant paying higher salaries, Mair “replied that the increase of salaries was not primarily the object of the Institute; at the same time he was quite confident that if the engineers did better work, there would never be any exception taken by local bodies to remunerate accordingly”.<sup>35</sup>

The ILGENZ formed a council which first met in Wellington on 24 September 1912. Samuel Jickell was elected first President, with Mair and Wellington consulting engineer Richard Septimus Rounthwaite (1854–1932) as Vice Presidents. Roy Harding was Treasurer, with Thomas Wallace still Secretary. Another 10 filled the first council. Of the full membership at the end of the first year, four per cent were with city councils, 25 per cent town/boroughs, 38 per cent county councils, and 15 per cent private practice. Nine men came from harbour, drainage or roads boards, and six from the PWD. Two were based in Tonga and one brave soul, E Taylor of Napier, probably faced the wrath of his colleagues where he worked – in the Survey Department. Two-thirds were North Islanders.<sup>36</sup>

The ILGENZ started with a membership of 25, which climbed within a year to 90. Its second annual meeting was held in Wellington on 28 March 1913, and technical papers and minutes from this were published in the first *Proceedings* later in the year. A majority of papers were on the problem of finding a durable seal for roads.<sup>37</sup>

Election to membership of the Institute became a hallmark of quality, reported in the local media. Frank Hempleman (1877–1963), for instance, cited his membership when promoted to Gisborne Borough Engineer after eight years at Wellington.<sup>38</sup>

### OTHER INSTITUTIONS

The Institute was not formed in a vacuum – New Zealand engineers had access to other professional associations.

A New Zealand division of the Australasian Institute of Marine Engineers had formed in the 1890s, with a membership in 1910 of 585. This was regarded more as a union for nautical engine drivers and steam plant operators. They were ill-regarded – the river-steaming engineer for instance being called a “shovel engineer”.<sup>39</sup> As a country with strong maritime traditions, and founded largely at the same time as the revolution in steam propulsion, New Zealand’s early marine engineers were an important part of the sector. The relationship with the Institute of Marine Engineers may, however, have been quietly dropped in 1913 when the divisive maritime strike pitted employer against employee, a battle in which the local government engineers would have wanted no part.

The influence of other Australian engineering bodies also extended across the Tasman. Engineering associations had formed in New South Wales and Victoria by the 1880s. An Australasian Institute of Mining Engineers formed in Broken Hill in 1893 and it attracted some mining engineers from the many gold and coal mines in New Zealand.<sup>40</sup>

A body which perhaps influenced the establishment of the ILGENZ was its Australasian counterpart, which formed in 1909 in Australia as an amalgam of some of the state engineering institutes. Dunedin’s City Engineer and Town Clerk since 1905, RW Richards, was the first President of the Institute of Local Government Engineers (ILGE) of Australasia (being a former Sydney City Surveyor and Alderman). At its inaugural conference Richards said “he felt sure his brother officers in Wellington, Christchurch and Auckland would hail the inauguration of this institute with the greatest of pleasure. He was proud to have the honour of becoming the first member to represent New Zealand.”<sup>41</sup> This body became the Institution of Engineers Australia (IEAust), but not until after the First World War.

A British model for the ILGENZ was the Institute (later Incorporated Association) of Municipal and County Engineers (IMCE), which had several New Zealand members.<sup>42</sup> Even the American Society of Civil Engineers and American Institute of Electrical Engineers were represented here.<sup>43</sup> Migration among the English-speaking “frontier” societies was common, leading to many New Zealand engineers gaining experience in Australia, the United States, India and Africa.

The activities in New Zealand of overseas institutions were minimal, given the distances involved and languidness of communications. A few New Zealand members attended Australian conferences, which always included visits to local works and a tour of other engineering sites of specific relevance to the visitor, but these could consume many weeks.<sup>44</sup>

Membership of the three old British institutions (of civil, mechanical and electrical engineers) remained the more prestigious and influential. The British “parent” or “home” institutions, as they were regarded, had been established in the 19th century. As inevitable outcomes of the industrial revolution, they were the model that many tried to emulate.

ICE was established in London in 1818, developing the professional side of what was up to then a social Smeatonian Society. That had been formed in the late 18th century by John Smeaton (1724–1792), who first published the term “civil engineer” (as distinct from military) in 1768 coinciding with the establishment of several schools of engineering in European capitals. ICE received a Royal Charter in 1828, listing the engineering disciplines covered. These did not fully encompass the new discipline of railway engineering, which by the 1840s was enjoying a boom.

Mechanical engineers from the railway and steam industries therefore formed their own institution, IMechE, in 1847, based in Birmingham. It incorporated in 1877, when its head office relocated to London.

By then the power of electricity had been tapped and its use in the telegraph was revolutionising world communications. Between 1865 when the first trans-Atlantic cable was laid, and 1871 when the telegraph reached China and Japan via Russia, much of the world was linked up (New Zealand joined this world-wide web five years later). After the British Government established a monopoly in telegraph ownership, the Society of Telegraph Engineers formed in 1871. It became the IEE in 1888.

The rigorous entry criteria for these three institutions included written exams and peer review, which made membership the hallmark for professional standards long before university degrees (first conferred in 1872, by the University of Glasgow) became the accepted measure.

The Old World institutions carried a perceived advantage that pervaded in New Zealand. For instance, when Napier was seeking advice on how to develop its inner harbour, three “colonial” engineers gave their opinions, which differed from each other’s. The local paper said “if the president of the [United Kingdom] Institution of Civil Engineers was asked..., we might have an investigation which would settle the matter once and for all.... And an English engineer of high standing would be absolutely free from local bias, and would have no hesitation in speaking out his mind.”<sup>45</sup>

That these members of the parent institutions were called “engineers of eminence” (by the President of ILGENZ) gives a hint of the class distinction being made.<sup>46</sup> Despite achieving many feats in breaking in the country, New Zealand-trained engineers had to fight a colonial cringe (or perception of inferiority) when compared with those from the United Kingdom. New Zealand members of ICE formed an Advisory Committee in order to vet potential members and “obtain the local colour which is necessary to enable the Home Council to grasp the local requirements”.<sup>47</sup>

Very few ILGENZ members, about five per cent in 1913, were members of the parent institutions. The ILGENZ was derided as a body of mere municipal engineers, to which “not only County Engineers, but Foremen, were eligible for membership”.<sup>48</sup> This had the effect of lowering the status of engineering in New Zealand – and had to end.

## PLUMBERS, ARCHITECTS, AND THE NEW ZEALAND SOCIETY OF CIVIL ENGINEERS

The Plumbers Registration Act in November 1912 also professionally squeezed the engineer, similar to the earlier attempts by surveyors. From 1 April 1913 the law said local government engineers employed on drainage or sanitary works had to be registered by a new Plumbers Registration Board. Previously, councils recognised any plumber’s qualification but now engineers would have to pass an examination set by the Board. The ILGENZ’s President Richard Rounthwaite said “this was most objectionable, and [the Council] was doing its best to have the provision amended”.<sup>49</sup>

In the same year, yet another profession tried to claim rights over the engineers’ role in local authorities. The NZIA got a sponsor to introduce a bill incorporating itself and establish an Architects Registration Board.<sup>50</sup> They wanted the “complex art” of architecture included in construction, for which engineers who were trained only with “book knowledge” would be deemed unsuitable.<sup>51</sup>

Engineers could become registered architects if they had five years’ experience and “satisfie[d] the Board” as to their proficiency.<sup>52</sup> Worse still, local authorities would be forced to hire architects for any building or structural work costing over £1,000 of public funds.<sup>53</sup> Works primarily of an engineering character, such as bridges, tramways or stations, would have to employ a registered architect alongside the engineer. This was a re-run of the attempted coups by surveyors and plumbers.

At the next ILGENZ conference in February 1913, Dunedin consulting engineer Frederick Joseph Williams (1876–1944) called this “a piece of audacity on the part of architects to attempt to dictate to properly qualified engineers how a bridge should be built”.<sup>54</sup> Waitemata County engineer GA Jackson told his employers the bill would affect all local bodies, to which a councillor added “all the county wanted was an engineer”.<sup>55</sup> Members of the ILGENZ spread the word to other councils, the weight of which (including the powerful Wellington and Christchurch City Councils) led to this clause being dropped. Redrafted without onerous obligations on local authorities, the architects’ bill became law in November 1913.

These bills did have one benefit, though, in that they recognised the principle of special qualifications for special skills, a status the engineers wanted for their profession.

The final straw is believed to have been the publication of surveyors’ regulations that said “a candidate for a license as a Surveyor shall submit to an examination on engineering surveys, to prove that he can carry out levelling work and the measurement of earthworks including practical tests”.<sup>56</sup>

Goaded into action, Robert Holmes, who had been involved in these discussions, said they needed to “clip the wings of the charlatan, the *bete noir* of the trained man”.<sup>57</sup> His anger over recent events is barely contained:

A short time ago it came to the knowledge of several Civil Engineers of acknowledged experience that an invidious attempt was being made to manufacture engineers by other means than the legitimate ones, and it thus appeared necessary to take drastic action to protect the interests of the profession....<sup>58</sup>

The Institute’s view was that surgeons, physicians, dentists, accountants, barristers, solicitors, teachers, plumbers, surveyors, architects, jockeys, and marine and land engine drivers, had to prove their ability before the law allowed their employment. But in the case of the civil engineer “anyone may practise, and many who do are totally uneducated, with the result that the profession is degraded, and emoluments are cut down, because the properly qualified practitioner is faced with competition by the charlatan”.<sup>59</sup>

Members of the parent institutions were keenly attuned to attacks on their profession. Even some surveyors recognised the need for an institute of engineers.<sup>60</sup> In 1913, the threat was such that the New Zealand Advisory Committee of ICE took action. Under the chairmanship of Richard Mestayer (1843?–1921), a consulting engineer who installed Wellington’s sewerage scheme in the 1890s, it determined to establish a body “on the lines of the societies formed by the surveyors, the architects, and the dentists, which should go to Parliament and do what this Institute of Local Government Engineers has been trying to do – get legislation to ensure that local government engineers are competent men, and fit to expend State and local government money”.<sup>61</sup>

Several members of ICE assembled in Wellington in December 1913. Holmes continues the narrative, directing his anger at surveyors:

The matter was so pressing that time did not allow of calling a general meeting, which was very much regretted. In consequence we have not had the universal support which is our due, particularly from those in Auckland. At that meeting, without one dissident, it was decided that the formation of a strong Society must be the first step, and with this object to invite the co-operation of the then existing Institute of Local Government Engineers. I must congratulate the members of that Institute in having so willingly and whole-heartedly joined in the scheme.<sup>62</sup>

The formation of the ILGENZ had not stopped in-roads being made, which led one of the few MICE on the Council of ILGENZ, Vice President William Ferguson (1852–1935), to act.<sup>63</sup> He had joined the ILGENZ “with the avowed object of endeavouring to enlarge its scope” after he became aware that it faced ongoing opposition by surveyors and was not getting traction on its desired legislative reform. He saw “the limitation of its title” holding the Institute back.<sup>64</sup> Ferguson was also now the Chair of the New Zealand Advisory Committee of ICE and suggested something more representative than the ILGENZ.

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Ferguson proposed a “strong society representative of all branches of the profession”.<sup>65</sup> It would have more weight and be more satisfactory than two or more societies, a hint that these “engineers of eminence” would not stop at forming another society if the ILGENZ rejected their advances. Encouraged by the ILGENZ Council, the matter would need the consent of the full membership. This was therefore sought at the second ILGENZ Annual General Meeting (AGM) in Auckland on 19–20 March 1914 under the Chair of retiring President Samuel Jickell. After the welcome by the local mayor, His Worship Christopher Parr (1869–1941), which became a tradition at annual conferences for years, an election of officers took place. Appointed scrutineers polled the 42 members present and announced Rounthwaite duly elected President. He then spoke and immediately suggested the winding up of the Institute which had just elected him. If the members were agreeable, he added, the ILGENZ would at the same time incorporate itself as a new body representing all engineers.<sup>66</sup>

Debate against the move revolved around the disadvantages to local government engineers, such as giving up the prospect of affiliating with the IMCE in the United Kingdom, which was under negotiation. A more parochial view was that the reform motion was only desired by a few Wellington members of an English institution, bearing little relevance to New Zealand and the large programme of works ahead of it.

Most members favoured one stronger society that would represent all disciplines. One member said ILGENZ’s aim had been to “improve the status of the profession” but naming it for local government “somewhat cramp[ed] its scope”.<sup>67</sup> Rounthwaite said the ILGENZ “will be greatly strengthened and will become a much more influential body by the addition of engineers of eminence”. He was personally in favour because “a combination of all Engineers in the Dominion would make a very strong and influential society and, after all, we cannot get away from Euclid’s axiom that ‘the whole is greater than [the sum of] its parts’”.<sup>68</sup>

Before the vote was taken, members understood that the ILGENZ Council, as elected that day, would carry on running the new body, along with its finances and property (some secretarial items and a small library). The ILGENZ members would automatically become members of the new body upon paying their next year’s subscription. They agreed with one condition – that £200 of the existing funds be dedicated to a Benevolent Fund for hard-up engineers. Many MICE/AMICE who were not existing members of the ILGENZ promised to join, and with 100–120 estimated to be in New Zealand, this would double its membership.<sup>69</sup>

The proposed name of the new body had been mentioned in a letter sent out to all members on 18 February, giving notice of this reforming motion. It had been discussed at length at the earlier joint meeting of ICE and ILGENZ members. It seems the word “Society” was chosen deliberately as being more informal and redolent of the style in American or Continental organisations. There were already societies of engineers in Victoria and New

South Wales, and societies of mechanical and civil engineers, and of junior engineers, in the United Kingdom. The bottom line for Ferguson was that the word “Society” did not clash with “the parent institution... even though we may not be members of it”.<sup>70</sup>

The vote approved the motion, bringing the New Zealand Society of Civil Engineers (NZSCE) into informal life on 19 March 1914. It was formalised with incorporation on 16 June. Nine days later Rounthwaite resigned as President and accepted the paid position of Secretary (his office at 4 Willis Street became the Society’s office). Holmes then stepped into the role of President.

The aims of the NZSCE were to:

- Promote professional intercourse and the advancement of engineering, and safeguard the professional interests of members
- Educate members through technical papers delivered in annual conferences and branch meetings, and publishing proceedings
- Include all branches of the profession – civil, mechanical, electrical
- Gain recognition of the Society and membership in it as “a guarantee of satisfactory quality in practice of profession”<sup>71</sup>
- Establish a suitable home for the conduct of the Society, with space for the paid Secretary, a library and meetings
- Operate a Benevolent Fund.

Wellington was “naturally” chosen for Head Office, as the seat of government and headquarters of engineering departments.<sup>72</sup> A council of a President, two Vice Presidents, Immediate Past President and 10 members would be elected by members at the annual conference. An Honorary Secretary and Honorary Treasurer would also be elected, with a paid Secretary appointed to run the office. The President, one Vice President, the Immediate Past President and five council members were to retire each year. An Executive Committee would form from members of the Council living in or near Wellington and would meet monthly to carry out the Council’s work. Special committees could be formed as and when required.

Immediately after the Society was formed, Charles Dugald Kennedy (1858–1929), Surveyor for the Hawke’s Bay County Council, got up and read his paper “Shingle Action in Hawke’s Bay”.<sup>73</sup> This was the real reason the Society existed – to focus on the nitty-gritty of engineering in New Zealand.

## FIRST WORLD WAR

Less than two months after the NZSCE was incorporated, New Zealand was at war. Service during the First World War took many members from their normal vocations.

In 1914, the second set of *ILGENZ Proceedings* was published (by the NZSCE) but the third set in 1915 was the Society’s own, and it restarted the numbering at volume 1.

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*ILGENZ Conference 1914, Auckland.*

*IPENZ Collection. Richard Rounthwaite and Walter Bush are seated centre of the second row.*

Branch activities started fitfully during the War, Canterbury kicking things off in 1915. The Taranaki Branch first met in 1916 and North Wellington (in Palmerston North) in 1918, along with Auckland.

During the First World War, the NZSCE lamented the death of a member, members' relatives and also some non-member engineers with whom they worked. Motions of condolence were passed at each wartime conference "in silence", every delegate standing.<sup>74</sup> After the War the Society published a roll of New Zealand civil engineers who served (of whom 30 were members).<sup>75</sup>

While the War hindered the early years of the Society, it did wonders for the confidence of New Zealand's military and civil engineers. Kiwi Sappers on every battlefield (particularly tunnellers and bridge builders) proved themselves adept. They gained admiration as well as honours. In the short-term, the experience led to an increase in confidence in the 1920s as New Zealand's infrastructure developed. Longer term, it helped produce a fine military engineering contribution to future wars.

While the NZSCE took an interest in its members' service, it did not spend much time studying the constructional aspects of the War beyond Frederick Furkert's (1876–1949) article on municipal engineering aspects of military camps at Featherston and Trentham.<sup>76</sup>

## ENDNOTES

- 1 Elsdon Best, *The Pa Maori – An Account of the Fortified Villages of the Maori in the Pre-European and Modern Times...*, (Wellington: Te Papa Tongarewa, 1995), 435. *Engineering Dimension (ED)* 70, May 2008, 9.
- 2 John Eldon Gorst, *The Maori King*, Edited by K. O. Arvidson (Auckland: Reed, 2001), xi.
- 3 Hazel Petrie, *Chiefs of Industry – Maori Tribal Enterprise in Early Colonial New Zealand* (Auckland: Auckland University Press, 2006), 22.
- 4 Diana Neutze and Eric Beardsley, *Design for a Century – A History of the School of Engineering, University of Canterbury 1887-1987. University of Canterbury*, (Caxton Press, Christchurch, 1987), 16.
- 5 *Appendix to the Journals of the House of Representatives*, 1904, D-1, i.
- 6 S. Cory-Wright, "The construction and commissioning of the Lake Coleridge power scheme in 1914," *New Zealand Engineering (NZE)* 31:15 (1976): 221-25.
- 7 Quote, *Journal of the New Zealand Institute of Surveyors treating of Engineering, Surveying and other cognate subjects*, 1:1 (1889): 6, [www.surveyors.org.nz/about/history](http://www.surveyors.org.nz/about/history). An earlier Institute had formed in 1881, but soon folded. The institute was recognised and incorporated by the New Zealand Institute of Surveyors & Board of Examiners Act 1900, which made membership open to 21-year-olds with the minimum qualifications (a certificate of competency issued by any Australasian Board of Examiners or, before this act, by the New Zealand Surveyor-General) and licence issued under the Act; see also 'Maps and Mapping,' *Encyclopaedia of New Zealand*, Edited by AH McLintock (Wellington: R. E. Owen Government Printer, 1966), 487.
- 8 James A McRae, *New Zealand Institute of Surveyors, 1888-1988* (Dunedin: The Institute, 1989), 330.
- 9 *Journal of the New Zealand Institute of Surveyors...1:1* (1889):3.
- 10 NZSI President HE Haddon in 1894 said, "Surveying and Engineering are kindred professions, both of which require its students to be fair mathematicians... It has been said that any surveyors is capable of laying off roads and railways but in my experience this assertion is not borne out in practise...., each profession requires separate training..." McRae, *New Zealand Institute of Surveyors*, 331.
- 11 Garth Watson, *The Civils: The Story of the Institution of Civil Engineering* (London: Thos Telford, 1988), 19. Definition of the Institution of Civil Engineers. This was incorporated in the Institution of Civil Engineers Royal Charter, granted by King George IV in 1828. The surveyor would explain that this two-dimensional aspect was the field work, the survey, the machinery of what they do, the rest being the theoretical profession or "life work" that extends into town or rural planning, engineering, design or other roles. McRae, *New Zealand Institute of Surveyors*, 334, citing Crompton Smith's June 1919 article in the *NZIS Journal* on 'The Survey Profession and the Training of Pupils.'
- 12 McRae, *New Zealand Institute of Surveyors*, 330.
- 13 *Colonist*, 5 March 1910, 2.
- 14 John O'Connell Ross, *Pride in Their Ports: The Story of the Minor Ports* (Palmerston North: Dunmore, 1977), 13.
- 15 Mr Garland, *New Zealand Parliamentary Debates (NZPD)*, vol. 204, 24 September 1924, 1099.
- 16 Peter Cooke, *Our Water History - on Tap: Water Supply in the Wellington Region 1867-2006* (Wellington: Greater Wellington Regional Council, 2007), 9.
- 17 Obit, *Evening Post*, 27 December 1943, 3.
- 18 *Colonist*, 12 August 1911, 2. Neil G Hansen and J Noel Hall. *The County Engineers of New Zealand, 1876-1989* (Tauranga: Association of Local Government Engineers of New Zealand, 1993), 43. A licensed surveyor, he was also chairman of the local branch of the NZIS.
- 19 RW Holmes, *Proceedings (Procs) of the New Zealand Society of Civil Engineers (NZSCE), 1914-15*, vol. 1 (Wellington: NZSCE, 1915), 27.
- 20 *Ibid*. The event was not disclosed but could have been allegorical.
- 21 WL Newnham, *Learning, Service, Achievement – Fifty Years of Engineering in New Zealand*, edited by FN Stace (Wellington: New Zealand Institution of Engineers, 1971), 21.
- 22 Hansen and Hall, *The County Engineers of New Zealand*, 223, shows County Councils at the time of their dissolution in 1989 maintaining 75 per cent of all roads (92,974 km, municipal bodies having 13 per cent of roads and the rest being state highways, maintained by central government), and 73 per cent of the country's 14,964 bridges (though if measured by the length of bridges, they had only 55 per cent).
- 23 *Evening Post*, 28 March 1911, 3.
- 24 'Surveyors Meet. General Gathering of the Institute,' *Evening Post*, 26 January 1911, 4.
- 25 *1893 Annual Report*, NZIS, cited in McRae, *New Zealand Institute of Surveyors*, 331.
- 26 'Surveyors Meet. General Gathering of the Institute', 4. Holmes still thought at this stage that PWD would oversee the work of these new engineers, "accept[ing] drawings passed by these engineers and mak[ing] progress payments". *Ibid*.
- 27 *Wanganui Chronicle*, 6 November 1911, 7.
- 28 Arthur Henry Moncrieff Wright was the son of engineer Arthur Blundell Wright (1852-1925). Sydney Mair had famous war-fighting uncles – Gilbert, Henry and William – who pursued Māori dissidents in the 1860s and '70s. Ron Crosby, *Gilbert Mair – Te Kooti's Nemesis*. Reed, 2004. Sydney's father Robert was older brother to the soldier Mairs. *Hawera & Normanby Star*, 2 March 1912, 4. *Evening Post*, 23 March 1912, 6.
- 29 *Evening Post*, 10 February 1912, 8. Jickell, Mair, Dillon and Harding met in Palmerston North on 9 February 1912 to arrange the first general meeting in Wellington (the location favoured by 50 of the respondents) on 21-22 February, but it had to be delayed one month.
- 30 FW MacLean (ed.), 'A Retrospect, 1914-35' in *NZSCE History 1914-1935 and General Index to Proceedings Vols I-XX* (Wellington: NZSCE, 1935), 10.
- 31 *Evening Post*, 23 March 1912, 6. Minutes of the first meeting could not be located.

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- 32 *Proceedings of the Institute of Local Government Engineers New Zealand (ILGENZ)*, vol.1 (Palmerston North: ILGENZ, 1913), 24.
- 33 'Ordinary Meeting,' *Ashburton Guardian*, 20 August 1912, 6.
- 34 Guy H Scholefield (ed.), *New Zealand Parliamentary Record 1840-1949* (Wellington: Government Printer, 1950).
- 35 'The Curse of the Country,' *Wanganui Chronicle*, 7 October 1912, 5.
- 36 *Procs ILGENZ 1913*, 27-29.
- 37 *Ibid.* Newnham, *Learning Service Achievement*, 17. Charles Bremner also talked of the imminent opening of the Panama Canal.
- 38 *Poverty Bay Herald*, 23 September 1912, 4. Another example is the election of Charles Morrison of Ashburton County. *Ashburton Guardian*, 4 October 1912, 4. The County Council "warmly congratulates Mr Morrison on his election as a member of the Institute of Local Government Engineers, and expresses its appreciation of the valuable services he had rendered the Council. The motion was seconded by Mr W Morgan, and carried unanimously. Mr Morrison briefly acknowledged the compliment paid him."
- 39 *Evening Post*, 2 July 1912, 3. See also *The Press*, 3 August 1911, 8.
- 40 Engineering members of the Royal Society of New South Wales formed their own Engineering Association in 1870. A Victorian Institute of Engineers followed in Melbourne in 1883, and a Northern Engineering Institute of New South Wales in 1889. An Australasian Institute of Mining Engineers formed in Broken Hill in 1893.
- 41 *Sydney Morning Herald*, 1 November 1909, 5. See also *Otago Witness*, 3 March 1909, 52. *Star*, 16 July 1909, 2. *New Zealand Truth*, 6 November 1909, 1.
- 42 'Personal Items,' *Press*, 30 May 1910, 6. Several senior New Zealand local government engineers besides Richards belonged to a number of these bodies, for instance Wellington city engineer William Hobbard Morton, Auckland city engineer Walter Ernest Bush and Greymouth county engineer John Higgins.
- 43 'Local and General,' *Wanganui Chronicle*, 28 March 1912, 4. Nelson Jones of Wanganui who installed Invercargill tramways' electric powerhouse was for instance an Associate Member of the latter.
- 44 An example is John Higgins, engineer to the Grey County Council, who attended the Australian ILGE meeting in October/November 1912, took six weeks. 'Personal,' *Grey River Argus*, 10 October 1912, 4.
- 45 *Poverty Bay Herald*, 28 April 1911, 4.
- 46 *Procs ILGENZ 1914*, 11.
- 47 *Ibid.*, 23.
- 48 Francis William MacLean at 1944 Annual General Meeting (AGM), *Procs NZIE*, vol.30:2 (1944), 102.
- 49 *Procs ILGENZ*, 1914, 18. The Plumbers Registration Board recognised the examination equivalent to the Honours Grade Certificate of the City and Guild of London Institute.
- 50 New Zealand Parliament, 'Act to make Provision for the Registration of Architects,' *New Zealand Statutes*, 1913, 68-81. Available from *Early New Zealand Statutes*, URL: <http://www.enzs.auckland.ac.nz/>. The New Zealand Institute of Architects Act became law on 22 November 1913. To gain registration architects had to have a recognised qualification or a minimum age and experience in architecture, and be of "good character and reputation" (section 9).
- 51 'Architects Bill, To the Editor,' *Evening Post*, 18 August 1913, 3. "[T]hey may pass very well an examination on the science of statics and dynamics" but "[t]hose men would be engineers, not architects heaven forbid." The redrafted bill was then being read a second time in the House.
- 52 'Act to make Provision for the Registration of Architects,' section 8(1)(d).
- 53 'Architects Bill Opposed by Christchurch Council,' *Evening Post*, 25 June 1913, 3. The original clause 36.
- 54 'Local Government – Engineers confer,' *Evening Post*, 28 March 1913, 7.
- 55 'Architects Bill Opposed,' *Evening Post*, 28 June 1913, 11.
- 56 *Procs NZSCE 1921-22*, 28. Surveyors' Examination Regulations published in the *New Zealand Gazette*, 7 August 1913, 2378, included among those qualified to sit surveyor exams people with "an associateship in engineering or in mining" in any New Zealand university college (and three years' experience), or a degree in civil or mining engineering from the University of New Zealand.
- 57 *Procs NZSCE 1914-15*, 27.
- 58 *Ibid.*, 26. Saying this in March 1915, Holmes refers to the encroachment on engineers' roles in local government by the Institute of Architects Bill before it was passed in a highly modified state in 1913.
- 59 *Ibid.*, 30.
- 60 LC Sladden called for such an institute in the 1913 AGM of the NZSI. He represented a provincial group (Taranaki), which may have seen the need more greatly than those in the main cities. McRae, *New Zealand Institute of Surveyors*, 333.
- 61 Mestayer's biography in Ferkert states he was born in 1854. However, obituaries and his Births, Deaths, and Marriages record show he was 78 years old when he died in 1921. Frederick William Ferkert, *Early New Zealand Engineers* (Wellington: Reed, 1953), 225-26. *Procs NZSCE 1914-15*, 23.
- 62 *Ibid.*, 26.
- 63 *NZSCE History 1914-1935*, 10.
- 64 *Ibid.*
- 65 *Ibid.*, 11.
- 66 *Procs ILGENZ 1914*.
- 67 *Ibid.*, 20.
- 68 *Ibid.*, 11.
- 69 *Ibid.*, 19. The £200 was the balance arrived at after making a rough calculation as to the Institute's liabilities.

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- 70 *Ibid.*, 21.
- 71 *NZSCE History 1914-1935*, 13.
- 72 *Ibid.*
- 73 *Procs ILGENZ 1914*, 34.
- 74 *Procs NZSCE 1917-18*, 5.
- 75 *Procs NZSCE 1918-19*, 373.
- 76 *Procs NZSCE 1921-22*, 296-316.



## CHAPTER 2

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# 1920s

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The main aim of the Society had been to put on a regular footing the profession of the engineer. The War slowed things down and placed the focus elsewhere, but immediately after it the NZSCE returned to its original crusade. It felt legislation to be the main way forward and succeeded in the 1920s in getting a law in place. The status of the engineer, however, remained an issue.

### **ENGINEERS REGISTRATION ACT 1924**

A bill in 1915 on the qualifications of engineers responsible for local authority public works got no response other than surveyors insisting they “shall be entitled to carry out the following works by virtue of their qualifications... levels, formation of streets and roads, water supply and drainage”.<sup>77</sup>

Prompted by an Australian act, a revised engineers’ bill was delivered to the Government in July 1919. It proposed that a local authority board be set up to issue certificates of qualification. George Warren Russell (1854–1937), Minister of Internal Affairs, however, thought it better for “the society to gain the same status as other professions [surveyors and architects] by a special Bill for registration, and they could then decide who were entitled to registration”.<sup>78</sup>

This was not the Society’s aim at all.<sup>79</sup> The engineers wanted a governing body to define qualifications necessary for efficient practice, and for engineers who met this standard to be entitled to a distinctive hallmark in the form of a registration. This would create a grading of professionalism in which some could be classed as on a higher tier than others.

Other professions did not see the engineers’ bid for registration in this open light. The surveyors particularly objected to what they perceived as creating an exclusive club which would be most likely to reject surveyors who called themselves “C.E [Civil]” or “Road Engineer”. The draft bill specifically exempted architects – but not surveyors.

Surveyors felt that their members would be open to prosecution if through their work they were seen as misrepresenting themselves as civil engineers.<sup>80</sup> The surveyors lobbied the Minister of Public Works in deputations that included several influential Members of Parliament, a calibre which the engineering community could not match. With this “determined opposition” by surveyors, the Minister of Lands directed that the Bill not proceed.<sup>81</sup>

The NZSCE President and Chief Engineer of New Zealand Railways, Francis MacLean (1858–1951), lamented that “the opposition of the New Zealand Institute of Surveyors was a very important factor in influencing Cabinet not to take up the... Bill as a Government measure, and in not granting facilities for the passing of such a measure as a private Bill”.<sup>82</sup>

Speakers seethed at the next conference, including MacLean:

The Society of [Civil] Engineers had never made any proposal that engineering work should be confined to members of the society. The surveyors had set themselves up as enemies of the civil engineers, but the civil engineers did not intend to carry the War into the enemy’s camp. It was remarkable that surveyors should claim the right to do almost every class of civil engineering work. They made extraordinary demands, whereas the proposal of the engineers was most moderate and unselfish.... The surveyors should be members of our own household. Instead of that, they are our enemies, and if they continue to show fight, then we will fight.<sup>83</sup>

Despite the surveyors also calling engineers their “protagonists”,<sup>84</sup> they did not draw pistols at dawn. Wiser heads prevailed to smooth over differences between the organisations. A sixth of the 305 NZSCE members were licensed surveyors, so the debate was also an internal one. In reality, engineers were using the same arguments that the surveyors and architects had to define their professions, only the engineers were unique so far in being unsuccessful.

Not all surveyors sided with their own institute. Licensed Surveyor Thomas Ward (1849–1934) of Wellington said the two professions should in no way be regarded as sister professions. He added that the surveyors were acting not like a sister profession but, because their Institute was older, more like a mother-in-law.<sup>85</sup>

The Society sat down with the surveyors again in August 1922 to negotiate a mutually-acceptable bill, but the surveyors resisted.<sup>86</sup> The Society proposed to leave untouched the NZIS’s founding act, but the surveyors instead claimed they were “qualified to design, lay out, and construct such works as the Otira tunnel, or water supply and drainage schemes for cities like Auckland, Wellington, Christchurch and Dunedin”.<sup>87</sup> Even the NZIS President, Arthur Hastings Bridge (1881–1958), said this “unfortunately seemed to have made it appear as if the institute was claiming that its members were high-class engineers qualified to undertake a large range of engineering works”.<sup>88</sup>

Frederick Furkert said “if anyone had a big enough cheek, he could put up a sign, ‘Bill Smith, Civil Engineer’, and no one could say him nay.... There were men practising who had

not a ha'porth [halfpenny worth] of knowledge of their job.”<sup>89</sup> Even surveyors derided the “rule-of-thumb foremen” who had too much involvement in road formation.<sup>90</sup>

The Society slowly garnered support from backbenchers and senior public servants to progress the matter. The Government again offered to put a bill before the house, but opportunities for it did not present until August 1923. The draft Engineers Registration Bill suggested by the Society was circulated to local authorities. It was heavily influenced by the law in force in Australia, extracts of which were circulated so that members could impress upon their local Members of Parliament the “reasonableness” of their claim.<sup>91</sup> In introducing the Bill, the Minister of Public Works, Gordon Coates (1873–1943), hoped the House would “recognise the importance of good engineers, and that some hallmark of efficiency should be laid down.”<sup>92</sup> The Society welcomed Coates as a “keen, bright, new, young... lively man among... old-age ministers” which “the country had suffered from.”<sup>93</sup>

The Engineers Registration Bill was re-introduced in July 1924. Some Members of Parliament wanted measures added that took action against qualified engineers who made mistakes, but this was deemed impractical (the House hearing that lawyers, surgeons – and even politicians – make mistakes). Others wanted the period in which engineers could apply for registration to be extended, allowing those whose studies had been interrupted by the recent War a chance to catch up. The Bill also did not define what constituted an engineer, which some thought a shortcoming.

The main driver for the legislation was that unqualified engineers should be excluded from doing local authority public works. When the Society’s delegation handed the draft to Prime Minister Massey, he immediately said this aspect “would not meet with approval” and instructed it be deleted.<sup>94</sup> This left the Bill as merely a registration act. Samuel Jickell had said early on “he did not think Mr Massey was with them, because it would take the political influence away” – and lose him votes.<sup>95</sup>

After a big debate in August 1924, the Bill went into committee. After minor changes and rubber-stamping by the Legislative Council, the Engineers Registration Act (ERA) became law on 11 October 1924. Despite the loss on the local authority public works issue, it was a success for the Society on the question of standards. Registration was all about standards, and at least now standards could be set. It would be a large benefit to engineers, rate-paying communities and the general public. It was accepted on the basis that “half a loaf is better than no bread.”<sup>96</sup>

Coates added that while this Bill would not tell local authorities who they should put in charge of their public works, such a measure would eventually also be necessary.<sup>97</sup> He was also disappointed by this outcome, as he thought the profession was “one of the highest callings in the land.”<sup>98</sup>

## GETTING REGISTERED

The ERA created the Engineers Registration Board (ERB) and the label “Registered Engineer”. This was equivalent to “Chartered Engineer” in the United Kingdom (allowed through ICE’s Royal Charter). Unlike in the United Kingdom, applicants did not have to join the NZSCE to become registered, a pre-condition the Society had rejected.

To become registered, an engineer had to be at least 24 years old with a recognised qualification and three or more years’ experience. Any not “of good character and reputation” were rejected.<sup>99</sup>

The qualifications were defined as a “certificate, diploma, degree, or license granted by some university, college, or other public institution (whether in New Zealand or elsewhere), and which is recognised by the Board as furnishing sufficient evidence of the possession of the requisite knowledge and skill for the efficient practice of the profession of engineering”.<sup>100</sup>

A fine of up to £50 was able to be imposed on people providing false information or making fraudulent representations to gain registration. Engineers convicted of offences punishable by imprisonment or which “dishonour him in the public estimation” could be deregistered if their action rendered them “unfit to be registered”.<sup>101</sup>

Equally important were the Act’s effects on the unregistered. Section 14 could fine the unregistered £50 if they claimed to be registered. Prosecutions under the clause, however, were rare.

When it came into effect on 1 April 1925, the ERA not only set up the ERB but it also created a Registrar of Engineers. This officer opened a Register to list the names of engineers registered by the Board. These lists were published by the Minister of Public Works annually in the *Gazette* (as at 31 March).

New Zealand’s success was compared to that of others. Australians “looked with envy upon New Zealand engineers because of their Engineers Registration Act” and the United States had “expressed envy at the success of the New Zealand engineers in getting the Act placed on the statute book”.<sup>102</sup>

The Society was referred to a few times in the debate around the Bill. Frank Hockly (1865–1936), Member of Parliament for Rotorua, said the NZSCE “has undoubtedly raised the status of the profession”.<sup>103</sup>

The ERB comprised six members appointed by the Minister of Public Works. Three would be officials but the other three were nominated by the NZSCE.<sup>104</sup> These were to represent the civil, mechanical and electrical disciplines. The term of appointment was three years, or shorter if disability, insolvency, misconduct or crime eroded the member’s suitability. Departures from the Board were to be filled within two months, with the replacement seeing out the original member’s three-year term. Members elected their own Chairman who had an additional casting vote.

The first Board was appointed in March 1925 and served for two decades under Chairman Furkert; all were members of the NZSCE.<sup>105</sup>

Regulations governing the details of the Board's work were gazetted in June 1925. The cost of registration was set at £1-1, with 5s for a certificate to be issued. Searching the register also incurred a charge, but this applied more to employers vetting a prospective employee.<sup>106</sup>

A special clause applied to the existing community of foremen – engineers who had no qualification but lots of experience. They had to be over 25 years old and have six years' experience. They were able to obtain registration but only if they applied within 12 months. From 1 April 1926 this loophole closed, after which a qualification was mandatory.

The qualification could be an exam, set by the ERB to test the educational standards of applicants. For this the ERB adopted the examinations for an Associate member of the parent institutions, with the exception that a foreign language was not necessary. The first examinations were sat in April 1926 and the names of all successful engineers gazetted.

The first six names entered in the register are those of the ERB members, with Chairman Furkert listed at number one, having been registered on 4 August 1925. The first alphabetical list of registered engineers was published in September 1926. The 690 names were annotated to show whether they were registered through holding some recognised qualification, having passed the examination set by the ERA or had six or more years' experience in a recognised engineering field. None of the names was Māori or female. Under half those listed held membership in any of the British institutions.<sup>107</sup>

Over time the registers were updated with changes to their NZSCE or other membership status, such as promotion from Associate to Member, and deaths.

After the 1924 Act was passed, however, the old enmity between engineer and surveyors resurfaced. The surveyors fought back, aggrieved that almost half of the surveyors applying were rejected by the Board. In 1927, around 700 people had been registered, a count of surveyors amongst them showing that 30 had been successful with another 25 having failed.<sup>108</sup> The surveyors sought legal advice, raised a loan and mounted a campaign (including a petition) to lobby for greater consideration for surveyors.

Some engineers were also unhappy, having missed or not heard about the deadline for applying, or whose six years of experience was interrupted by the War. A group from Dunedin lobbied their Member of Parliament on this in 1927.<sup>109</sup>

This lobbying from both quarters was effective, leading to an amendment act in 1928. In this, a surveyor who could prove to the ERB that he had "substantial practical experience in engineering as part of his practice or employment" could gain registration.<sup>110</sup> Declined applicants could also now appeal. There was a one-off sop to the surveying community and to engineers whose careers were interrupted by the War, but it only applied for six months from the passing of the amendment, on 9 October 1928. Thirty-one surveyors rejected under the 1924 Act were now registered, 28 of whom were members of the NZIS.<sup>111</sup>

Around this time a problem arose of the ERB not recognising some certificates issued by the Canterbury University School of Engineering.<sup>112</sup> After the 1928 amendment, the surveyors met the ERB to discuss ways of aligning the initial study required for both surveying and engineering qualifications, which covered very similar subjects.

The regulations covering examinations were modified in September 1927 to allow preliminary surveying passes from the University of New Zealand to qualify towards preliminary engineering exams.<sup>113</sup> The following year the Board dropped the preliminary examination for civil engineers altogether, accepting in its place a pass in the University Entrance exam, formerly called matriculation.<sup>114</sup>

### THE SOCIETY'S FIRST PREMISES

To conduct its business, the NZSCE felt it needed its own permanent base. Richard Rounthwaite's office was adequate but proper offices would allow members to meet, use the library and form a presence in the heart of the Capital. The 1920 annual conference approved this step, after which office-holders started viewing sites.<sup>115</sup> A suitable one was found at 48–56 Molesworth Street, on the Aitken Street corner opposite Parliament and the General Assembly Library. The site was 762 square metres, with a two-storey block on the corner and a garage and shop next door on Molesworth Street. As well as space for the Society, it promised rental income to help defray costs. The NZSCE's problem was affording it, with only £1,000 in the bank.

Members at the conference offered to lend money. Their loans brought the Society's balance up to £2,850 which, along with a £5,000 mortgage, secured the building. Ownership transferred on 5 November 1920. After this, members were less willing to help pay off the mortgage (or dip into their pockets for other causes). Their lack of enthusiasm probably followed the decision to not move in until the mortgage was paid off.<sup>116</sup> Leases for Phoenix Service Station Limited and Post Office (later replaced by a bootmaker) were renewed.

Accommodation became unexpectedly urgent on Saturday 17 February 1923. Many members were in Auckland or travelling there for the annual conference when a fire took hold in Rounthwaite's office. The damage caused havoc for the Society, though it was insured.<sup>117</sup> This prompted the Secretary to take rented rooms in the Hood Brothers building, 112 Lambton Quay, and explains why no early files have survived.

The intention had been to build afresh on the Molesworth Street site, but by 1927 when the mortgage was paid off, rebuilding was shown to be "beyond financing"<sup>118</sup> and uncompetitive compared to other office space being built in city. So instead the Society decided in 1928 to occupy the four front rooms on the first floor and let the rear portion (three rooms, a bathroom and washhouse) as a flat. It took the address 54 Molesworth Street. The Society also started a building fund to help with future purchases of office accommodation, encouraging members to buy debentures.<sup>119</sup>



*Molesworth Street and surrounding area, Thorndon, Wellington [circa 1939].*

*Making New Zealand: Negatives and prints from the Making New Zealand Centennial collection. Ref: MNZ-1775-1/4-F Alexander Turnbull Library, Wellington, New Zealand. URL: <http://natlib.govt.nz/records/22870475>. The NZSCE building is opposite the Vauxhall building, left side of the image.*

The rooms were fitted out for a library/reading room, council room, committee meeting room, Secretary's office, store and lavatory. The library had textbooks and complete sets of *Proceedings* of several institutions.<sup>120</sup> Most of the early bequests and donations had been for library purposes or included sets of books.<sup>121</sup>

With this library, the Society promoted itself as a centre for engineering knowledge and excellence in New Zealand, and its collection would have been rivalled only perhaps by that of the PWD or Royal Society libraries.

The rooms were used to hold ICE and IMechE exams, and were let to bodies such as the Shakespeare Reading Club one night a week.

The Society was to enjoy this prime location for little more than a decade. Early in 1939 the Government decided to take this Molesworth Street property. A memo to members on 5 April recommended accepting the Government's offer. However, the newly renamed New Zealand Institution of Engineers (NZIE) "could not but deplore the loss of an incomparably good site".<sup>122</sup> It moved to a new address at 8–12 The Terrace, reopening there on 6 May with a seven-year lease.<sup>123</sup> This building was subsequently demolished to make way for the Reserve Bank of New Zealand building.

## PERCEPTION OF THE SOCIETY

As well as a centre for information and knowledge, the NZSCE gained a desire for expansion and glory. Francis MacLean said in 1922 that "When it became older, it would probably be a much greater power in the land than it was to-day".<sup>124</sup> By 1925 the Society felt its members



*NZSCE 1931 Conference, Auckland.*

*IPENZ Collection. In front row from the left are Alfred Baker, Frederick Jones, Frederick Kissel, George Murray and David Blair.*

were “playing a very active part in the development of the Dominion” as had engineers throughout the pioneering period.<sup>125</sup>

A continual growth in membership fed the Society’s prestige. From 100 members at the start of the First World War to over 200 by its end, the Society reached 400 in the 1920s. Each year brought many more applications (especially for Associate and Student membership), most of which were approved, and its total passed the 600 mark late in the 1930s. With volume came word of mouth and a critical mass of weight recognising the Society as the voice of all engineering in New Zealand, though more influential in some issues over others.

Commensurate with an increase in prestige came an increase in the Society’s annual subscriptions. They rose in 1924 to £4-4-0 for Members (a 33 per cent rise), £3-3-0 for Associate members (50 per cent up) and £2-2-0 for Students (100 per cent).<sup>126</sup> Membership lists left *Proceedings*, to be published separately in the 1930s.

Membership of the NZSCE allowed public figures another avenue through which to voice opinions. Frederick Jones (1874–1943) was stated specifically to be a member of the Society when speaking on that subject rather than as the Chairman of the Railway Board.<sup>127</sup>

As would be expected, the NZSCE entered into debates on the education of engineers, public works, the new discipline of town planning and, in the 1930s, earthquake-resistant construction and legislation. It helped local authorities select engineers, and to discuss conditions of employment for them.

Society sub-committees had considered the issue of standard fees for consultation, special engineering problems, and conditions of contract. The road construction industry looked

to the Society for its papers, reports and discussion on durable road surfaces, indicating that the Society was “in demand” in New Zealand.<sup>128</sup>

Mechanical engineer Harold Linter Cole (1880?–1953) replaced Richard Rounthwaite as Secretary in 1929 (Rounthwaite became the Society’s part-time librarian). A Scot who became Chief Mechanical Engineer of Indian Railways, Cole served with railway engineer troops during the First World War, rising in rank to Lieutenant-Colonel. He wrote on railways and after retiring from the Indian Railway Board brought his family to New Zealand in 1922. Cole would be the equally long-lasting NZSCE Secretary, serving for nearly 15 years.<sup>129</sup>

## ATTEMPTING ADVOCACY

In its early years, the Society protected the reputation of its members by rejecting below-par applicants, and by anonymously chastising those who transgressed professional or ethical codes. It rarely, however, went into bat for members in print. In the mid-1920s, the Society was concerned at how easy it was for a local body to sack its engineer or make him a scapegoat for failures, citing a case in Masterton. There, member Charles E Evans was successfully prosecuted for negligence in installing a septic tank and fined £70 plus costs. The Society considered appealing on his behalf but after investigating the matter, decided against doing so (and he remained a member for years).<sup>130</sup>

Later, in August 1927, Mount Albert Borough Council dismissed its resident engineer William H Cook. With 24 years’ experience, Cook was two years into this job, and felt his professional conduct and judgement was being constantly questioned and undermined. For example, when he proposed fixing a sewer for £436, the Council insisted he spend only £100. Cook’s site accommodation was also inadequate, working from a church which had to be cleared each Sunday. He complained of the Council’s “repeated interference” in his control of staff and labour.<sup>131</sup> When Cook refused to dismiss labourers who had voted against councillors, he was fired. The two councillors who supported him protested at “the unjust and un-British actions of the Mayor and Council”.<sup>132</sup> Cook did not get his job nor his health back, and worked for only another 18 months (in Dunedin) before returning to England where he soon died.<sup>133</sup>

Seemingly more about personality clashes and politics than an irresponsible engineer, much of this was aired in Auckland newspapers. The Society republished relevant stories, forwarding them to members for “information and guidance”. No commentary was made at all, merely noting that Cook was “a member of our Society”<sup>134</sup> and had been from the beginning. He was also among the first engineers to be registered.

Another case in Blenheim highlighted that the Municipal Corporations Act gave employees less protection than “an ordinary servant girl under the Masters and Servants Act”.<sup>135</sup> The Power Boards Act and Harbours Act also provided no uniformity to employing

engineers. The Society discussed the issue but members of the sub-committee appointed to look into it “found themselves up against a stone wall”, lacking power to change the law.<sup>136</sup>

A sub-committee also looked at the form of agreement an engineer might sign with their council but was unable to agree on a way forward. Local bodies were not subject to the Master and Apprentices Act, which stipulated minimum payments to be made upon severance. This then became yet another area in which the Society needed to create reform.<sup>137</sup>

### WHAT’S IN A NAME? EARLY DEBATES

The bigger issue remained the status of engineers. Saying even drain-layers had status, the Society felt that engineers “had allowed themselves to be walked over in the past”.<sup>138</sup> Their status needed improving.

The name of the Society, particularly the word “Civil”, was linked in some minds to a poor perception of engineers. This was discussed at the 1927 conference.<sup>139</sup> Some treated it with levity, repeating the joke about the civil engineers who “were generally uncivil”.<sup>140</sup> The NZSCE Council was tasked with considering the matter.

Electrical and mechanical engineers (most were also MIEE and MIMechE) felt the name did not reflect their area of specialisation. They formed a sub-committee and argued for change, but the Council opposed them. The sub-committee failed to get a special meeting convened (requiring a petition of at least 20 members and at least 28 days’ notice) but it was able to get the matter raised again at the 1928 conference. Significantly, it drew attention to the growing strength of bodies outside the Society representing those specialist sub-groups, such as the Electric Supply Authority Engineers’ Association of New Zealand (ESAEANZ). This body now “occupied a very prominent position, and one which this society might have occupied if sufficient support had been given to the electrical engineers”.<sup>141</sup> Their bravado was enhanced by the appearance in 1928 of the *New Zealand Electrical Journal*, by Technical Publications Limited.

Electrical engineer Frederick Kissel (1881–1962) said active and young mechanical and electrical engineers had “a feeling of antagonism towards the Society, and New Zealand was not a sufficiently big country to have a split among its engineers”.<sup>142</sup> These younger engineers “objected to being classified among the civil engineers”.<sup>143</sup> Kissel said of 200 registered electrical engineers in New Zealand (the current membership of ESAEANZ), only 70 were members of the NZSCE.

This implied a threat to “withdraw from the Society” if the name did not change.<sup>144</sup> Supporting this was the analogy that the IEE and IMechE had formed in the United Kingdom because ICE no longer covered their specialisms. This was appropriate to New Zealand because most wanted the Society to represent all three disciplines. They rejected the word “Civil” for not being inclusive.<sup>145</sup>

Were aeronautical engineers to be included, or architectural, marine, structural, consulting or radio engineers? Would the word “Engineering” be better than “Engineers”?<sup>146</sup>

The Council spuriously pointed out that a name change would entail alteration to the Acts of Parliament which referred to the Society by name. This was disputed by a legal opinion that under the Acts Interpretation Act 1924, a successor name was acceptable.<sup>147</sup> The Council feared that a name change may give Parliament an excuse to modify the hard-won engineers’ registration legislation, knowing for instance that the surveyors were lobbying to amend the Act “in quite a bad way”.<sup>148</sup>

The debate was about status and perception more than a mere label. Frederick Furkert stressed the need to not look like a trades union, and not admit the likes of motor-men (tram drivers) or “the man who mended a lawn mower”.<sup>149</sup> Others said the term “Professional” might cut out the experienced engineer who did not have qualifications. The name needed to reflect a body of professionals with scientific purpose. Some felt “Society” or “Association” did not carry the gravitas of “Institution” (which itself was taken to be far superior to “Institute”). But “Institution” might “ape the older Institutions”.<sup>150</sup>

The Council made its opinion well known to members, which “no doubt influenced the result” of a referendum on it at the 1928 conference.<sup>151</sup> Two to one voted against a change.

However, this debate planted the seed of change.<sup>152</sup> Part of this debate revealed an “us-versus-them” stance between the Council and members. Elder statesmen faced off, Robert Holmes hinting that the Council should not have offered its opinion on the name, adding it should be fulfilling the wishes of, rather than directing, the Society.<sup>153</sup> Francis MacLean said that lobbying for change “was tantamount to expressing want of confidence in the Council”.<sup>154</sup> Furkert inferred that Kissel “had attacked members of the Council for dilatoriness”. Kissel admitted “attacking the policy”, not individuals.<sup>155</sup> While the Council restricted criticism of its domestic work, others said it should not fear democracy or debate in the branch meetings.

Some become sick of navel gazing. Elsewhere, “Civil” was also seen as exclusive of other disciplines.<sup>156</sup> In the 1930s the Society’s name sometimes appeared without the word “Civil”.<sup>157</sup>

The sub-committee eventually suggested minor changes to encourage more electrical and mechanical engineers. A Special General Meeting (SGM) in February 1930 agreed to make less of the distinctions between members, of which qualifications they had, other bodies they belonged to, or whether in public service or private practice. An electrical section was created to encourage papers on that topic.<sup>158</sup>

The logic for change simmered, only coming to a boil in 1937.

### BENEVOLENCE

The Benevolent Fund created in 1914 was to assist members in need. Such funds were common among professional associations in an age when state welfare did not exist; ICE had one and IMechE started its own in 1906.<sup>159</sup>

While the NZSCE pondered how the fund was to be used, it was invested. Only income would be spent but the four per cent interest added only £8-8-8 in the first year.<sup>160</sup>

Initially, the fund was to provide financial support for members, widows or dependents “in distress due to sickness, accident or other misfortune”.<sup>161</sup> Later recipients had also to be members of the Society.<sup>162</sup>

As in other ways, the First World War interrupted further moves. The Benevolent Association would run the fund but was not formed until 1920.<sup>163</sup> The Association adopted the Society’s Rules and the Society’s Council became its management committee.<sup>164</sup>

Despite the close ties with the Society, the Association was separate, with a separate subscription rate of 10s. Joining was voluntary but fewer than expected did so. A lack of enthusiasm from dry luminaries such as Sydney Mair did not help.<sup>165</sup>

The First World War produced demands far outstripping available monies.<sup>166</sup> The repression of the early 1920s might also have increased applicants, but details were not reported. On the contrary, all were treated “in the strictest confidence”, so that members would not learn of a colleague’s plight.<sup>167</sup> At its first AGM in 1921, the Association considered paying the Society’s subscriptions for war veterans who struggled upon returning to civilian life. Only three members were in this category and one of them said he “felt rather hurt” to have been offered charity.<sup>168</sup>

Ten years later the Association complained that “ridiculously small” numbers (of the 450 members) contributed to the fund.<sup>169</sup> A life membership of £10-10 attracted only one taker.<sup>170</sup>

The Benevolent Association invested in the Society’s building fund, buying debentures on its Molesworth Street property. Not surprisingly, Society members now regarded the building and the Benevolent Fund as one and the same. This was a risky policy which the ups-and-downs of property investment in the 1920s and 1930s showed to be unwise. That the Benevolent Fund had risen to £1,900 in 1935 is probably only due to ongoing injections of capital by donors such as William Ferguson’s estate (£100 in August 1936).<sup>171</sup> With little income, it offered little succour.

The advent of more generous social security in the late 1930s reduced the perceived need for benevolence. Attempts were made to wind it up, without success. Its funds continued to rise slowly (to \$23,000 in the late 1960s) but few “calls upon it” were successful.<sup>172</sup>



*James Watt bicentenary celebration dinner, Wellington, 1936.*

*IPENZ Collection. John Cull is sitting side-on in the centre.*

## NEW ZEALAND ENGINEERING AND THE SOCIETY'S HISTORY

After its first decade, the NZSCE felt history had been made and some members turned amateur historian to document it. Robert Holmes reviewed New Zealand public works since 1870 and Francis Maclean showed how engineering helped develop New Zealand.<sup>173</sup> The prevailing view that engineering had changed the face of the planet and of humankind encouraged members to see their efforts as historic. They were also aware that history is easily lost, the case of two early marine engineers being cited. James Melville Balfour (1831–1869), author Robert Louis Stephenson's (1850–1894) uncle, was Otago province's first marine engineer. He drowned while going to the funeral of another engineer, Thomas Paterson (1830–1869), who himself had also drowned, in the Kakanui River.<sup>174</sup>

Such pioneer stories had the drama of the frontier. After the War a proposal arose to produce an engineering history of New Zealand. No one took up this project as a record of the works themselves but members were invited to write what they knew of early engineers and former members. This started a list of memoirs published occasionally in *Proceedings*. Over the years these coalesced into a biographical collection that Frederick Furkert worked into a manuscript, published posthumously in 1953 as *Early New Zealand Engineers*.<sup>175</sup>

The Society was centrally involved in several anniversaries, both in New Zealand and the United Kingdom: electrical engineer Michael Faraday's (1791–1867) in 1931;<sup>176</sup> the steam pioneer Richard Trevithick's (1771–1833) in 1932;<sup>177</sup> and in 1936 the bicentenary of mechanical engineer James Watt (1736–1819).<sup>178</sup> The Society also joined the Newcomen Society for the Study of the History of Engineering and Technology in 1934.<sup>179</sup>

In 1935, a NZSCE history was published. Called *Retrospect*, it was occasioned by the Society's coming-of-age, turning 21 years. It was written from recollections of members "fully

qualified by first-hand knowledge”. It regarded the period covered “as of very considerable importance in the history of the Engineering Profession in New Zealand” though it glossed over the animosity with the surveyors and made light of lobbying failures.<sup>180</sup> MacLean was thanked for his role preparing the volume.<sup>181</sup> Seven hundred copies were printed and delivered in January 1936. Secretary Harold Cole updated an earlier index of *Proceedings*.<sup>182</sup> Both men were presented with bound editions. The 1935 history sold for 2-6d, whereas *Proceedings* sold for 10-6d.

However, any measurements of history and conclusions on the significance of achievements came to a stop in 1939 when New Zealand became embroiled in its second world war within a generation.

## ENDNOTES

- 77 McRae, *New Zealand Institute of Surveyors*, 334.
- 78 ‘Local bodies control of engineers,’ *Evening Post*, 8 July 1919, 8.
- 79 This confusion is seen in debates right until the act was passed, including by Mr Moore, a member of the Legislative Council, who said when debating the Bill “[T]he Board will have the right of admitting or rejecting any one who may wish to become members of the Engineers Association [sic, Society].” *NZPD*, vol.204, 24 September 1924, 1095.
- 80 Sec NZIS to Surveyor-General, copied to NZSCE, 5 November 1921. NZSCE pamphlet ‘In Re Proposed Legislation (Engineers’ Registration Bill)’ 10 December 1921. IPENZ Collection. This was one of a series of circulars NZSCE published and distributed documenting the discussions.
- 81 *Procs NZSCE 1914-15*, 19.
- 82 ‘Civil Engineers annual conference opened at variance with surveyors,’ *Evening Post*, 21 February 1922, 7.
- 83 Ibid.
- 84 McRae, *New Zealand Institute of Surveyors*, 333, uses this word in the context of 1916 when the surveyors saw the draft Local Authorities Engineers Bill.
- 85 *Surveyors Journal*, June 1922, cited in McRae, *New Zealand Institute of Surveyors*, 342.
- 86 ‘Surveyors’ work,’ *Evening Post*, 30 August 1922, 9.
- 87 *Procs NZSCE 1921-22*, 28.
- 88 ‘Surveyors’ work,’ *Evening Post*.
- 89 ‘Registration Required,’ *Auckland Star*, 22 February 1923, 10.
- 90 *Surveyors Journal* editorial, December 1921, quoted in McRae, *New Zealand Institute of Surveyors*, 337.
- 91 Secretary to Members, ‘In Re Engineers’ Registration,’ 6 September 1922, IPENZ Collection.
- 92 ‘Registration of Engineers,’ *Evening Post*, 21 August 1923, 5.
- 93 The words are Christchurch Mayor and Member of Parliament HTJ Thacker’s in welcoming Coates to the Society’s conference in 1921. *Procs NZSCE 1920-21*, 19-20.
- 94 *Procs NZSCE 1924-25*, 30. This is presumed to be the Government’s objection to some provisions which “were overcome by modification”. *NZSCE History 1914-1935*, 24.
- 95 *Procs NZSCE 1919-20*, 24.
- 96 *Procs NZSCE 1924-25*, 30.
- 97 ‘Registration of Engineers,’ *Evening Post*.
- 98 *NZPD*, vol.204, 26 August 1924, 402. Electrical engineers had a similar failure after power boards started hiring non-qualified people. Henry Toogood, NZSCE member and the inaugural President of the Electric Supply Authority Engineers’ Association (formed in 1925), wanted the same restriction imposed on local power boards but got the same response from Government – an Electrical Wiremen’s Registration Act 1925. *Evening Post*, 14 August 1925, 7. See also *Evening Post*, 26 March 1924, 9. *Evening Post*, 6 August 1925, 6. Neil Rennie, *Power to the People – 100 Years of Public Electricity Supply in New Zealand* (Wellington: ESANZ, 1989), 141.
- 99 New Zealand Parliament, ‘An Act to make provision for the Registration of Engineers,’ *New Zealand Statutes*, 1924, section 8(2). Available from Early New Zealand Statues, URL: <http://www.enzs.auckland.ac.nz/>.
- 100 Ibid, section 6(2).
- 101 Ibid, section 11. A right of appeal asked for by Bill Jordan was not added. *NZPD*, vol. 204, 399.
- 102 *Procs NZSCE 1925-26*, 47.
- 103 *NZPD*, vol. 204, 401.
- 104 The Act continued to refer to the NZSCE for 40 years after it changed its name to the New Zealand Institution of Engineers.
- 105 The Society’s nominees were MacLean (civil engineer Wellington, previously Chief Engineer, New Zealand Railways, and past NZSCE President), Matthew Cable (electrical engineer to the Wellington City Council) and David Blair (mechanical engineer, Wellington). The other three inaugural appointees were also all NZSCE members: Furkert (Engineer-in-Chief and

- Undersecretary of the Public Works Department, past NZSCE President, elected inaugural chair) Frederick Kissel (Chief Electrical Engineer, Public Works Department) and Mair (engineer to the Rangitikei County Council). All were Wellington-based except Mair, who commuted from Hunterville. William Newnham of the Public Works Department's head office staff became the first Registrar of Engineers, but later was appointed to the Board and chaired it for many terms. EE Hendriksen was later a long-term Registrar.
- 106 *New Zealand Gazette*, 25 June 1925, 1965. Additional regulations relating to appeals, were gazetted on 12 November 1925, 3162, and 14 October 1926, 2905.
- 107 *New Zealand Gazette*, 2 September 1926, 2643. 'Engineers Registration Board Register' n.d [Book 1, 1925-51], IPENZ Collection. Subsequent Registers cover the period from 1951 to 1996. The Qualification for Registration column by each name recorded: Section 61(a) recognised qualification, (b) passed the examination or (c) or six or more years of experience. The Register recorded new qualifications or letters, the deaths of its engineers and if they were struck off.
- 108 McRae, *New Zealand Institute of Surveyors*, 351.
- 109 *NZPD*, vol.218, 29 August 1928, 640.
- 110 New Zealand Parliament, 'An Act to amend the Engineers Registration Act, 1924,' *New Zealand Statutes*, 1928, section 2(1). Available from Early New Zealand Statues, URL: <http://www.enzs.auckland.ac.nz>.
- 111 *Evening Post*, 28 August 1929, 15; *NZPD*, vol.218, 639.
- 112 *NZPD*, vol.218, 640.
- 113 *New Zealand Gazette*, 29 September 1927, 2932.
- 114 *New Zealand Gazette*, 3 October 1929, 2572.
- 115 *Procs NZSCE 1919-20*, 7. A site near the Town Hall was almost secured.
- 116 *Procs NZSCE 1921-22*, 26.
- 117 The Secretary telegraphed the conference with news of the fire. *Procs NZSCE IX 1922-23*, 26. 'Serious Damage,' *Evening Post*, 19 February 1923, 8. The Egypt Exploration Society in the same building lost its entire library.
- 118 *Procs NZSCE 1927-28*, 30.
- 119 *NZSCE History 1914-1935*, 18.
- 120 The library then included *Proceedings* of the parent civil, mechanical and electrical engineers institutions, as well as of the Institute of Municipal Engineers, Institution of County Engineers (both United Kingdom organisations) and American Society of Civil Engineers. *Proceedings* were exchanged with the Institution of Structural Engineers and Engineering Institutes of Australia, India, Punjab, Ceylon, Malaya, South Africa and Canada.
- 121 These included Richard Holmes Library Trust (£100), James Fulton Bequest (£250 plus books donated by his widow), William Carruthers (a set of ICE *Proceedings*) and William Ferguson Bequest (£100 plus books).
- 122 *Procs NZIE 1938-39*, 22.
- 123 Executive Committee (EC), 5 May 1939; Secretary's Report (SR) 26 May 1939.
- 124 'Civil Engineers annual conference opened at variance with surveyors.'
- 125 *Procs NZSCE 1925-26*, 25.
- 126 *Procs NZSCE 1923-24*, 29. Life membership at £21 did not change.
- 127 'Engineering,' *Evening Post*, 31 July 1925, 7.
- 128 *NZSCE History 1914-1935*, 28.
- 129 Newnham, *Learning Service Achievement*, 327. As librarian, Rounthwaite earned £13 per month. *Procs NZSCE 1929-30*, 48.
- 130 *Procs NZSCE 1923-24*, 31. 'Alleged Neglect,' *Evening Post*, 1 February 1924, 3. 'Negligent Supervision,' *Evening Post*, 14 February 1924, 5.
- 131 *The Sun*, Auckland, 17 Sept 1927.
- 132 Cr WG Russell, *NZ Herald*, 20 Sept 1927.
- 133 'Memoir' *Procs 1932-33*, 366. This obituary published by the Society made no mention of Cook's battle in Mount Albert, a sign perhaps of divided opinion over his culpability or lesser support for him because he was an engineer registered under 'Section 6(1)b' – without qualification.
- 134 NZSCE to Members, 7 October 1927, 16pp reprinted newspaper articles. 'Misc History' box, IPENZ Coll.
- 135 *Procs NZSCE 1924-25*, 40. The act was the Master and Apprentice Act 1865, amended in 1920. In the case WT Mansfield (not a member of the Society) was dismissed as City Engineer without cause and lost his wrongful-dismissal appeal (for which a member JM Morice gave evidence) based on the interpretation that under the Municipal Corporations Act a local authority has only to pass a motion to instantly dismiss any employee. 'Non-suited,' *Northern Advocate*, 22 June 1922, 5. Mansfield had been engaged for two years from late 1919 and was investigating the costly hydro electric options for the Council. 'Water and Sewerage,' *Marlborough Express*, 15 August 1919, 2.
- 136 *Procs NZSCE 1925-26*, 54.
- 137 *Ibid*, 53. The sub-committee had been formed in 1925.
- 138 *Procs NZSCE 1919-20*, 24.
- 139 *NZSCE History 1914-1935*, 17. A report on the discussion about the Society's name was published in *Procs NZSCE 1927-28*, 30-67.
- 140 Christchurch Mayor JK Archer welcoming delegates to the 1929 conference. *Procs NZSCE 1928-29*, 27.
- 141 Henry Toogood, member of both organisations. *Ibid.*, 40. The Association later became an Institute, and is now (2013) the Electricity Engineers Association of New Zealand. It started as a section of the Power Boards Association of New Zealand.
- 142 *Ibid.*, 33. Kissel cited the Institute of Engineers Australia, the American Engineering Foundation and Engineering Institute of Canada, as cases where the word "civil" was dropped (the latter in 1918 after 31 years as the Canadian Society of Civil Engineers).
- 143 *Ibid*.

## AN EVOLVING ORDER

- 144 Hugh Vickerman, *ibid.* 38.  
145 *Ibid.*, 34.  
146 *Ibid.*, 44.  
147 *Ibid.*, 35, 41. The Engineers Registration Act, Town Planning Act and Health Act recognised the Society as the body nominating engineers to their respective boards.  
148 Furkert, *ibid.*, 41.  
149 *Ibid.*, 49.  
150 Ferguson to NZSCE, 26 July 1927, cited by MacLean, *ibid.*, 61. "Institute" was perceived as old-fashioned, with the New Zealand Institute dropping the word in 1933 in favour of the Royal Society of New Zealand (having formed from regional research and philosophical bodies in 1867).  
151 Circular on 'Proposed Name Change', 15 April 1937, Minute Book 1936-37, IPENZ Collection.  
152 *Procs NZSCE 1927-28*, 48.  
153 *Ibid.*, 50.  
154 *Ibid.*, 65.  
155 *Ibid.*, 42.  
156 *NZPD*, 24 September 1924, vol.204, 1095.  
157 A booklet published during the James Watt bicentenary talked of the New Zealand 'Engineering Societies' gathering for the commemoration hosted by the "New Zealand Society of Engineers". *The James Watt Bi-Centenary Commemorative Volume* (Wellington: Technical Publications, 1936), 9, 11.  
158 *Procs NZSCE 1929-30*, 61.  
159 RH Parsons, *History of the Institution of Mechanical Engineers 1847-1947* (London: Institution of Mechanical Engineers, 1947), 43, 46. The IMechE Benevolent Fund was incorporated in 1913.  
160 *NZSCE History 1914-1935*, 29.  
161 'Report of the Committee of Management of the Benevolent Association for Year Ending 31 December 1942', 17. Archives New Zealand (ANZ), Registrar of Companies file 1920/9, AAWF w4159 box14 item 1911.  
162 Newnham, *Learning Service Achievement*, 363.  
163 'The Benevolent Association of the New Zealand Society of Civil Engineers, Incorporated', Registered No 1397, 1 June 1920. ANZ, AAWF w4159 box14, item 1911.  
164 *Procs NZSCE 1919-20*, 76. Ferguson, Ashley Hunter and Lawrence Birks became the first Trustees, with Furkert as Honorary Secretary and James Marchbanks as Honorary Treasurer. The Association published its own rules in 1938. *Procs NZIE 1937-38* (part 1), 250.  
165 *Procs NZSCE 1918-19*, 16.  
166 Newnham, *Learning Service Achievement*, 25. *Procs NZSCE, 1914-15*, 14.  
167 *NZSCE History 1914-1935*, 29.  
168 'Benevolent Association-First AGM', *Procs NZSCE 1920-21*, 105. That member did eventually pay his own subscription.  
169 *Procs NZSCE 1929-30*, 36. The following year saw no increase in support. *Procs NZSCE 1930-31*, 40.  
170 Supplement to *New Zealand Engineering*, 30:4 (April 1975), 3. In 2013 this sum was equivalent to approximately \$4,500.  
171 *NZSCE History 1914-1935*, 29.  
172 Newnham, *Learning Service Achievement*, 363.  
173 *Procs NZSCE 1916-17*, 26.  
174 *Procs NZSCE 1919-20*, 16. Furkert, *Early New Zealand Engineers*, 104, 240.  
175 *Procs NZSCE 1919-20*, 14. Furkert worked on the book fulltime from 1947 until his death on 26 September 1949, after which Newnham completed it.  
176 The Faraday celebrations commemorated the centenary of his successful demonstration of the principle of electromagnetic induction. Rollo Appleyard, *The History of the Institution of Electrical Engineers (1871-1931)* (London: Institution of Electrical Engineers, 1939), 16. Newnham, *Learning Service Achievement*, 34. *Procs NZSCE 1931-32*, 62. *Procs NZSCE 1938-39*, 212. *New Zealand Institution of Engineers 50 Year Index of Publications* (Wellington: NZIE, 1964).  
177 *Procs NZSCE 1932-33*, 33.  
178 *The James Watt Bi-Centenary Commemorative Volume*, 40. EC Minutes, 31 October 1934, 4. Although the New Zealand Manufacturer's Federation and Ironmasters' Federation were not interested, the Royal Society of New Zealand, New Zealand Institute of Power and Marine Engineers, ESASANZ and even the Wellington Model Engineering Society joined celebrations. Newnham, *Learning Service Achievement*, 38. *Procs NZSCE 1935-36*, 14, 54. Council Minutes, 21 February 1936, 2. IPENZ Collection. *The James Watt Bi-Centenary Commemorative Volume*, 42. The Governor-General was also invited to open the joint conference, but could not, and the Prime Minister was also unable to attend. Joint Committee Minutes 17 December 1935, 2. IPENZ Collection.  
179 Council Minutes, 19 February 1934.  
180 *NZSCE History 1914-1935*, 3.  
181 *Procs NZSCE 1935-36*, 28. EC Minutes, 28 August 1935.  
182 The first 10 volumes of *Proceedings* were indexed in 1925, Vols XI to XX in 1935. *Procs NZSCE 1924-25*, 261.

## CHAPTER 3

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# 1930s

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### **A RECURRING ISSUE: THE STATUS OF ENGINEERS**

One thing hurting the status of engineers was the PWD assisting local councils without charging. It was a downwards spiral: by giving free service the PWD undermined the value of municipal and private engineers, which in turn kept down salaries and perceptions of worth, and which ultimately undermined the government sector engineers.

Consulting engineers employed by some councils to plan, design and oversee works felt most threatened by this. One council might commission a consulting engineer whereas the neighbouring council could use the PWD service and pay nothing. In 1930 a “little coterie” of consulting engineers threatened to form an association of their own.<sup>183</sup> Though this was unsuccessful, it prompted the Society to act.

First, the Society tried to get the PWD to stop the practice by approaching the Minister on the sly (a member had “heard it said — though it had not been reported”).<sup>184</sup> Senior member Frederick Furkert had been the PWD’s Chief Engineer for the past decade and did not explain why he had failed to stamp the practice out.

Establishing a standard scale of fees for engineers would achieve the same end. Engineers in local or central government got a salary based on a fair comparison with others, but the Department’s freebies to councils made income for consultants unpredictable. This had an impact on the status of the profession.

Henry Toogood (1879–1962) aired this issue at the 1930 conference, and had to make it clear he was not attacking members such as Furkert. He nonetheless charged that some local government engineering work was being “monopolised” by the Public Works and other departments and that this was bad for the overall profession.<sup>185</sup>

The Society knew “there was nothing so mixed up with politics in this country as engineering”.<sup>186</sup> They joked that only by entering politics could they change the system from

the inside. Instead, a Status of the Profession Committee was formed under Toogood to look into it.

The Committee reported that a model scale of fees was necessary and drafted one after studying those used in Australia and the United States.<sup>187</sup> Simply stated, the PWD should charge for their service. Substandard work should be put back on the council for improvement. Charges would be levied for preparation time, additional costs and large projects (on a commission basis). The proposed commission was five per cent for projects over £35,000, increasing to 7.5 per cent for those under £5,000.

This scale was published in mid-1931. It was graphed and compared with other commissions (including the architects’): its proposals were the lowest.<sup>188</sup> The 1931 conference went into committee on it, such was the sensitivity. Copies were sent to the Royal Commission on National Expenditure, which reported that “where the department undertakes services for local authorities, charges be made...”.<sup>189</sup> The Prime Minister George Forbes (1869–1947) refused to receive the Society’s deputation, which then asked him to adopt the Royal Commission proposal.

The Committee also proposed a form of agreement that engineers should prepare with their clients, but was unable to agree on the details.<sup>190</sup>

Progress on changing departmental practice was slow, but was achieved through an unexpected channel. When John Wood (1880–1952) became Engineer-in-Chief in 1936, he recommended the Society’s proposal be adopted “almost in toto”.<sup>191</sup> Not only would future work carried out by registered engineers be charged, but it would be at the rates suggested by the Society. A third point was a “discrimination” applied to some county councils, with work done by them for the Main Highways Board and PWD attracting only three per cent.<sup>192</sup>

This recognition of the worth of the engineers employed or contracted by councils contributed to raising the status of the profession. A moral obligation had been placed upon employers. When the 1937 conference heard this news, members broke into applause.

With this victory under its belt, the sub-committee could have disbanded. However, it stayed on to amend the Engineers Registration Act – that no public money be spent on public works unless under a registered engineer.<sup>193</sup>

## ENGINEERING EDUCATION AND QUALIFICATIONS

Engineering education arose slowly in the wake of settlement. Canterbury College opened in 1873, but its School of Technical Science offered only artisan training. Funds were perennially short; budgetary battles were between “blacksmiths and books”.<sup>194</sup> Schools of Mines had been formed in Auckland and Otago but they were a poor platform for broad engineering education.

When it became clear that the future was going to be a technical one, Canterbury College formed a School of Engineering. The former Canterbury Provincial Engineer

Edward Dobson (1816–1908) developed its courses which in 1893 started the Bachelor of Science (BSc) (Engineer) degree in all three disciplines of engineering (civil, mechanical and electrical). It also taught night classes for artisan and third-class marine engineer certificates and apprentices.

By then, the School was under the “Academic Admiral” or “God Professor” Robert Julian Scott (1861–1930), cousin to Antarctic explorer Robert Falcon Scott (1868–1912), who ran it in a quarter-deck manner until 1922.<sup>195</sup>

The Canterbury degree was acknowledged as of the highest standard, being the only such course abroad (other than McGill University in Australia) recognised by ICE.<sup>196</sup> A second School of Engineering formed at Auckland University College in the 1920s, but its courses were not initially recognised by the University of New Zealand.<sup>197</sup>

One of the NZSCE’s focuses was on how education could best serve the profession. It formed an Education Committee in 1933. Under Toogood, it lobbied to achieve a “better alignment” of education and practice.<sup>198</sup> The Committee emphasised the need for secondary education to prepare the students before entering university.<sup>199</sup>

Toogood said the Society “had done good work in bringing the matter before the teaching profession” but now it would be up to the Senate of the University of New Zealand to accept their proposals. The Society felt it could make mature comments on education because it represented both consumers of education and employers of engineers. The Senate received the Committee’s recommendations “with considerable interest”<sup>200</sup> and referred them to its Board of Studies and the various colleges.

The Society “wanted to see the men emerging from the School of Engineering a long way better equipped than those who had preceded them, and fully able to take their positions in the community as engineers — not only as technical men but as professional men prepared to solve the many problems requiring solution in the hands of the modern engineer”.<sup>201</sup> Professor of Civil Engineering at Canterbury College, John Cull (1879–1943), talked of educating people, not the machine in them, looking to the future of engineers as leaders. An engineer need not be a mathematical genius, but if “his character is weak, . . . refuse to let him go to Civil Engineering”.<sup>202</sup>

Education was complicated because it was not just New Zealand standards that had to be met, but also those set by ICE. These were still the benchmark for engineering in New Zealand, including the ERB.

With a promising reception by the Senate, the NZIE hosted the Conference on the Education of Engineers in September 1937 (its first event after formally changing name).<sup>203</sup> The proposals, however, were not adopted. The Board of Studies balked at introducing subjects that required new lecturing positions in three colleges (including Wellington).

Over the next few months “a deadlock” was reached and Toogood said the Committee was “not going to get any farther with the University of New Zealand. The work of four years

had gone for nothing unless they were prepared to undertake an active public campaign.”<sup>204</sup> Cull said Toogood’s pessimism was unwarranted because some of the Committee’s lesser recommendations had been adopted and “put into effect in the new syllabus for civil engineering.”<sup>205</sup>

### EARTHQUAKE ENGINEERING

An earthquake shook Murchison in 1929 but it was not until the huge loss of life from the 1931 Hawke’s Bay earthquake that thought turned to seismic engineering.<sup>206</sup>

Toogood arrived there within 24 hours and witnessed “the horrors of the scenes.”<sup>207</sup> He immediately informed the Society’s Council that an enquiry was essential, adding “the prevention of serious loss of life... lay more in the hands of engineers than in those of builders or architects”. The Council had a letter handed to the Minister of Public Works, William Burgoyne Taverner (1879–1958), on his tour of inspection urging the study of damage from an engineering and architectural standpoint “before the evidence was destroyed”.<sup>208</sup>

The Society repeated its calls during its annual meeting a fortnight later in Auckland. It also offered to provide qualified members to “devise suitable bye-laws covering erection of structures particularly in any locality liable to earthquakes.”<sup>209</sup> Members were “given food for thought” about relief and the tragedy when safety margins fail. As well as offering general assistance, as a gesture the conference curtailed its social functions and some of its site visits.<sup>210</sup>

More substantial thinking went into building standards. After Murchison, the NZIA had set up a sub-committee to look at earthquake resistance in houses and the engineers now said they should do the same.<sup>211</sup> Instead, the Government set up a Committee of Inquiry into the Hawke’s Bay earthquake. It would look at whether better building regulations could improve people’s chances of survival.

Cull led the inquiry.<sup>212</sup> Six of the 13 others on the Committee were NZSCE members: Robert Campbell (1881–1955), Christchurch structural engineer; George Hart (1870?–1948), Wellington’s City Engineer; Alexander Stewart Mitchell (1882?–1952), Wellington architect and engineer; William Langston Newnham (1888–1974), PWD designing engineer; Eric Houghton Rhodes (1889–1967), Auckland structural engineer; and Hugh Vickerman (1880–1960), Wellington civil engineer.<sup>213</sup>

After three months, the Committee’s conclusions were embodied in a draft general earthquake bylaw. This covered design, workmanship and inspection during construction, and set out “minimum standards which should govern all construction in New Zealand, and requires that all new buildings shall be designed to withstand a horizontal acceleration equal to one-tenth of the acceleration due to gravity”. Local authorities should incorporate “this general earthquake by-law” in their own bylaws and demand a higher standard of construction.<sup>214</sup>

The committee's work fed into a Building Construction Bill put up by government. Very simple legislation, it enabled local authorities "to compel the erection of such buildings as would be able to withstand the effects of earthquake shock".<sup>215</sup> The Society publicly urged its passing on several occasions.<sup>216</sup> Possibly naively, members thought that earthquake strengthening would not cost much, perhaps two per cent above normal building costs. The Bill dragged on.

The Society was firmly of the view that building construction bylaws should be compulsory.<sup>217</sup> The Hawke's Bay tragedy could have helped the Government turn local authorities away from permissive *laissez-faire* to regimes imposing minimum engineering standards.

While the Cull Committee and the Government deliberated on building regulations, the Society quietly got on with the technical side of earthquake engineering. Branch and annual meetings bubbled with talk. Frederick Furkert said they should not "delay an hour".<sup>218</sup> The first paper was presented at the 1931 conference a fortnight after the disaster. The author, JR Baird, Assistant Borough Engineer in Hamilton, said that New Zealand was building "potentially greater disasters.... To build our homes and cities with no regard to such [seismic] forces is nothing short of an elaborate preparation for suicide."<sup>219</sup>

They pondered how to strengthen buildings and remove embellishments which could fall off.<sup>220</sup> The rigidity approach was canvassed (making the building so strong it moves with the quake but is not damaged by it). Baird suggested placing a building on a frictionless foundation, anticipating the base-isolation method developed in New Zealand several decades later. He said too little was known about the forces acting in an earthquake and how buildings responded.

Two years later, consulting structural engineer Peter Holgate (1886–1959) incorporated the latest seismic research from the United States and Japan (the latter translated by The University of Auckland). He assured members that Japanese methods of combining structural steel and reinforced concrete would produce earthquake-resistant buildings. He restored confidence in framed construction and reinforced concrete. This was while the Wellington Railway Station, designed before the Hawke's Bay earthquake, was under construction using steel framing. Holgate had worked on that project, testing its reinforced brick panels in simulated shakes. His paper won the Fulton Gold Medal that year. The response to his paper was almost euphoric, restoring confidence to a sector whose basic beliefs had been shaken.<sup>221</sup> Members of the Building Regulation Committee including Cull heard Holgate's paper, and were gratified by his reassurances about reinforced concrete. Cull "thought the engineers who visited Hawke's Bay and saw the result of the damage done there felt somewhat afraid of the use of reinforced concrete".<sup>222</sup>

In Parliament, the Society's efforts suffered "deadly inertia".<sup>223</sup> At the 1934 conference, members criticised the Government for a lack of progress on the model bylaw, while saying

“that it is the function of local bodies to see that the buildings within their districts are safe, for they have capable engineers in their employ”.<sup>224</sup>

Meanwhile, the Building Construction Bill had hit snags. “[V]ested interests had gathered force and oppose[d] its enactment”,<sup>225</sup> though emergency regulations did embody a few earthquake provisions. Some blamed architects but their Institute (and others) joined the Society in lobbying for this Bill.<sup>226</sup> The most powerful opposition came from “certain municipalities; an opposition engendered by an unwarranted fear of PWD dominance, and a desire to control their own building regulations”.<sup>227</sup> Despite promises by Prime Minister Forbes, the Bill did not become law.

The Society saw Hawke’s Bay’s situation as a watershed moment, an opportunity to move the structural engineer closer to the core in designing buildings, which for “far too long” had been left to architects. It could be “a great occasion when the Society could be of considerable use”.<sup>228</sup>

Earthquake engineering is all about standards. The regulations proposed by the Cull Committee became the basis for a Code of Building Bylaws later published by the New Zealand Standards Institute (NZSI).

In urging local bylaws, municipal engineer Augustus Galbraith (d.1957) said “most of the existing buildings... were quite incapable of withstanding a violent earthquake. Directly after a shock occurred people would rush out into the streets and would be caught by debris from the walls and suspended verandas.”<sup>229</sup> He was talking about Christchurch.

## STANDARDISATION

Today we take standardisation for granted. Mass manufacturing has made it the norm in swappable car parts, consumables or plugs and sockets. However, in the early- to mid-20th century, this level of standardisation was unknown and this inhibited trade.

A short-lived New Zealand Committee of the British Engineering Standards Association was formed, with Eugene Desire Cachemaille (1873–1952) as its Secretary.<sup>230</sup> By 1922, the Committee found “that there is not much interest taken in its work” and had little to do, with most users dealing directly with the British body.<sup>231</sup>

In 1925, the NZSCE urged the formation of a New Zealand Bureau of Standards.<sup>232</sup> The impetus that induced its birth was the visit in 1932 by Charles le Maistre (1874–1953), Director of the British Standards Institute.<sup>233</sup> He advocated standards as a way of enhancing trade.<sup>234</sup>

Both had to overcome a negative perception of standardisation acquired through the 1931 “cheddarisation” of cheese, a crisis which led some exporters to believe their products’ quality had been lowered, therefore degrading its value on the export markets (particularly in Britain).<sup>235</sup>

The NZSCE viewed standardisation in New Zealand as of vital national importance and financially backed the NZSI. The Society provided an office and Harold Cole doubled as

NZSI Secretary. The NZSI first met on 7 July 1932.<sup>236</sup>

With the Great Depression funding slowed, leaving a deficit of £28.<sup>237</sup> This was recovered but the ongoing funding proved difficult. Cole's workload was "onerous", even for a "tremendously hard worker". Members found Cole too busy with standards' work to attend to Society business. One said that "unless the Society curbed his enthusiasm, he feared Mr Cole would injure his health".<sup>238</sup>

When these financial woes threatened the NZSCE's work on a model building code, the Society lobbied the Government to fund the NZSI. The Prime Minister was anxious to announce the completion of the Building Code, but would not guarantee financing the NZSI.<sup>239</sup> Eventually they obtained an interim government grant of £200, but delays by the NZSI Council to endorse the Building Code did not help open the Government's purse.<sup>240</sup>



*Harold Cole.*  
*IPENZ Collection.*

At the end of 1935, another crisis befell the NZSI. Public criticism of the Institution's "present failure to function" – implying that it was not "prepared or able to function more actively" – was reported in the media on 7 November.<sup>241</sup> Cole took the criticism personally as an attack on his efficiency, and tendered his resignation as NZSI Secretary. This, however, was not accepted.<sup>242</sup>

More seriously was the Wellington Manufacturers' proposal that its national body withhold recommendation "with regard to the repetition of financial contributions to the Standards Institution".<sup>243</sup>

The Society then recommended a stand-alone standards institution: funded for five years; concerned only with standard specifications; which should be adopted as widely as possible "by public bodies in the specification and purchase of commodities"; that compliance is checked; and that the Department of Scientific and Industrial Research (DSIR) conduct the research necessary for standards to be set.<sup>244</sup> This was not adopted. Members at the NZSI's AGM later in November 1935 were indignant, believing it to be a "scandal" that four years had elapsed since the Hawke's Bay earthquake and the model building codes were still not ready.<sup>245</sup>

Soon after, the Government brought the work of the NZSI wholly under the wing of the DSIR. Cole said "[t]his definitely finishes the Institution".<sup>246</sup> This time his resignation

as Secretary to the NZSI was accepted. Cole criticised standards imposed by government mandate, “with or without the consent of the various interests involved”.<sup>247</sup>

Although he had resigned, Cole continued to work as Secretary and in March 1936 was offered a position with the DSIR. He said his services “are bespoke elsewhere. I am not a candidate.” He had accepted the position in 1932 “not with the object of ultimately throwing over my appointment with the New Zealand Society of Civil Engineers”. He hoped his “work of the past four years had not been wholly wasted”.<sup>248</sup>

Despite Cole’s disappointment, the Government had committed itself to adopting standards across the board.<sup>249</sup> The NZSCE’s efforts were crucial to the Government adopting standards as policy.

The NZSI ceased to exist mid-year and from August a New Zealand Standards Institute was formed within the DSIR. It had two staff and an Advisory Council of 20 members and 21 committees to work with different sectors.<sup>250</sup> As would be expected, the NZSCE was asked to nominate one member to represent it on the Advisory Council, to which the Society sent Frederick Furkert, now in retirement but working as a consultant.<sup>251</sup> Members also sat on the many standards committees formed.<sup>252</sup>

### BUILDING BYLAW

Taking the standards role in-house allowed the DSIR to finally push ahead with the Model Building Bylaw. When the Bylaw was released in 1936, little credit was given to the earlier Building Code Committee and Bylaws Panel, convened for the NZSI by J O’Shea.<sup>253</sup> From the Model Building Bylaw 1936, extensive building codes were developed for local authorities for which New Zealand has to be thankful.<sup>254</sup> The Bylaw was updated every decade from 1939 until the 1970s, when provisions for loadings and materials were separated.<sup>255</sup>

The NZSCE participated in the Conference on Local Body Bylaws in 1937, but its lack of interest for the new regime was not shared by all members. Galbraith went with the NZSI on its absorption into the DSIR, becoming its Chair from 1941 to 1954. A paper from him on “Standardisation and the New Zealand Standards Institute” was declined for publication in *Proceedings*, possibly indicating a residual bitterness, silo mentality or institutional jealousy.<sup>256</sup>

Despite 166 New Zealand standard specifications being promulgated in its first two years, the Standards Institute and the DSIR proved to be “uneasy bedfellows”.<sup>257</sup> Therefore, in late 1938 the Institute was moved to the Department of Industries and Commerce.

The first New Zealand Standards Act was passed in 1941. The NZIE showed little enthusiasm for it and after the War set up its own committee on standards.<sup>258</sup> Under Richard Stanley Maunder (1890–1974), the committee called for the repeal of the 1941 Act and the re-establishment of an independent standards’ body.<sup>259</sup> This carried no sway, but the engineers preferred to exercise influence in a backroom way, through their voices on the NZSI Council and many technical committees on which they were to be represented for many decades.

## PROFESSIONAL ETIQUETTE/ETHICS

Ethical behaviour had long been discussed under the banner of professional etiquette, but a written code did not appear for many decades. The United Kingdom parent institutions were strong models for proper behaviour. Engineers were expected to tell others of faults “in a gentlemanly, brotherly manner”.<sup>260</sup> They frowned upon employers tendering for engineer services or asking what remuneration engineers expected. This was because it attracted ill-qualified people and lowered the price paid. ICE said it was “bad form” to participate and the NZSCE agreed.<sup>261</sup>

But New Zealand was a new world where local authorities were perennially financially stretched and looking for cost-effectiveness. Those without engineers on staff tendered for their services and, under constant scrutiny of ratepayers, often accepted the lowest bid. In a 1916 circular, the Society viewed this as “a breach of professional conduct” and “opposed to the best interests” of the profession.<sup>262</sup> Members who responded to such adverts were liable for expulsion.

If members were to adhere strictly to this, only the consultants would lose work. At the 1921 conference, Samuel Crookes (1871–1955) raised the issue, punning on the double meaning of his name to ask if consultants were to tow the line and starve – or bend the rules and risk being expelled. This had been prompted by the Manukau County Council calling publicly for tenders for its Hunua hydro-electric scheme. Henry Toogood said members “who were in private practice were ‘up against’ this sort of thing all the time”.<sup>263</sup> President Cyrus Williams (1862–1942) said the issue “was going so near the wind that the Council had been unable to come to any decision on it”.<sup>264</sup> It expelled one member for misconduct but was otherwise undecided whether to strike off transgressing members as would happen in the legal or medical professions.

There was an element of elitism in the master engineer not stooping to seek work but expecting to be sought out. This rule also suited public sector engineers whose careers involved no soliciting at all, but was clearly self-defeating for the self-employed. It was also out of step in a relatively new country needing to build a lot of infrastructure.

Of course, professionals competed for work and exhibited jealousy when another was favoured. A case in point was the spat between HM Crystall and Francis Charles Hay (1884–1964) in 1926. Hay, who was a NZSCE member, had nominated registered surveyor HW Harris for river-protection works for the Waimakariri River Trust. Crystall criticised this and Hay answered. The debate got notably acrimonious, enough “to sink all the refined feeling usually displayed between professional gentlemen”.<sup>265</sup>

Crystall was an Associate member of ASCE and mentioned its Code of Ethics, leading the NZSCE to consider adopting its own version. As “an officers’ organization”,<sup>266</sup> the Society was expected to ameliorate the behaviour of its members, but the ERA had widened the

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definition of engineer to include the unqualified and non-members. Had a code been drafted at this time, it could not have produced harmony among the wider profession.

A quality control system established expectations of the behaviour of members when elected. The reasons for the rejection of applicants would not be broadcast, but prospective members had no doubt about the behaviour expected of them.<sup>267</sup> Though no code was written, the Council still knew when professional etiquette had been breached in the rare cases it considered. A member investigated in 1930 expressed regret and no further action was taken (neither his name nor the details of the breach were published).<sup>268</sup>

The Council compared members' actions against Section IV of the Rules on Professional Conduct. These demanded that members act in a trustworthy or "fiduciary manner".<sup>269</sup> Their remuneration should only come from overt charges (allowing no possibility for back-handers or under-the-counter payments), and they were not to make profit-sharing arrangements with clients. No engineer should be involved with a third party who would benefit from the engineer client relationship, be it in the supply of goods, additional services or owning patents. Soliciting for clients, directly or indirectly, was outlawed. These rules had existed since 1915 and were updated and republished every few years.

Beyond the simplistic rules, a code of behaviour would cover more aspects and with more subtlety. In 1940, the President Edward Hitchcock (1883–1966) referred to "the unwritten code which is generally held to regulate professional engineers' behaviour towards each other". The majority of the Corporate members were "no doubt aware of it".<sup>270</sup> This was informed by one of the original objects of the Institution which was to "bring about more general professional intercourse, and exchange of ideas...". The word "Professional" carried with it implications for the manner in which the discourse was to be conducted, but it was not defined.

Discussions got heated in 1941, leading to accusations of professional misconduct. This was informed by the NZIS having in 1938 enacted the power to make and enforce rules of conduct of its members, highlighting in contrast the lack of such provisions in the NZIE. In what was described as his "rambling... annual censure of the Council" for a variety of failings, Toogood came into conflict with Secretary Harold Cole.<sup>271</sup> Cole quoted a few words of Toogood's, who took exception. He "directed... a hymn of Hate... at the Secretary personally, for some imaginary aspersion" cast upon himself. Cole replied that Toogood was being "illogical in substance and offensive in tone. It is a personal [attack], and was intended as a public attack upon the secretary..."<sup>272</sup> After the Executive Committee reprimanded Toogood for making "unwarranted reflections" on the Secretary, the matter subsided and the NZIE got back to working out how to encourage better public behaviour from members.<sup>273</sup>

In 1946 the Rules were changed to ensure only people deemed "fit and proper" would be elected to the Institution. The Convenor of the Rules Standing Committee said there had up to then been nothing "to prevent a person of undesirable reputation" becoming a member.<sup>274</sup>

Finally, after the delay of the Great Depression and the Second World War, the NZIE got around to writing a code of ethics in 1951.

## A TEST OF ETHICS

An issue raised in the 1930s about relations between architects and engineers was actually one of professional conduct. It arose after a dispute between two Wellington-based consultants – structural engineer Samuel Taylor Silver (1882–1939) and mechanical engineer and architect, Alexander Mitchell.

They had worked together since 1914 – Mitchell, as an architect using Silver’s services both as an engineer and more importantly as a source of steel. Silver was never paid for his services but made his money from the margin applied to the steel. This arrangement was not disclosed until 1927 when the scam fell apart in a cool store job for a fishing company.<sup>275</sup>

When the fishing company found out that the steel had been marked up by 77 per cent, it took its main contractor to court. Mitchell had to pay £526 back and so, in 1931, he took Silver to court to reclaim that, plus £250 damages.<sup>276</sup>

The heart of the matter was the lump-sum practice “which was notorious among architects, engineers, contractors and others”.<sup>277</sup> This involved professionals providing ostensibly free services to clients but with a hidden profit built in to the price of goods supplied. The service here was Silver’s structural calculations and providing the goods he had a monopoly for (via an arrangement with the importer). The Society had railed against such “invidious” practices, saying an “unscrupulous man” will use his position to “increase his emoluments by bye-products, ... secret commissions, or what the Americans call a ‘rake-off’”.<sup>278</sup>

Though no fraud was found, the case in 1931 went against Silver. “Do you realise,” the Supreme Court judge asked, “that you cannot properly perform your duties as a consulting engineer while selling steel?”<sup>279</sup> Silver complained to the NZIA about Mitchell not protecting him.<sup>280</sup>

Silver also appealed the following year and though he won, neither man came out unblemished. The Court of Appeal said they both conspired to defraud their client.<sup>281</sup>

From the Society’s point of view, outlawing this kind of behaviour in the Rules was insufficient; it needed to be made unattractive in a code of practice and by ethical leadership. The Society was reluctant to get involved publicly, especially since both men had been appointed to Cull’s Building Regulation Committee in 1931. Mitchell was a NZSCE member and Silver joined in the 1932/1933 financial year. Though the issue was “ventilated” at the 1933 annual conference, the discussion was held “in committee” and not published.<sup>282</sup> Silver resigned from the Society before receiving any formal censure from it and therefore “without pressure from an explanation to Council”.<sup>283</sup>

Overtly, this soured relations between the Society and the NZIA. Membership of the NZIA was a precondition for registered architects, a monopoly the NZSCE did not have.<sup>284</sup> They

entered into negotiations “with a view to defining the division of work and responsibility” between the professions.

The Society proposed that “engineers should be consulted but not called upon to do detailed work until arrangements had been settled between client and architect”.<sup>285</sup> The Architects accepted this and a year’s trial was agreed; amicability was restored.

### PROFESSIONAL BODY OR UNION?

Another issue that some civil engineers thought of as undesirable was compulsory unionism. It arose in the late 1930s in the wake of New Zealand’s first Labour government. Seen as anathema to a professional association, it provoked interesting discussion.

The Industrial Conciliation and Arbitration Amendment Act of 1936 made it illegal for companies and organisations, who volunteered to register under the Act, to employ a person who was not a member of a union covered by an award. This was designed to improve wages and conditions. The Act was to apply from 1 May 1936, International Workers Day, the coincidence being no accident.<sup>286</sup>

In Dunedin, supporters of this Act moved to form a union for council staff including engineers. The Dunedin City Council responded by forming its own City Corporation Union of Engineers.<sup>287</sup> It expanded to include junior engineers and engineering assistants employed by other local authorities and the electric supply authority.<sup>288</sup>

The Otago Branch raised the question of the Society registering as a national union.<sup>289</sup> While the NZSCE had around 500 Corporate members at the time, there were believed to be 900 registered engineers in the country.<sup>290</sup> The Labour Department soon confirmed that “compulsory unionism applied only to workers who are subject to an award or industrial agreement”, so did not apply to qualified engineers.<sup>291</sup>

Therefore, the Society took no action over the union formed in Dunedin and suppressed discussion on the matter at the 1937 conference.<sup>292</sup> The Council decreed that it “is undesirable for the Society... to undertake or to be concerned with functions which are definitely of a trades union character, although there is nothing whatever... to debar members from joining such other organisations as... their own particular economic interests may demand”.<sup>293</sup>

This affair may have been behind the Otago Branch’s proposal in 1937 to suggest a scale of annual salaries for junior engineers, in an attempt to keep them out of the grip of the hourly-rate unionists. The Executive Council set up a sub-committee to look at this, which certainly compared juniors’ salaries with those recommended in the Conciliation Board proceedings.<sup>294</sup> If engineers’ annual salaries could be raised over £330, the issue would cease to apply as the rule of thumb was that unions were to be for employees earning under that amount.

This was not to be the Society’s last brush with unions, but it nonetheless helped clarify its role for its members.

## COMING OF AGE AS THE NEW ZEALAND INSTITUTION OF ENGINEERS

Debate about a change in name arose again in 1937, though the “question had remained a more or less active one” since 1928, when a proposal for change was last voted down by all members.<sup>295</sup> At other times, the Council had preserved their conservatism by voting to prevent the issue being debated by the wider membership. In 1935, however, the vote by councillors was evenly split, the Chair Hugh Vickerman using his casting vote to again prevent wider discussion at the next conference.<sup>296</sup> It came up again at the 1937 conference in Christchurch, attended by 136 members (27.5 per cent of the total roll). This time the Council kept its opinions to itself, aware that a mood for change was afoot.

Mechanical and electrical engineers had always said the term “civil engineer” was “not generally acceptable”.<sup>297</sup> The Council now agreed “that inclusion of engineers of all categories in one organisation is of major importance to the profession as a whole” even if it meant changing a name.<sup>298</sup> Desiring to review the situation, the conference moved to canvass the issue with branches and then hold another referendum (among Corporate members only). A popular alternative name proposed at the conference was the Institution of Engineers New Zealand, soon re-arranged to the New Zealand Institution of Engineers.

The Council sent out a circular on the subject in April 1937 to the branches. Now the original distinction between civil and military engineering had ceased to have its former significance. The term “civil” was definitely seen as unwelcoming to engineers from other fields who might want to join. More specifically, changing the name “would act as the deterrent to the formation of separate Societies, and would thus promote unity” and boost membership.<sup>299</sup>

Electrical engineer Samuel Crookes reported on a July meeting of electrical engineers in Auckland, which by the very fact of it happening showed the mood for change. Several men present said they would join the Society “if there was a change of name”.<sup>300</sup> The growing might of these non-civil engineers is reflected in the fact that Crookes was soon nominated for President, and his election was a conciliatory gesture towards the electrical engineers.

Branches reported back heavily supportive of change, favouring the proposed new name (the four main-centre branches with a total membership of 299 recorded 150 votes for and seven against).<sup>301</sup> With this result in June, the next stage was a referendum. This returned 85 per cent in favour of change which, after a confirming SGM in Wellington on 15 September 1937, led to the new name being adopted. Therefore, the NZIE was registered on 23 September 1937. The Institution was quick to state that the “change implies a broader range of interests but no break in the historic continuity of the organisation”.<sup>302</sup> Introducing the change, the Council said “that the prestige, consideration and authority attaching to an institution such as this depend on two essential factors, namely the professional standards of its members, and the nature of our Objects”.<sup>303</sup>

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*NZIE Annual Conference, Dunedin, 1938 (detail).*

*IPENZ Collection. Starting second row, fourth from the left, are: John Lancaster, Francis Corkill, unidentified, Francis Maclean, Samuel Crookes, James Wilkie, John Cull, Alfred Baker, Frederick Furkert, and Harold Cole.*

The new name was a reflection of change deeper than just outward appearances, but was very much a coming of age. Now a quarter of a century old, the body representing all engineers in New Zealand had passed the 500-member threshold, and had long ceased to print all their names in *Proceedings* (instead publishing changes to membership – new, promoted and dead – and full rolls in *Yearbooks*).<sup>304</sup>

## ENDNOTES

- 183 Toogood's description in *Procs NZSCE 1929-30*, 45.
- 184 *Ibid.*
- 185 *Ibid.*
- 186 *Ibid.*, 46.
- 187 *Procs NZSCE 1930-31*, 55. *Procs ASCE 1929*, 55:7.
- 188 *Procs NZSCE 1930-31*, 58A.
- 189 *Procs NZSCE 1932-33*, 18. *Procs NZSCE 1931-32*, 52.
- 190 EC Minutes, 30 August 1933, 3.
- 191 *Procs NZSCE 1936-37*, 36.
- 192 *Ibid.*
- 193 EC Minutes, 17 August 1938, 3. EC Minutes, 18 May 1938, 3.
- 194 Neutze, *Design for a Century*, 19.
- 195 Judith Bassett, *Prospero's Island - A History of the School of Engineering at The University of Auckland* (Auckland: University of Auckland School of Engineering, 2003).
- 196 'News of the Day,' *Colonist*, 5 March 1910, 2.
- 197 'Engineers' Qualifications,' *Auckland Star*, 21 August 1923, 4.
- 198 EC Minutes, 23 March 1933
- 199 'Report of Committee on Education of Engineering,' *Procs NZSCE 1935-36*, 44. 'Matric,' later equivalent to Higher School Certificate in the 7th form, is now (2013) incorporated into the National Certificate of Educational Achievement Level 3 in Year 13.
- 200 *Procs NZSCE 1936-37*, 36.
- 201 Mr Lancaster, Committee Member, *ibid.*, 39.
- 202 'Education & Training of Engineers,' *ibid.*, 77.
- 203 *Procs NZIE 1937-38* (part 1), 26.
- 204 *Ibid.*, 33.
- 205 *Ibid.*
- 206 JR Baird, 'The Prevention of the Disastrous Effects of Earthquakes,' *Procs NZSCE 1930-31*, 414.
- 207 *Procs NZSCE 1930-31*, 46.
- 208 *Ibid.*, 44.

- 209 Ibid., 45.
- 210 Ibid., 33, 51-66. A limited programme of site visits was run to Hobsonville, Auckland harbour, Titirangi concrete works, Arapuni and Huia Dam and waterfront road.
- 211 Ibid., 45.
- 212 'Future Building,' *Auckland Star*, 17 February 1931, 9. *Procs NZSCE 1930-31*, 43.
- 213 *Procs NZIE 1943*, 104. Other non-members on the committee were: AG Bush, borough engineer, Lower Hutt; J Fletcher, Fletcher Construction Company, Auckland; J M Graham, builder and contractor, Christchurch; J T Mair, Government Architect; W M Page, architect, Wellington; Samuel T Silver, structural engineer, Wellington. The secretary was Dr M A F Barnett, Department of Scientific and Industrial Research. 'Safe Building. To Resist Earthquake,' *Auckland Star*, 10 June 1931, 9.
- 214 Cull in *Procs NZSCE 1932-33*, 23.
- 215 Ibid.
- 216 *Procs NZSCE 1933-34*, 18. Also supporting the Building Construction Act was the New Zealand Institute, NZIA, and New Zealand Federated Builders and Contractors Industrial Association of Employers. NZSCE also appeared before the Parliamentary Bills Committee over the Institute of Clerk of Works Bill. *Procs NZSCE 1932-33*, 18.
- 217 Council Minutes, 19 February 1934, 2.
- 218 *Procs NZSCE 1932-33*, 26.
- 219 JR Baird, 'The Prevention of the Disastrous Effects of Earthquakes,' *Procs NZSCE 1930-31*, 414.
- 220 Ibid., 417. Holgate advised Wellington city on the vulnerability of its Town Hall's tower and Hart had it removed. See 'Town Hall Tower,' *Evening Post*, 19 April 1934, 12.
- 221 Peter Holgate, 'Building Construction to Resist Earthquakes,' *Procs NZSCE 1932-33*, 213. IR Robinson and HL Benjamin, 'Effects of Earthquakes on Electrical Supply Systems,' *NZSCE 1932-33*, 256.
- 222 Ibid., 227.
- 223 Galbraith in *Procs NZSCE 1933-34*, 27.
- 224 'Shock-Proofing,' *Evening Post*, 10 March 1934, 14. Section 41 of the Finance Act 1931 (No.2) [21 Geo V] said every Borough Council could make bylaws under the Municipal Corporations Act 1920 "for the purpose of regulating and controlling the design and construction of buildings in relation to their resistance to earthquake shock". The 1934 conference raised the matter under discussion on the Report of Council, *Procs NZSCE 1933-34*, 18.
- 225 Toogood in *Procs NZSCE 1932-33*, 25. See also Newnham, *Learning Service Achievement*, 33.
- 226 *Procs NZSCE 1933-34*, 18. The others lobbying for the Bill were the New Zealand Institute and the New Zealand Federated Builders' and Contractors' Industrial Association of Employers.
- 227 Toogood at the Annual Conference, *Procs NZSCE 1933-34*, 24.
- 228 Toogood in *Procs NZSCE 1930-31*, 46.
- 229 Galbraith discussing a report of the council in relation to Christchurch at the Annual Conference, *Procs NZSCE 1933-34*, 22.
- 230 The British Engineering Standards Association formed in 1901 as the Engineering Standards Committee, changing its name in 1918. Parsons, *History of the Institution of Mechanical Engineers*, 7, 42. Watson, *The Civils*, 60. Maistre outlined the Association's formation in 'Engineering Standards,' *Evening Post*, 28 June 1922, 13.
- 231 Quote Holmes in *Procs NZSCE 1922-23*, 233. NZSCE published some papers on standardisation during this period: *Procs NZSCE 1922-23*, 233.
- 232 *Procs NZSCE 1924-25*, 44.
- 233 Parsons, *History of the Institution of Mechanical Engineers*, 7, 42. Watson, *The Civils*, 60.
- 234 *Procs NZSCE 1931-32*, 57.
- 235 'Saving an Industry,' *Evening Post*, 12 May 1931, 8.
- 236 Newnham, *Learning Service Achievement*, 37. Other backers were the NZIA, Associated Chambers of Commerce, Shell Company of New Zealand Limited and New Zealand Federated Ironmasters' Association.
- 237 Memo for EC on New Zealand Standards Institute by HLC [Harold L Cole], 14 July 1933. The £28-2-2 debt was owed to NZSCE. Report and Financial Statement for Year Ending 30 June 1933, *NZSI Bulletin*, vol.2. Minute Book 1933-35.
- 238 *Procs NZSCE 1935-36*, 28.
- 239 EC Minutes, 24 July 1935, 25 September 1935. The Council's deputation to the Prime Minister included Furkert, Toogood and Cole, but by the time they were received on 24 September 1935 the group had swelled to include Vickerman and Dr Ernest Marsden.
- 240 EC Minutes, 31 October 1935.
- 241 'Standards Institute,' *Evening Post*, 7 November 1935, 10.
- 242 Cole to General Council NZSI, 11 November 1935. SR to EC, 11 November 1935. EC Minutes, 20 November 1935. Cole to Callaghan (DSIR), 9 March 1936. Minute Book 1933-35.
- 243 'Standards Institute,' 10.
- 244 EC Minutes, 15 January 1936. SR, 6 January 1936.
- 245 Quote from 'Vital Principle of Standardisation Necessary to Industry,' *Evening Post*, 23 November 1935, 17.
- 246 SR, 10 March 1936.
- 247 Cole to FR Callaghan (DSIR).
- 248 Ibid.
- 249 SR, 10 March 1936.
- 250 JD Atkinson, *DSIR's First Fifty Years* (Wellington: DSIR, 1976), 41.
- 251 EC Minutes, 29 July 1936, 3.

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- 252 These included on the Building Code, Civil Engineering and Mechanical Engineering, Local Bodies and Public Authorities, Bridge Loads and Stresses, Fire Prevention, Asbestos Cement Products, Trade Headings and Specifications, and Town Planning Committee.
- 253 EC Minutes, 28 August 1935.
- 254 Newnham, *Learning Service Achievement*, 37.
- 255 'Standards and Regulations for Building and Construction in New Zealand.' Report to the Royal Commission on Canterbury Earthquakes (Wellington: IPENZ, 2011), 19.
- 256 EC Minutes, 20 July 1938, 3. *NZE* 12:5 (May 1957), 180.
- 257 Atkinson, *DSIR's First Fifty Years*, 42. Newnham, *Learning Service Achievement*, 37.
- 258 Newnham, *Learning Service Achievement*, 53.
- 259 Standards' Policy Sub-Committee Report to Council, n.d [circa June 1951]. Minute Book 1950-51.
- 260 Galbraith in *Procs NZSCE 1925-26*, 49.
- 261 Crookes in *Procs NZSCE 1920-21*, 39. Watson, *The Civils*, 62.
- 262 First quote: *Procs NZSCE 1915-16*, 6. This was a breach for "replying to advertisements inviting applicants for positions to state the salary expected by them". Second quote: *Procs NZSCE 1920-21*, 39.
- 263 *Procs NZSCE 1920-21*, 41.
- 264 Ibid.
- 265 Cited in McRae, *New Zealand Institute of Surveyors*, 349.
- 266 John Barr in *NZPD*, vol.204, 1097. Barr added "there is always a danger of clashing when professional men, artisans and others have to work together and belong to different bodies. When they belong to one body there is every chance of harmonious work being done".
- 267 *Procs NZSCE 1925-26*, 27.
- 268 *Procs NZSCE 1929-30*, 34.
- 269 Rules, Section IV, Clause 16 in *Procs NZSCE 1929-30*, 353.
- 270 Minute Book 1940-41, 6 December 1940. IPENZ Collection.
- 271 Cole Note n.d., on Toogood to Secretary, *ibid.*, 20 February 1941.
- 272 Ibid.
- 273 EC to Toogood, Minute Book 1940-41, 18 April 1941.
- 274 *Procs NZIE 1945-46*, 88, 91.
- 275 The New Zealand Trawling and Fish Supply Co Ltd cool store in Cable Street, Wellington.
- 276 'Supreme Court,' *Evening Post*, 24 October 1930, 15. Mitchell was ordered by the Supreme Court to refund £982 for alleged negligence.
- 277 'Cost of Steel,' *Evening Post*, 7 September 1931, 8.
- 278 *Procs NZSCE 1914-15*, 39.
- 279 'Building Steel,' *Evening Post*, 8 September 1931, 10.
- 280 Ibid. Silver had been advertising this since 1914, which the judge called "specious". He was ordered to pay Mitchell £323.
- 281 'Inflated Price,' *Evening Post*, 15 October 1931, 14.
- 282 'Both to Blame,' *Evening Post*, 12 April 1932, 11.
- 282 Council Minutes, 20 February 1933, 2.
- 283 Secretary to Institution of Structural Engineers (ISE), EC Minutes, 23 March 1933, 2. Silver appears on no membership list, which appeared annually as at 21 December, but his resignation from NZSCE is clearly described in EC Minutes, 27 April 1933, 1. The Society's Council was about to conduct an official enquiry into his actions, as called for by Hon, Justice Blair's judgement in the Supreme Court, when he resigned. The Society was also fielding enquiries about Silver from ISE in the United Kingdom, of which he was also a member, and felt obliged to inform it of the recent court judgements. EC Minutes, 24 May 1933. None of NZSCE's replies to ISE about Silver have survived.
- 284 EC Minutes, 31 October 1935. Media comment favoured the engineers' position.
- 285 EC Minutes, 28 March, 26 April and 30 May 1934.
- 286 New Zealand Parliament, 'Industrial Conciliation and Arbitration Amendment Act' *New Zealand Statutes*, 1936, 74. Available from Early New Zealand Statutes, URL: <http://www.enzs.auckland.ac.nz>
- 287 Secretary's Report (SR), 21 April 1936. EC Minutes, 29 April 1936.
- 288 The union's full title was the Dunedin City Corporation and Dunedin Drainage and Sewerage Board Engineer Officials Industrial Union of Workers. Its 30 inaugural members included 14 corporate members of NZSCE, five non-member engineers and 11 non-engineer staff (such as draughtsmen). Secretary, 'Note on Unions of Engineering Employees,' Minute Book 1936-37, 6 July 1936.
- 289 Ibid.
- 290 EC Minutes, 24 June 1936, 2.
- 291 EC Minutes, 23 September 1936, 1.
- 292 Council Minutes, 15 February 1937, 4.
- 293 *Procs NZSCE XXIII 1936-37*, 28.
- 294 Special EC Minutes, 28 May 1937. EC Minutes, 16 June 1937.
- 295 Circular on 'Proposed Name Change,' Minute Book 1936-37, 15 April 1937.
- 296 EC Minutes, 18 December 1935.
- 297 *Procs NZIE 1937-38*, 13.
- 298 *Procs NZSCE 1936-37*, 27.
- 299 Circular on 'Proposed Name Change'.

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- 300 'Confidential Information for Members of Council,' Minute Book 1936-37, 9 July 1937.
- 301 EC Minutes, 16 June 1937.
- 302 Procs NZIE 1937-38, 22. Rule 1 which stated the name of the organisation was amended on 22 February 1938. *Procs NZIE 1937-38*, 228.
- 303 Memo on new rules, 8 December 1937, IPENZ Collection.
- 304 A separate membership list was published in 1931 (as at 31 December 1930), a year before the last one appeared in *Procs*. From 1933 it was called the *Yearbook* with a List of Members, and 10 pages of committee and award information. *Procs NZSCE 1932-33*, 11. A quarterly *Bulletin* also started in 1933. *Transactions* were mentioned in 1935, *Procs NZSCE 1934-35* and a newsletter in 1945, *Procs NZIE 1945*.



# 1940s TO 1950s

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## SECOND WORLD WAR DEFENCE ISSUES

The war clouds of the late 1930s turned minds in the NZIE to military engineering – again. In 1914, only two per cent of engineering unit personnel were qualified engineers, but in 1918 this figure was 16 per cent. Their skills were to be in even greater demand.<sup>305</sup>

Fewer members had joined the Territorials, leading Frederick Furkert to warn that they “would find themselves... privates and corporals serving under butchers and tinkers and plumbers... [who] were more credit to their country than the engineers...”.<sup>306</sup>

A defence sub-committee was set up.<sup>307</sup> It was to “study problems connected with civil organisation for defence”<sup>308</sup> and work with the other emergency committees. Members “pledge[d] themselves to give their fullest co-operation and assistance in the defence of the country”. When the proposer, Henry Toogood, was asked if he could cut out a phrase seeking guidance from government departments, he ejected “All right, cut it out, as long as you *do* something”.<sup>309</sup>

One member opposed a suggestion that the NZIE ask the Defence authorities what to do, because “it cast a slur on the Institution: it looked as though they... did not know their own minds”.<sup>310</sup> They were keen to be seen as proactive.

The Institution circulated a voluntary service register, asking what military experience members had.<sup>311</sup> Within a few months over 300 replies were received.

The Director of Mobilisation took the Institution at its word after the War started. The Air Force particularly needed engineers, as did the ordnance workshops.<sup>312</sup> Yet the numbers coming forward were disappointing.<sup>313</sup>

Serving members were exempt their annual subscription by the Institution.<sup>314</sup> This was intended for those called up or given a military job at a financial disadvantage. When PWD aerodrome engineer Squadron Leader Esmond Allen Gibson (1896–1981) applied for this

concession he was denied it, having been merely transferred to the Royal New Zealand Air Force (RNZAF) “without loss of salary or lien”.<sup>315</sup>

In December 1941, arrangements for emergency precautions were made with the landlord, Federations Limited, including a roster for fire-watching by staff. The NZIE’s library windows were blacked out to make it usable in evenings.<sup>316</sup>

The War affected normal Institution activities in other ways. A luncheon venue, for instance, was not available owing to staff shortage or Air Raid Precaution work. Restrictions on travel meant the 1944 conference planned for Wanganui was abandoned, a cut-down meeting being held in Wellington instead.<sup>317</sup>

However, normal business also carried on. Secretary Harold Cole was absent from administrative duties after the Hutt Valley railway accident on 8 November 1943, having been appointed to the Board of Inquiry.<sup>318</sup>

The War did not interrupt the *Proceedings* publication programme, except that it was published quarterly in 1942–1944. Wartime works were reported on: “Linen Flax and the Erection of Processing Works in New Zealand”; “Aerodrome Lighting”; “Destruction of Public Facilities in Italy”; “Salvage and Repair of Ships in Wartime”; and “Engineering in the Middle East Theatre”.<sup>319</sup>

As in the First World War, many NZIE members rallied to the flag. The total that served fulltime was 187, of whom 13 were in the Navy (plus one in the Merchant Navy), 37 in the Air Force and the rest in ground forces. Of these, seven died on active service.<sup>320</sup> An advisory committee for ex-service members was formed in 1945.<sup>321</sup>

Whenever the Institution learnt of the death of a member or close relative, the Secretary wrote to the next of kin.<sup>322</sup> The exception was when Cole had a personal loss. His son William was reported missing in 1941 after flying operations off North Africa. The 21-year-old’s death was only confirmed after an agonising wait. Though details were included in the Institution’s publications, his relationship to the Secretary was not (presumably to avoid undue sentimentality).<sup>323</sup> No one begrudged the Cole his retirement to Nelson shortly after this. Douglas Laurence Bedingfield (1903–1969) became Secretary in 1944.

Probably the best known wartime engineer was Frederick “Bull” Hanson (1895–1979), who had joined NZIE in 1925. He was famous for being the only man to argue with British General Montgomery (1887–1979) and *not* be fired. He had fought in the First World War and won the Military Medal. Afterwards, he joined the Territorial Force sappers. His engineering career included work on PWD hydro-electric projects, rising to District Engineer in Wellington in 1927, and later became resident engineer for the Main Highways Board. Dropping all this for Second World War service with the 2nd New Zealand Expeditionary Force, he was commissioned and rose to command the engineers in the New Zealand Division and later a British corps. After the War, he returned to senior roles with the Main Highways Board and then the PWD, eventually becoming the Commissioner of Works

between 1955 and 1961. Amid this hectic professional and territorial life he was President of the NZIE in 1955–1956. His papers on roading twice earned the Institution's top award, the Fulton Gold Medal: the second time it was described in military-speak as "the Fulton Gold Medal and bar".<sup>324</sup>

## **THE REGISTRATION BOARD AND THE AMENDED REGISTRATION ACT (1944)**

Need for amending the ERA was long known and the Minister of Public Works, Robert Semple (1873–1955), had an updated Bill drafted in 1937.

The Institution's Status of the Profession Committee sent a suggested amendment to the Minister in 1938. This added other obligations on income tax, electrical supply authorities and surveying.<sup>325</sup>

Semple's Bill then languished for seven years, leading Francis MacLean to goad Toogood (the two perhaps at different ends of the political spectrum) by saying Semple "was still in power and nothing had been done".<sup>326</sup> Surveyors had no objection to this amendment and it passed in December 1944.<sup>327</sup>

Under the amendment, local authority engineering works now had to be supervised by a registered engineer consultant or employee. From 1 April 1945 it applied to local authorities spending more than £10,000 on construction and maintenance.<sup>328</sup>

Engineers above a certain grade in the public service (other than in the PWD, which already operated this requirement) now had to register in order to expect any advancement. The Amendment Act introduced the Annual Practising Certificate.

The ERB was proactive with rehabilitation of engineers whose careers had been put on hold or blighted by active war service. They were given six months from the time of their discharge to register, a longer term than offered to civilian applicants.<sup>329</sup>

The ERB moved in with the NZIE on The Terrace, and its workload soared as many previously unregistered engineers applied for their Practising Certificate. The Registrar, member Eric Ernest Hendriksen (1907–1970), later became Honorary Secretary to the Institution's own central standing Engineering Education, Training and Examinations Committee.<sup>330</sup>

The Amendment Act made another concession. It reopened a back-door registration for unqualified local government employees over 35 who had amassed six years' experience in responsible engineering work in the previous dozen years. This loophole was only available for six months after the Act passed, closing on 1 May 1945 (or six months after demobilisation, for service personnel).<sup>331</sup>

William Newnham was appointed the new Chairman of the ERB but expressed disappointed at this aspect, which he feared would "lower the status of the Profession".<sup>332</sup> At the time around 30 per cent of all registered practising engineers in the country were believed



William Langston Newnham.

Past Presidents of the New Zealand Institution of Engineers, 1914–1966  
Album, IPENZ Collection.

to be registered under the earlier acts by this back-door means with both the 1924 Act and the 1928 amendment creating an opportunity for a few months after being passed.<sup>333</sup>

The Minister urged the Board to be liberal in approving registration of unqualified foremen, a plea that sent shudders up the spine of Institution members as well as those on the Board.

Not all cases were treated leniently. The Professional Engineers Association of New Zealand (PEANZ) complained that some of their members were refused registration.<sup>334</sup> Regulations issued a year after the amendment clarified how appeals would be heard.<sup>335</sup>

Architects also complained, so the Board set up a committee of architects and engineers to advise on cases where exemption had been applied for.<sup>336</sup>

While independent of each other, the Institution exerted its influence over the ERB. When requiring a subtle interpretation on how the Board should meet its requirements, the Institution would capture the Board through its appointees.

## ALIEN ENGINEERS

The outbreak of the Second World War involved the Institution in the issue of assimilating refugees from Europe. Jews and other persecuted minorities were fleeing Germany and axis fascist regimes, and around 1,100 arrived in New Zealand in the late 1930s.<sup>337</sup> Most were intellectuals and creatives, or else professionals or learned in the sciences.

This first touched the NZIE when the University of New Zealand senate asked its opinion on accepting engineering students from among the refugees. Specifically, a German student Erwin Ziffer (d.1978?) had applied to continue studying for a Bachelor of Engineering degree. This was known as *ad eundem gradum* (recognising the studies to date from another university). The NZIE sought the opinion of ICE and in the meantime gave its view that no *ad eundem* degrees should be issued “at the present time”.<sup>338</sup>

The ERB also sought the Institution’s views, and the Executive Committee discussed this matter under the heading “Alien Refugees”. In both world wars New Zealand had reacted with defensive xenophobia towards such refugees (and even to New Zealand-born members

of distrusted communities), interning the most ardent on Matiu/Somes Island in Wellington Harbour and denying others access to jobs and influence on the basis that they *may* be disinclined towards the British and allied cause. The University of New Zealand eventually decided not to accept Ziffer's request.

Qualified engineers from among the refugees also applied to join the NZIE. Two Hungarian engineers, Stephen Alexander Vincze (1902–1985) and George J Kerekes, had applied by Christmas 1939, both having been in New Zealand for less than a year. Vincze was a graduate of Vienna and Budapest universities and cited his election as an Associate member of IEE as proof of his professional integrity (though five years with the “celebrated” Ingenieur-Bureau of Dipl Ing Aurel Reiseinger in Budapest may have been more credit-worthy).<sup>339</sup> Both men submitted professional papers in support of their applications, and Vincze was registered by the ERB.

A reply from ICE to the earlier enquiry had not yet been received when, in March 1940, the Executive Committee approved a motion of Leslie Hutton (1889–1972) and Newnham that the election “of all non-British citizens be deferred until after the war”. President Edward Hitchcock suggested a liberalisation of this, moving a motion that the Institution could wait until it heard how other bodies were handling such applications before deciding.<sup>340</sup> Hutton and James Marchbanks (1862–1947) reacted adversely to this and over the next couple of months agitated to have Hitchcock's amendment rescinded. Marchbanks orchestrated a ballot of all 16 members of the Council on the issue.

As well as knowing of their professional qualities, the Executive Committee wanted the supporters of these applicants to emphasise “the actual extent of their personal knowledge of the candidates”, such was the suspicion of them.<sup>341</sup>

Meanwhile, ICE had replied on how it was dealing with Continental diplomas. Ordinarily, it made no distinction based on nationality, so long as all candidates met the same requirements. However, no non-British qualification was recognised as exempting the candidate from sitting any of the Institution's examinations, if these were felt to be necessary. But candidates with engineering achievements of such magnitude who were felt able to advance the state of knowledge had been elected to full membership of ICE without having to sit additional examinations. These, the ICE Secretary added, are “naturally... few in number”.<sup>342</sup> ICE had no policy on excluding foreign engineers, but also presumably had no applications from German or axis refugee engineers since the War begun. The views of IMechE and IEE were then also sought.

A work colleague, Edric Collingwood Creagh (1882–1965), and others supported Vincze's application, saying he had been employed in 1939 by the PWD hydro-electric branch and showed competence in his work. Though Creagh could not vouch for Vincze in any other way, he pointed out that the Governor-General had approved the PWD appointment and that the Customs Department had been satisfied with Vincze's *bona fides* before he was

allowed into New Zealand.<sup>343</sup> While his Hungarian countrymen in Europe fought alongside Hitler's troops, Vincze was getting involved with the Young Men's Christian Association, and wielding not a gun but a violin which he played in church and on the radio.<sup>344</sup>

By mid-1940, the idea of admitting any foreigner, not just enemy aliens, had been thoroughly knocked out of the Institution's mind. This was aided by recent disclosures in Europe, probably relating to the fascist sympathies of elements in erstwhile ally France, which was soon to sign a collaborationist pact with Germany in the town of Vichy.<sup>345</sup> But the parochialism extended to Britain's extended family: ICE still did not recognise the examinations set by ICE (India) and ICE (Ireland) was a distanced relative.<sup>346</sup>

A similar lack of welcome occurred initially in other fields such as medicine and architecture. "Alien" medical students were barred from studying at the University of Otago for the duration of the War. The British Medical Association brought pressure to bear on the University Council (and indirectly on the Customs Department) to prevent foreign doctors practising. Architects had less trouble working in New Zealand, but still had to sit local exams if they wanted to join the NZIA, though eminent architects like Ernst Plischke (1903–1992) chose not to.<sup>347</sup>

Most of the engineers who were denied membership of the NZIE during the War had genuine professional intentions and joined afterwards. Sixteen refugees were recorded working as engineers in 1945 (compared to 14 architects and 34 doctors).<sup>348</sup>

Both Siegfried Rothmann (1908–1985) and Bruno Rosenberg (1914–1990) were in this category, having worked during the War as public servants (albeit as draughtsmen, a level well below their professional capability).<sup>349</sup> Vincze even offered the NZIE a paper relating to his electrical engineering work (which was declined) but joined later, as did Ziffer.<sup>350</sup>

Since the 1990s, New Zealand has witnessed another wave of "alien" engineers, including immigrants and refugees from strife-torn nations particularly in the Third World and Eastern Europe. By 1997, 9,000 had arrived and "had completely swamped the market" as well as local welfare services and university faculties where they hoped to gain local qualifications.<sup>351</sup> The response, however, has been entirely different, with IPENZ liaising with agencies to improve the help offered, encouraging employers and running courses. In 2003, a Special Interest Group for Immigrant Engineers was formed "to facilitate immigrant engineers' settlement into meaningful professional employment in New Zealand", through "training, professional development, employment/career counselling and social and professional networking opportunities".<sup>352</sup>

## CENTENNIAL ENGINEERING AND A MEDAL

A bright light somewhat lifting the gloom of the War in 1940 was the Centenary of the signing of the Treaty of Waitangi. It celebrated the very development of New Zealand, as evidenced by its popular journal title, *Making New Zealand*.<sup>353</sup> The NZIE intended its contribution

to be a New Zealand centennial engineering congress and started planning in 1938.<sup>354</sup> All Commonwealth engineering organisations were invited, and leading New Zealand engineers were shoulder-tapped to contribute. The hope had been to publish the papers in advance to stimulate discussion.<sup>355</sup> The congress would be the biggest world gathering of engineers.

However, only four days after the outbreak of war in September 1939, the Executive Committee cancelled the congress. The “impossibility of attendance of engineers who were expected from overseas” was the main reason, but it was also “in view of the war”.<sup>356</sup> It soon became obvious that members in New Zealand, whether military personnel or civilian, were going to be very busy specifically with war work, or with keeping the country functioning with limited resources.

The Institution’s own AGM occupied the time and venue reserved for the congress. Had the congress gone ahead, it would have been “a unique gathering in New Zealand’s engineering history”.<sup>357</sup> Even the planning for it enhanced global communications and smoothed the way for the first post-war engineering conference, held in 1946.<sup>358</sup> New Zealand continued thereafter to be an active attendee at international engineering meetings.

A commemorative bronze medal was being struck to award to congress speakers. Having cancelled the congress, the NZIE decided to retain the medal, suitably modified. It would still be sent to the speakers invited to the congress but would also be awarded to authors of papers “of sufficient merit” accepted for the 1939–1940 volume of *Proceedings*.<sup>359</sup>

## YOUNG ENGINEERS CALL FOR A SHAKE-UP

In 1940, a group of “Young Engineers” wrote to the Institution with some ideas.<sup>360</sup>

Under 34-year-old John Burgess Rowntree (1906–1986), an unregistered PWD engineer, the group had held a few meetings in Wellington and claimed to be “most of the younger members of the Institution”.<sup>361</sup> Their aim was to make the NZIE more representative. They felt it was “not taking sufficient steps to raise or... maintain the status of the profession”, a “regrettable” state of affairs.<sup>362</sup> The NZIE had long been said to be unrepresentative of the younger technician or journeyman just starting a career.<sup>363</sup>

The group’s criticism was largely about status and salaries. The value of membership was too low – for example, it was not on the Public Service Classification List as something to aspire to.<sup>364</sup> Insufficient publicity was given to activities which could raise the profession’s public profile, and no attempt made to “arrest the flow of engineers overseas”.<sup>365</sup> Older members were said to value too much the “home Institutions to the detriment of both the status and membership of our own”.<sup>366</sup> A cutting criticism was that the legislation for registration of engineers was incomplete. Younger members’ views would get more consideration, they said, if they were appointed to the Council. The group admitted to some impatience but added that “in this age technology is responsible for a tremendous accelerated temp[o] of change, and that the Institution should keep pace with or even anticipate these changes”.<sup>367</sup>

## AN EVOLVING ORDER

The October *New Zealand Electrical Journal* referred to “urgent problems” in the NZIE.<sup>368</sup> Graduate member Nigel Stace (1915–2001) admitted penning this, which highlighted a drop in students to just seven per cent of members. This, he said, produced an “unbalanced organisation” with little voice for younger members (particularly among the Corporate members). Also, the enduring emphasis on the parent institutions was detrimental to the standing of the NZIE and required engineers to belong to both. Later, the young members’ group noted that Canterbury College graduates were advised by the School to join “a British engineering Institution in preference to the NZIE”.<sup>369</sup> Meanwhile, Stace was reprimanded for not getting “authentic information before publication”.<sup>370</sup>

Underpinning this was the aloofness of the Council. It met monthly but mostly to rubber-stamp the decisions of its Wellington-based Executive Committee. Also, much of the business conducted by the Council was regarded as confidential, making publicity of it difficult. Council (and most branch) meetings also did not admit reporters.

On the surface representation improved when branch chairmen automatically got a Council seat.<sup>371</sup> There were six branches in 1940 (Auckland, North Wellington, Wellington, Canterbury, Otago and Southland). To qualify for a Council seat, a branch had to have 100 members or could combine with a neighbour (from this, four branch chairmen attended the Council). But this change in representation was to counter another recent rule change – that branches could no longer discuss the management of the Institution. The Wellington Branch had been particularly interested in discussing administrative matters. Rule 64 not only shut a door to branch involvement in internal matters (other than through their chair at the Council) but over the next couple of years it pushed some younger members to take their discussions about the Institution elsewhere.<sup>372</sup>

The age of the councillors was an issue. The Executive Committee that received Rowntree’s letter, for instance, ranged in age from 51 to 77.<sup>373</sup> Furthermore, according to the rules for admission, youth had no vote on Institution affairs until elected to Associate membership at 25, and full Corporate members were 35 or older.

It was thought that members were also on the Council too long. Originally, a third of the Council had to retire each year, increased in 1938 to half. Even so, “[i]t was claimed, with considerable justification, that the older members of Council were holding on to office too long and that their conservative and, at times, intolerant attitudes were having a detrimental effect on the administration of the Institution”.<sup>374</sup>

The establishment reacted defensively to the young group’s letter. After discussion by the Executive Committee, Harold Cole sent it to all councillors with a rebuttal of most points. The Secretary also compiled intelligence on the group. He listed 13 names, and their dates of birth. All had been elected to Student, Graduate or Associate membership since 1932, and were aged from 26 to 41. Five, however, had joined only in 1939, aged under 33, representing a newer more determined brood. Their actions were regarded as “protest”.<sup>375</sup>

Members of the Council met the young group twice in November. Only two days before this, the Secretary had received a copy of another statement from the group, which had been written by JF Bruce from the PWD design office and sent in October to branches but not the national office. It placed more emphasis on getting a young representative elected to the Council in the next AGM. It talked of a central committee and sought donations to help form it.<sup>376</sup>

The Institution's President, Alfred Baker (1881–1943), found this to be “unusual and objectionable”.<sup>377</sup> However, on the issue of status (or income) of young engineers agreed, citing the salary bar in the Railways Department and other impediments to engineers in the Post and Telegraph Department. These were to be taken up with the Public Services Commissioner.

Rowntree believed the NZIE should be “a real live body with a real live impact on engineering”.<sup>378</sup> The young group wanted to widen the Institution's objects. The subsequent President, Edward Hitchcock, talked of “the *mana* of any Institution” as a “subtle characteristic”, that can only be:

progressively established.... This recognition must be merited and not forced. Normally it is initially established, contributed to, and will be finally determined, more by conduct and bearing and atmosphere, and other intangible but very real characteristics of a professional body, rather than by demands. The engineer has a contribution to make to the organization. What he gains from it is less a return than an imprimatur [approval]. Possibly this is expressed by the suggestion that it is ‘prestige’ rather than ‘status’ that the Institution might be capable of conferring.

He thanked the young group for not voicing their protest loudly in public, a tactic he said would “lose this fruit [of prestige] in the endeavour to pluck it”.<sup>379</sup>

Hitchcock saw the loss of young engineers overseas as a “sallying forth”, one of the “characteristics inherent in our country” that had to be accepted as “evidence of virility”. Fewer young graduates would flock overseas if salaries were higher in New Zealand, a situation that would follow an elevation in status which the Institution was working towards. But a colonial cringe still existed – Drummond Holderness saying that to “employ all New Zealand trained engineers locally would inevitably lead to a lowering of the status of the profession here”. This “small country attitude of self-deprecation” led to suggestions for a Royal Charter but also later enhanced the reputation of New Zealand-trained engineers – through a stubborn and growing sense of independence.<sup>380</sup>

After their two meetings with the group of young members, the Council put out a special printed memorandum to all members in December 1940 refuting the young engineers' manifesto. Hitchcock said that, as many members were absent overseas on active service, the reformers' action were “untimely”. It said the youngsters' concerns were not about furthering the profession but over the “material interests of engineers, somewhat disguised under the term ‘status’”. The memorandum deplored the idea of personal canvassing for election to the

Council, which it said was “contrary to the spirit and practise of professional bodies” and that age and sectional interest were the preferred qualification for service on the Council.<sup>381</sup> Hitchcock concluded that the Council’s dual responsibility was to implement the wishes of members and safeguard all that the Institution stood for. This meant opposing “a small section” striving “for an apparent gain, [which] may result in ultimate loss to the great body of members”.<sup>382</sup>

Rather than harnessing the zeal of the younger members, the establishment saw it as “enthusiasm outrunning mature consideration”.<sup>383</sup> The group’s desire to form an engineers’ guild was further discussed, though the Council kept it off the agenda for the next AGM.

The Council and the young group met again in April 1941. No formal reply would be made to the group’s statement but they were given leave to study the possibility of a monthly journal as opposed to the current quarterly *Bulletin*.<sup>384</sup> The young group was not sated by this.

### **BREAKING AWAY: THE PROFESSIONAL ENGINEERS ASSOCIATION OF NEW ZEALAND**

Less than two years later the group headed by Rowntree got 21 signatures to petition the NZIE for an SGM to make the Council more representative.<sup>385</sup> A committee on the status of the profession was established at the 1943 annual conference, a direct result of the young engineers’ agitation. It suggested limiting a member’s term on the Council to six years.<sup>386</sup> This was still being discussed when the young engineers and other groups gave up trying to change the NZIE.

A group, calling themselves Professional Engineers, met in Wellington in July 1943. It claimed the engineering profession could give “far greater service to the nation than is now the case”.<sup>387</sup> The committee of vigorous young men met weekly thereafter. PEANZ formed in August and circulated a constitution the following year.<sup>388</sup>

The Association paid tribute to Edward Hitchcock’s 1941 NZIE presidential address, entitled “The Engineer and Humanities”. Though calling it “a trite observation”, it underpinned the ethics of the new body.<sup>389</sup>

The group defined a professional engineer as technically competent, of unimpeachable moral character, possessing a sound education with evidence of learning in at least one direction. Primary objectives must be intellectual and altruistic, and the person trustworthy.<sup>390</sup>

Despite what must have seemed a red flag to a bull, the NZIE reacted calmly. It did not feel threatened, possibly because the discussion in 1940 had vented some of the hotter steam. When later in the year PEANZ requested to use the NZIE’s Council rooms for administrative meetings, this was granted providing that the fact was not advertised.<sup>391</sup>

The NZIE had been exhorted by PEANZ to take a greater interest in trades training and rehabilitation of ex-service engineers, encourage more research on New Zealand-specific

problems, and be more in contact with allied professions. They all longed for the amendment to the ERA which was before parliament but not yet law. The NZIE had standing committees on rules, house, finance, publications, library and education, but PEANZ recommended more on statistics, technical, life and work, and public relations. Members from outside the Council could sit on these committees, giving the NZIE the benefit of wider representation and a “cross-sectional balance of thought”. The life and work and public relations committees were felt to be urgently needed.<sup>392</sup>

Members of the Institution generally received PEANZ proposals as being to increase the status and salary of the engineer, and generally agreed with it in principle.<sup>393</sup> However, few saw much value in two organisations in a country as small as New Zealand. The less charitable, such as Frederick Furkert, saw PEANZ as part of a “socialistic tendency apparent in New Zealand” and derided it for its focus on money irrespective of quality of service.<sup>394</sup> Others agreed that money should be a focus when a newly-qualified engineer earned £280 per annum in the PWD whereas a dentist in private practice commanded £500.

What really worried the Institution was PEANZ’s growing membership – over 300 by early 1944. To avoid any suggestion of competition between them, PEANZ modified its objective to “safeguard and improve the status and economic interests of Professional Engineers and to promote and ensure the highest standard of professional service”.<sup>395</sup>

In planning for PEANZ, its provisional Chairman Rowntree met with NZIE President John Lancaster (1883–1950) about their respective goals. They agreed PEANZ was a protective body with the aim being the advancement of engineers; the Institution, in contrast, would stick to its “high ideals”, the advancement of the science of engineering, instead of engineers.<sup>396</sup>

In practice, this limited how much the NZIE could intervene on behalf of members. It could act in connection with principles (such as when the Army employed engineers on non-technical work) but not on behalf of individuals. Its support for individual members in public battles had been mute so far, so this was no real change.

In April 1944, PEANZ hired a part-time Secretary, Colin Gillett (1904–1976). The provisional Council was replaced later in 1944 by an elected Council. PEANZ was incorporated in July 1945.<sup>397</sup> Initially, it was charged £1 a night for NZIE offices but soon moved to the Medical Association’s rooms at the same rate.<sup>398</sup>

Support for PEANZ grew. Its second AGM in 1945 was attended by 200 members, whereas the NZIE’s only drew 170. Both meetings were in Wellington in the same week, many members attending both. PEANZ’s, however, was described as “one of the largest gatherings of engineers ever held in Wellington”.<sup>399</sup> PEANZ’s membership climbed steadily, with nine branches formed around the country by February 1945. PEANZ membership surpassed the NZIE’s in 1946 and for several years thereafter.

## AN EVOLVING ORDER

Cool heads prevailed and “the fear expressed” when the Association was first discussed “proved groundless”.<sup>400</sup> Only one member was said to have resigned from the NZIE over the PEANZ split. A demarcation of duties was adopted by both organisations, though PEANZ did not stick to this. They started lobbying on the topic of the Model Building Bylaw, and local authorities employing non-qualified men as borough engineers, both issues once handled by the NZIE.<sup>401</sup> To keep their relationship on track a PEANZ/NZIE liaison committee was established in April 1946.

The Association and the NZIE soon settled into a pattern, including coinciding their annual meetings.<sup>402</sup> This opened the question as to why they both existed, and talk of their coalescing started.<sup>403</sup>

The outcome for the Institution of the PEANZ affair was accepting the need to increase membership, especially among younger engineers, and being more responsive. The aim was to encourage “prospective members to join the Institution at a comparatively early stage in their training and advance step by step in their membership status as their education, training and experience dictate”.<sup>404</sup> By 1948 this was increasingly happening, clawing back in small measure the gains PEANZ had made.

From this also, the NZIE entered the post-War period with a renewed theme of public service.<sup>405</sup> It also decided to be more proactive. At the 1948 Dunedin annual conference, President Leslie Hutton said:

[t]he main and bluntly devastating fact is that the engineering profession is so necessary to the well-being of the community, and has hidden its light under a bushel for so long, that the community has taken the profession for granted. The perfection of the services the engineer has provided is a factor which contributes more than any other towards the eclipse of the engineer in professions. Its victories pass unnoticed, and are seldom acclaimed, but its defects are double-typed on the front page of the newspaper.

Hutton continued, noting that “[t]he profession lacks its fair share of approbation” when compared with doctors, dentists or lawyers.<sup>406</sup> He determined to change that.

## NEW ZEALAND ENGINEERING MAGAZINE

The end of the War brought a plethora of military-related papers from members on engineering aspects of campaigning overseas and in New Zealand.<sup>407</sup> These were published in *Proceedings*, which contained only papers presented at annual conference (not branch meetings) and were produced at a “ruinous” cost – about a third of the Institution’s income.<sup>408</sup> *The Bulletin* appeared more frequently but had little more than lists of councillors and standards, and did not change the perception of the NZIE’s publications as tardy and unwieldy.

PEANZ stirred things up in the publications arena with a new magazine. Its journal, *The Professional Engineer*, first appeared in 1945. It was small in format but not in impact. It came out monthly and raised valuable income through advertising, something long rejected

by the NZIE. It prompted the NZIE to review its publications.

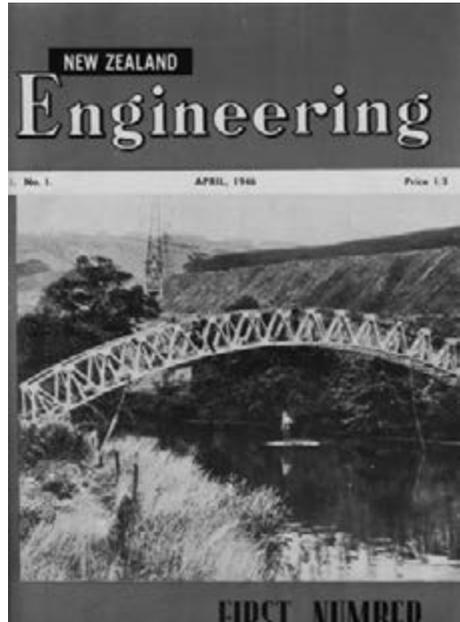
A chance meeting on Queen Street in Auckland got the ball rolling. President Newnham bumped into Nigel Stace. Stace worked for Technical Publications Limited (TPL) as the editor of the *New Zealand Electrical Journal*. Owners Edgar and Mabel Swain had published it for 18 years (officially since 1940 for the New Zealand Institute of Electricians Incorporated and later the ESAEANZ). Newnham and Stace's conversation led the Institution into talks with TPL, who agreed on the need for a broader journal on engineering. Critical mass was reached through the inclusion of a third smaller partner, the six-year-old New Zealand Institute of Welding. *New Zealand Engineering* was born.

The Institution sold TPL copyright to around 100 unpublished technical papers awaiting a slot in *Proceedings*. The Institution would contribute 16 of the 48 pages, the welders eight, and advertising would occupy the rest. The first issue in April 1946 was a bumper 84 pages (and would soon peak at 112 pages). Stace would be the editor, working with the new NZIE Publications Committee, as well as continuing with the *New Zealand Electrical Journal*. The NZIE would buy copies each month for its members, the rest being commercially available.

As the new face of the Institution, *New Zealand Engineering* defined its public persona for many decades.

*New Zealand Engineering* soon themed each issue on topics such as building materials, constructional techniques, sectors of industry or branches of engineering. Initially, summaries of engineering issues were published and the journal had a pleasant balance of professional, in-house and topical material. Editorials were commissioned by the publisher from anonymous writers.

A 10-year agreement was signed in 1952 in which *New Zealand Engineering* became the official journal of the Institution. The Institution's Publications Committee again controlled content. While the major articles reverted to the heavier technical stuff of *Proceedings* (which was ingloriously discontinued at the same time, after nearly four decades), editorials remained the responsibility of TPL.



Cover of *New Zealand Engineering*, Volume 1:1 (April 1946).

The editorial in April 1953 criticised the Government's decision not to electrify the North Island Main Trunk railway. The *New Zealand Herald* mistakenly attributed this criticism to the NZIE and thus upset the General Manager of New Zealand Railways, Horace Lusty (1895–1972), a past President of the Institution. “The editor was summoned to wait upon the [NZIE] Council for reprimand, but after waiting nearly one hour, was very diffidently informed by the Secretary... that the council saw no point in a reprimand, but would in due course issue directives covering future editorials.”<sup>409</sup>

The 1954 NZIE conference insisted that the editorials become lead articles “of interest to anyone and offend[ing] no-one.”<sup>410</sup> In reality, the Chair of the Institution's Publications Committee (initially another past President, Leslie Hutton) started writing editorials, which were never again to be anonymous.

Greater institutional control also led to a rise in long, dry, technical articles (from 20 per cent by content in 1950 to 75 per cent in 1956). To counter this, more pithy columns were introduced including “Notebook” from 1962, the “Secretary's Newsletter” (1966), “Blue Pages” (1968) and “Noteworthy” (1972). A separate series, “Transactions of NZIE”, appeared from 1974 to carry technical papers, leaving *New Zealand Engineering* to revert to sectoral coverage. A newsletter, called *Print-Out*, appeared for NZIE members in 1978.

Stace remained the editor until 1980, and was credited for the quality of *New Zealand Engineering* and its role as the Institution's voice. He edited many other similar technical journals and contributed a youth voice to the Mazengarb Report.<sup>411</sup> The Institution voted him a Distinguished Fellow a week before his death at age 85.<sup>412</sup>

Another engineer to turn wordsmith, Brian Cashin (1931–2011) was one of a number of Assistant Editors who worked on *New Zealand Engineering* (in 1959–1962 and 1963–1968). He is notable for having “mercilessly and even contemptuously denounced” many engineers for the poor standard of their written language. He said they were condemned by grammatical errors which would “disgrace a 5th former. Weakness of sentence structure would often result in double-negatives.”<sup>413</sup>

*New Zealand Engineering* continued to service the Institution's needs well, and the relationship survived the introduction of *New Zealand Engineering News* in 1970, also by TPL. This was intended as an adjunct to *New Zealand Engineering* but even so, after all members received the first copy free, 20 of the more loyal refused to have anything to do with it.<sup>414</sup>

## WHOLE AGAIN: THE NZIE AND PEANZ MERGER

Meanwhile, in New Zealand a very long debate had ensued on the future development of professional engineering bodies. This was code for how to get PEANZ back into the fold. Amalgamation was the logical answer and formal talk of reuniting started in the mid-1950s as membership of PEANZ fell to below that of the NZIE. *The Professional Engineer* even published a motion in 1955 to dissolve PEANZ into the NZIE (it was not passed).<sup>415</sup>

In 1956, those who belonged to both PEANZ and NZIE accounted for 70 per cent of the combined membership. The 300 PEANZ members who were not dual members would have been mostly technicians, while the 400 NZIE members who were not dual members would mostly have belonged to the parent institutions, confirming the perception that “one is more academic than the other”.<sup>416</sup> The NZIE was less keen in wanting to represent technicians.

The two bodies formed a joint committee to discuss their future, and publicly agreed on the demarcation between their roles. The NZIE’s was education, training, technical standards for practice, and the advancement of the science of engineering. PEANZ’s role was status, economic conditions and professional practice, and jointly they covered the code of ethics and public relations.<sup>417</sup> Some NZIE members continued to lobby for re-integration, doing the whole job from one platform. From “amalgamation” discussed in 1956, the talk in 1958 was of “integration”, combining the best elements of both, but in the end PEANZ capitulated to the NZIE and agreed to assimilation under the NZIE name.

The matter became contentious in meetings. Some remember the meetings as tense and grave: others more light-hearted. Mike Williams recalls Hansen and President Walter Gordon Morrison (1903–1983) having a “head-to-head” at the 1959 annual meeting in Christchurch. Hansen said employers would not support an amalgamated body, to which Morrison shouted that he was talking “a load of Bull” – Hansen’s nickname. Everyone roared.<sup>418</sup>

Both bodies put the issue to a referendum. The NZIE’s vote in favour of amalgamation was 57 per cent, PEANZ’s 77 per cent. The highest vote in favour was from the non-NZIE members of PEANZ (mostly technicians), 91 per cent of whom favoured getting into the Institution through this back door. And conversely, only 27 per cent of the non-PEANZ members of the NZIE wanted anything to do with them.<sup>419</sup> PEANZ’s 14 branches melded with NZIE branches or withered.

The NZIE agreed to keep *The Professional Engineer* and PEANZ staffer John Kean, but his editing role soon went to NZIE Secretary Douglas Bedingfield.

From June 1959 and issue number 173, *The Professional Engineer* became *The News Bulletin of the New Zealand Institution of Engineers*. It moved to the NZIE’s old supplier, TPL,



*Douglas Bedingfield being presented an address by NZIE President Arnold Downer, NZIE Jubilee Conference, 1964.*

*IPENZ Collection.*

though Garrett Printing was retained. *New Zealand Engineering* became the Institution's *Proceedings* again and consequently the New Zealand Institute of Welding's section was reduced to two pages.<sup>420</sup> As already known, keeping two going at once was more effort than justified – and *The Professional Engineer* ceased publication in 1965.

## ENDNOTES

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 308 *Procs NZIE 1938-39*, 32.  
 309 *Ibid.*, 37.  
 310 Galbraith in *Procs NZIE 1938-39*, 36.  
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 313 *Ibid.*, 18 December 1939.  
 314 *Procs NZIE 1939-40*, 21.  
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 316 *Ibid.*, 17 December 1941, 14 January 1942.  
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 318 SR, n.d. [November 1943?]. 'Train Smash,' *Evening Post*, 11 November 1943, 6.  
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 326 *Bulletin and Procs NZIE*, 15 July 1944, 109.  
 327 McRae, *New Zealand Institute of Surveyors*, 354.  
 328 'The Engineer Registration Amendment Act 1944,' Section 8. The Knowledge Basket, URL: <http://legislation.knowledge-basket.co.nz/gpacts/reprint/text/1924/am/016am2.html>. *Bulletin and Procs NZIE*, 1 October 1944.  
 329 *Bulletin and Procs NZIE*, 1 July 1944, 136.  
 330 *Ibid.*, 1 October 1944.  
 331 'Registration Plan for Civil Engineers,' *Auckland Star*, 29 November 1944, 4.  
 332 *Bulletin and Procs NZIE*, January 1945, 2.  
 333 Figures quoted by Semple, 'Registration Act,' *Evening Post*, 28 July 1945, 9.  
 334 McRae, *New Zealand Institute of Surveyors*, 356.  
 335 *Ibid.*, 357.  
 336 'Work of Architects,' *Evening Post*, 1 December 1945, 9.  
 337 Ann Beaglehole, *A Small Price to Pay: Refugees from Hitler in New Zealand 1936-46* (Wellington: Allen and Unwin, 1988), 1.  
 338 Quote in EC Minutes, 13 December 1939, 2.  
 339 'Stephen Alexander Vincze,' *NZE* 26:3 (March 1971), 78. By 1971 Vincze was also a member of the British Nuclear Energy Society and had published 56 papers in three languages in half a dozen countries. A Czechoslovakian, Bruno Saborsky, applied early in 1941, also unsuccessfully. EC Minutes, 10 January 1940. EC Minutes, 26 March 1941. ERB Register No1, entry 1019, 20 May 1940, reference 1611.  
 340 Quote from EC Minutes, 19 March 1940, 2, 24 April 1940. Council Minutes, 12 June 1940.  
 341 EC Minutes, 19 March 1940, 2. Emphasis as in original.  
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 343 EC Minutes, 24 April 1940.  
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- 358 Ibid.
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- 360 EC Minutes, 30 October 1940.
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- 362 Rowntree to NZIE, 18 October 1940.
- 363 Mr Barr, *NZPD*, vol.204, 24 September 1924, 1098.
- 364 This was achieved in 1956. EC Minutes, 16 April 1956.
- 365 Rowntree to NZIE, 18 October 1940.
- 366 Ibid.
- 367 Ibid.
- 368 *New Zealand Electrical Journal*, 25 October 1940, 336.
- 369 Minutes, 13 November 1940. Minute Book 1940-41.
- 370 Minutes of Meeting of sub-committee of Council and members of "a group of young engineers," 13 November 1940. Minute Book 1940-41.
- 371 Hitchcock to Rowntree 14 November 1940. Minute Book 1940-41. Newnham, *Learning Service Achievement*, 319.
- 372 Newnham, *Learning Service Achievement*, 56. As adopted in February 1938, this rule said "No question shall be raised or motion made at the ordinary meetings relative to the direction and management of the concerns of the Institution, such management being vested in the Council subject to the control of the bylaws and of the resolutions of general meetings." Rule 65, Section XI, Procedure of Meetings. *Procs NZIE 1938-39*, 243. Later Council could direct a lesser meeting to discuss a specific matter. *Procs NZIE, 1946*, 88.
- 373 NZIE to MOD, 22 November 1940. Minute Book 1940-41. Alfred Baker (President) was 58 and Cole was 60 at the time. The ages of the other council members were: Marchbanks 77, Cable 66, Kissel 59, John Lancaster 56, Newnham 52, Hutton 51 and Harry Smith 51.
- 374 Newnham, *Learning Service Achievement*, 319.
- 375 Lancaster at 1944 AGM, *Bulletin and Procs NZIE 2* (July 1944), 99.
- 376 SR 16 November 1940. They met on 13 and 19 November 1940.
- 377 Minutes of Meeting of sub-committee of Council and members of "a group of young engineers," 13 November 1940. Minute Book 1940-41.
- 378 Minutes of Meeting, 19 November 1940. Minute Book 1940-41.
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- 380 'NZ engineers are ignored,' *Evening Post*, 18 July 1964. JC North, Chairman of the Consulting Engineers Division of NZIE, said "[t]his reflects our small country attitude of self-deprecation. As long as I can remember, in New Zealand overseas experts have been reckoned superior to our own".
- 381 Hitchcock to All Members of the Institution, 6 December 1940. Minute Book 1940-41.
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- 383 Hitchcock to Secretary, 3 December 1940. Minute Book 1940-41.
- 384 EC Minutes, 23 April 1941.
- 385 Petition, 25 January 1943. Minute Book 1942-43.
- 386 *Bulletin and Procs NZIE 2* (July 1944), 93.
- 387 Report of a committee appointed by a group of professional engineers who met in Wellington on 13 July, 1943, on 'The Responsibilities and Opportunities of the Engineering Profession of our Time.' [n.d.]. Sent to NZIE. EC Minutes, 27 October 1943. *Bulletin and Procs NZIE 2* (July 1944), 95.
- 388 *The Professional Engineer (TPE)* (25 May 1957), 939.
- 389 'Report of a Committee,' 1. *Bulletin and Procs NZIE 1941* 1, 43.
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- 391 EC Minutes, 29 September 1943.
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- 393 *Bulletin and Procs NZIE 2* (July 1944), 92.
- 394 Ibid., 95.

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- 395 Ibid., 99.
- 396 Ibid.
- 397 Newnham, *Learning Service Achievement*, 58.
- 398 EC Minutes, 4 December 1946, 4.
- 399 Quote in 'Registration Act,' *Evening Post*, 16 February 1945, 6. 'Engineers Confer,' *Auckland Star*, 14 February 1945, 3.
- 400 *Procs NZIE 1946*, 15.
- 401 Council Minutes, 19 February 1946.
- 402 EC Minutes, 24 April 1946.
- 403 EC Minutes, 24 July 1946, 3.
- 404 *Procs NZIE 1948*, 13.
- 405 *Evening Post*, 19 February 1946.
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- 407 Authors including AG Bogle, GE Breeze, Edward Cressy, RG Drummond, GA Lindell, Newnham, Rowntree, J Kelvin Scott, Trevor Smith, ME Theatre, Toogood, and CWO Turner produced papers on military engineering related topics published in the *Procs* between 1944 and 1948.
- 408 Newnham, *Learning Service Achievement*, 59.
- 409 'New Zealand Engineering (1946-1980),' *NZE* 35:2 (February 1980): 26. 'Agreed - To Disagree,' *NZE* 8:4 (April 1953), 121. Francis D Wootton, *There Was a Tide: The History of Technical Publications Ltd 1928-1989* (Wellington: Bearfax, 1992).
- 410 'New Zealand Engineering (1946-1980);' 27.
- 411 Obituary, *Evening Post*, 8 March 2001. 'Obituary Nigel Stace,' *e.nz* (May/June 2001): 50-51. Redmer Yska, *All Shook Up: The Flash Bodgie and the Rise of the New Zealand Teenager in the Fifties* (Auckland: Penguin, 1993).
- 412 'Eulogy for Nigel Stace, Presented by Robert G Norman...' 13 February 2001.
- 413 Cashin quoted from the NZIE conference in Auckland. *Evening Post*, 15 February 1961. 'New Zealand Engineering (1946-1980);' 27.
- 414 Wootton, *There Was a Tide*, 33-34.
- 415 *TPE* 123 (March 1955), 72.
- 416 Quote in *Evening Post*, 9 February 1954. *NZE* 12:4 (April 1956), 113. In 1957 PEANZ said the common membership was 1100 out of 1500 of each body, around 64 per cent. *TPE* 149 (May 1957), 939.
- 417 'Joint Statement...,' *TPE* 155 (November 1957), 142.
- 418 Mike Williams interview with author, 29 January 2013.
- 419 *TPE* 168 (January 1959), 490. NZIE's total roll was 1419 and PEANZ's 1169, of whom 894 were members of both - 63 per cent of NZIE's and 76 per cent of PEANZ's members.
- 420 Wootton, *There Was a Tide*, 23.

## CHAPTER 5

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# 1960s TO 1970s

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### **PUBLIC RELATIONS**

The merger with PEANZ in 1959 led to a restructure. Reporting to the 30-person Council were now four principal committees. Three were permanent Executive Committees covering professional qualifications, engineering science and professional practice. To chair them, three new Executive Vice Presidents were created. Each committee had up to 20 members, half of whom were ex-officio. They had a large number of sub-committees on specifics. The fourth dealt with administration (and added the rules sub-committee in 1960).

Under the Executive Committee on professional qualifications were the Membership Admissions, Education, Training and Examinations Sub-committees. Professional Practice had Legislation and Public Relations. The Engineering Science Executive Committee had the very busy Publications Committee and a dozen technical committees. These were on specialist subjects, and sometimes had a short lifespan as well as representatives from other bodies.<sup>421</sup>

Many of the branches (14 in 1960) also had their own sub-committees on similar subject areas. There was plenty of scope for members to gain experience and exposure volunteering in their professional capacity on one of these. A Building Committee was added under the Council in 1963.

Externally, the NZIE was represented in 10 other organisations and had a representative on the Standards Council and up to 30 standards committees.<sup>422</sup>

In 1960, the Administration Committee looked at the Institution's public profile. It considered getting the NZIE incorporated by statute (as were the surveyors and architects) and adding a coat of arms to help sell the body. Hiring a public relations professional was agreed to but a self-deprecating attitude pervaded.<sup>423</sup> Against "sweeping criticism levelled at members of the profession in the press from time to time, ... it is felt that the Institution itself

cannot effectively issue press statements on highly controversial subjects". Symposia and Dobson lectures were seen as appropriate public relations tools.<sup>424</sup> Branch work in this area was vital. "The Council believes that status [of engineers] is not entirely a matter of salary and position, but is closely related to the standing of the individual in his local community, the part he plays in local and public affairs and the degree to which he is accepted as a person of consequence."<sup>425</sup> The Auckland Branch was also authorised to engage a public relations consultant to advise how to raise the profession's profile.

The NZIE hosted two major international events. The first of these, in February 1965, was the Third World Conference on Earthquake Engineering. It was followed two years later by the Fifth Australian and New Zealand Conference on Soil Mechanics and Foundation Engineering.<sup>426</sup> For the earthquake conference, the Institution convinced the Government to spend £20,000 and it partly underwrote the latter event.

### INSTITUTION REGIONAL BRANCHES

The Council believed the success of the NZIE was connected to the strength of its geographically-based branches.<sup>427</sup> Rowntree effectively argued that "so much of the activity of the Institution took place in Branches" they should have the right to discuss "direction and management" of the Institution.<sup>428</sup>

Branches were a microcosm of the umbrella Institution and most also fostered scientific and technical interchange of information, through site visits and the presentation of papers. The bigger branches such as Wellington were even bringing overseas visitors here to speak, and publishing their own newsletters. Mentoring young engineers was also an important role.<sup>429</sup>

Branches provided an opportunity for social interchange too. Some conducted their business over a luncheon or drinks, and Wellington's annual ball at the Majestic Cabaret attracted hundreds of couples.<sup>430</sup> The Branch hosted the annual conference (still rotating among the four main centres) and put on dinners and visits in addition to the usual conversazione.

Combating insularity was important. Hugh Elder (1929–2007) admitted that "[m]any of us have opted for engineering because we find the concrete easier or more satisfying to deal with than the abstract, but as our careers develop we must deal increasingly with people...". The most important function of the Institution is as "a means of breaking down the cocoons we weave for ourselves.... We are a fragmented profession... in a fragmented society. There are too many people waving their purses at the piper. As a profession it is our job to get the band together. So that at least we get some harmony in the music."<sup>431</sup>

When members joined they did not automatically become a member of their branch. They joined that as a separate body, paying a separate (small) subscription for its programme of talks, social events and site visits. To increase the engagement with branches, a consolidated

membership was suggested, automatically giving branch as well as national membership. Smaller branches were initially sceptical but once their income was guaranteed, the change was passed (though two of the 15 branches still voted against it). Approved at a special meeting in October 1964, the measure came into force on 1 January 1965.<sup>432</sup>

Some branches undertook jobs on behalf of the Council, or initiated things that later went national. For example, the Wellington Branch held a special water symposium in December 1964 which influenced national developments (as had its National Roothing Symposium in 1961). Similarly, an Auckland planning seminar (“The New Zealand Countryside in 1980”) was a signpost to the future.

Of the 16 branches in the mid-1970s (Wairarapa was the newest), Auckland and Wellington had memberships of 1,100–1,200 each, with Canterbury and the Waikato/Bay of Plenty regions with 460–470. Most of the others were in the 60–80 range, but interestingly, 550 members – one-in-four of the NZIE membership – lived overseas.<sup>433</sup> The London Association formed as a branch in the mid-1960s.<sup>434</sup>

## **NZIE DIVISIONS AND THE ASSOCIATION OF CONSULTING ENGINEERS NEW ZEALAND**

While branches were regionally-based, divisions were occupationally-based. They brought together members with a community of interest through their fields of engineering. Members could engage with others employed as consultants, in local or central government, or in private firms or practices.

The government sector in the 1950s had increased its intake of engineering cadets and students as recommended by the McElwee Report. This gave the Government Service Division a boon in numbers.

Divisions had long existed for local body and public service engineers. A Municipal Division was fledged in 1962 from the Local Bodies nest to represent engineers in bigger councils, as distinct from rural councils or harbour, roads or water boards.<sup>435</sup> It opened valuable communications with the Municipal Association, at a time when it and the NZIE were discussing the municipal engineers’ role in relation to building bylaws.

A new Industries Division was established in 1968 (after meeting informally for two years), comprising engineers employed by private enterprise. Headed by Bernard Kemp (1920–2008), this “filled a sizeable gap” in the NZIE.<sup>436</sup> Within two years its membership had grown to 114 members, but it said 700 members of the NZIE were eligible to join but had not.<sup>437</sup> Attendance at its early events was initially disappointing and the NZIE tried to engage bodies such as the Institute of Production Engineers to enhance the division’s membership.<sup>438</sup>

Members in central or local government automatically became members of their respective division, but for consultants and private sector engineers it was optional.

## AN EVOLVING ORDER

With five divisions, a Combined Divisions Liaison Committee was formed in 1968, meeting with the Council on a regular basis. In 1975, the divisions had a total membership of 2,300 engineers, roughly half of the Institution's total. The Government Service Division was the most numerous, with 950 members, followed by local bodies with 450 and municipal with 400. The consultants then had 341 members, and the newest – the Industries Division – was still the smallest with 163.<sup>439</sup>

Consulting engineers were most often self-employed or running practices that employed staff. For this reason they did not always identify with the issues that affected engineers employed in the public sector or companies. When, for instance, the Institution and PEANZ were sorting out the demarcation between them in the late 1950s, the Institution's consulting engineers viewed matters from the perspective of an employers' association and thought of PEANZ as a trade union. There were consultants in PEANZ but the Consulting Engineers Division formed only after PEANZ was absorbed into the NZIE in 1959. Friction over fundamental issues encouraged the consulting engineers to later seek independence.

Consultants and employers were well aware of a shortage of engineers. The “brain drain” was already apparent, with The University of Auckland claiming that 25 per cent of its engineering graduates went overseas permanently. Low pay for engineers was routinely brought up, including by Consulting Division members who told the No.9B District Roads Board meeting in Tawa that its engineers and design staff were “grossly underpaid”.<sup>440</sup>

The consultants' annual conferences became high-profile events, hosted in resorts such as Wairakei or the Chateau Tongariro and attracting big names such as the Minister of Finance Robert Muldoon (1921–1992) a year before he spoke to the NZIE.<sup>441</sup> In 1969, the post of Director of Consulting Division of the NZIE was created and filled by John Graham Excell (1926–2008).<sup>442</sup> The following year the Consulting Division voted to become independent as the Association of Consulting Engineers New Zealand (ACENZ), in part to “assist the public relations image of the Division in its endeavours to obtain work on world markets, particularly in South East Asia”.<sup>443</sup>

As a parting shot, the NZIE drafted and published a Code of Professional Practice for Consulting Engineers in 1971.<sup>444</sup> However, there was not a complete separation – ACENZ would remain the Institution's consulting voice with an ongoing “Consultants Notebook” column in *New Zealand Engineering*.

That was the public line, but behind the scenes there was some friction. Long-time ACENZ member Steve Gentry (b.1933) recalls “the employing engineers were in business to make a bob, and they didn't want government engineers ramping up salaries” for those employed by them.<sup>445</sup>

The consultants were also better at backing themselves and regarding New Zealand engineers as world-class. An earlier head of the Consulting Engineers Division, John Charles North (1914–1979), said New Zealand had “a small-country attitude of self-deprecation. As

long as I can remember, in New Zealand overseas experts have been reckoned superior to our own. Yet when New Zealanders work alongside others they prove the opposite to be the case.”<sup>446</sup> Therefore, ACENZ advocated for greater use of New Zealand consultants by government departments and in overseas jobs.

With so much infrastructural work underway in New Zealand, the consultants were also often at odds with the Ministry of Works over how it should be done. A liaison committee was established to bridge the gap between them, and was especially successful under Robert (Bob) George Norman (b.1923). Consultants had to counter arguments that their involvement in engineering projects merely ramped up the price without a corresponding benefit.<sup>447</sup>

As of 2013, most consulting engineering firms are ACENZ members, but a good number of their employees remained members of the NZIE/IPENZ.

## FELLOWS AND MEMBERSHIP CATEGORIES

Another major change in this period was to the categories of membership. Until the 1960s, Member was the highest class an engineer could aspire to. The Institution had toyed with Associate Member and Associate as the lesser corporate category, confusingly having both through the 1940s and ’50s. In 1962, the Institution initiated change to elevate the reputation of professional engineers in New Zealand. Once confirmed in special meetings in February 1963, the senior category would henceforth be Fellow (FNZIE).<sup>448</sup>

The Honorary category became an Honorary Fellow (Hon FNZIE), someone not necessarily a current member but “who is distinguished by his work in engineering or science, or an otherwise distinguished person whom the Institution desires to honour”<sup>449</sup> In 1968, another category of Companion Member appeared (CompNZIE) for young non-engineers in a related responsible role, particularly in science.<sup>450</sup>

Interestingly, this was six years before ICE introduced a Fellow class of membership. In New Zealand, there was no stampede of applicants.<sup>451</sup> Two years later the Institution was concerned that not enough members had applied for election as Fellows. The transfer fee for elevation was wiped and two new modes of entry approved: by recommendation of the Admissions Committee, and invitation by the Council.<sup>452</sup> The problem had not resolved itself by 1970, when against an expectation of 12–14 per cent, only eight per cent of the membership were Fellows.

Numbers in the Fellow class remained in the 200s for many years, but worrying about it ignored the Institution’s perennial success at encouraging new engineers to join. Despite an aversion to active recruitment – the NZIE “does not believe that it is appropriate for a professional body to mount a recruiting drive among such engineers”<sup>453</sup> – its total membership reached 5,000 in 1975.

## TECHNICIANS AND ASSISTANTS: THE “MIDDLE GROUP”

One membership category for which the Institution eventually rolled out a ragged red carpet was the technician. This, though, is tied up with the convoluted question of engineering education and training, about which much talk and paper had been expended over the years. The Institution had established an Education Committee in 1933 which studied the issue and lobbied, largely unsuccessfully, for detailed changes to the curricula at both secondary and tertiary levels. The Institution contributed to the Consultative Committee on the Education, Training and Supply of Professional Engineers, which reported in 1949.

Continuing its investigation, the NZIE looked to 40 years in the future when engineers could be leaders and in positions of responsibility. With engineering science so complex, it believed chartered institutions “are on their way out” as examining bodies, and started lobbying to become a registering body.<sup>454</sup> The NZIE classified engineers into three distinct groups with its own members in the top tier: professional engineers who should have a university degree. At the bottom were the artisans or tradespeople trained through apprenticeships and night classes. In between was the middle group – the technicians or sub-professionals.<sup>455</sup>

The subject of engineering education was debated with vigour at virtually every NZIE conference. With burgeoning tertiary-level technical education, the Institution felt threatened by rising numbers of qualified technicians – people who were clearly neither artisans nor degree-qualified.<sup>456</sup> But rather than open a door to them, it kept them at arm’s length.

Everyone agreed the country needed thousands of technicians to free the professionals for work of a more specialised nature. So the Institution contributed towards the establishment of a controlling authority for the New Zealand Certificate in Engineering (NZCE) in 1954. The first New Zealand Certificate courses started two years later, and this “middle engineers’ course” was described as an “important milestone”.<sup>457</sup>

In the following six years only 25 certificates were issued for engineering, but soon draughting, chemistry and building construction were added. This led to a new act, the Technicians Certification Act 1958. Its Technicians Certification Authority took over issuing certificates from 1 February 1960. The Institution had a representative on the Authority’s Engineering and Draughting Committee. The NZIE’s interest in this was to make sure the technicians were well enough educated to supervise the artisans, while not impinging on the professionals’ role.<sup>458</sup> Two or three technicians were estimated to be required for each professional.

By 1963, of 2,600 certificate holders, 160 were engineers in civil, mechanical, electrical, telecommunications, refrigeration or production engineering.

While the NZIE supported certification, it had a problem with registering technicians. It opposed such provisions in the Engineers Assistants Bill when it came before Parliament, saying it would cause confusion “in the public mind” with registered engineers.<sup>459</sup>

The Bill was revised to clarify the distinction between professional and technician, and resubmitted as the Engineering Associates Bill, which passed in November 1961. In force from 1 April 1962, it authorised the training courses and established the Engineering Associates Registration Board. It registered technicians aged at least 25 with “general competency” in “basic engineering training” and at least 12 years’ experience (six in positions of responsibility).<sup>460</sup> Those already holding an NZCE or Marine Engineering required only six years’ experience (one in responsibility). The Board’s machinery was the same as for the ERB, and it represented seven technicians’ associations. The NZIE was represented on it through its Chairman, Cyril John Mulley (Bill) Choat (1901–1982).

JB Goldie became the first Registered Engineering Associate to receive the Certificate under the Act from the Minister of Works in 1963.<sup>461</sup>

Once the definition of the technician/engineer was accepted and their system for qualifying laid down, the NZIE reconfigured its category of Associate for them; for those “qualified to collaborate with engineers”.<sup>462</sup> Goldie joined but was only followed by tiny numbers, most preferring one of the numerous other associations that focused on their specialism. They were welcome to join the NZIE’s technical groups.

In 1964, Choat urged the NZIE to encourage the middle group for the benefit of New Zealand industry. For those wishing to qualify as technicians, he said, “there is one underlying theme: work, study, strive and sweat”.<sup>463</sup> Technicians were to be the engineer’s friend, and the NZIE came round to embrace them. It started a series of awards for technicians studying towards the NZCE.<sup>464</sup>

The apparent unanimity at this point did not last long. The Institution tried to represent technicians but the number of specific technician associations grew from 10 in 1968 to 20 in 1976. The Institution was represented on some and watched as technician qualifications then started to rise through diplomas and polytechnic degrees. However, the NZIE would not drop its membership standards to admit them as equals.<sup>465</sup>

Getting into the issue of the NZCE and polytechnic qualifications “opened a can of worms”.<sup>466</sup> The lid has not yet been put back on.

## TECHNICAL GROUPS

The 1960s and ’70s saw a flourishing of technical groups within the NZIE.<sup>467</sup> Usually a specialist section or technical committee formed in response to a specific need – better surfaces for roads, improving the composition of cement, or supporting the rise in aviation.<sup>468</sup> The rules were amended in 1963 to allow such groups.

Rather than members focusing on their regional or occupation similarities, these allowed them to focus on their field of engineering – which itself was fragmenting into ever-more specialised sub-areas. Their overt purpose was to foster the science of engineering, but covertly also to head off the formation of splinter groups. They were to provide a forum

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for members with a common interest and, more significantly, could include non-members too. This was an important departure from previous thinking in the NZIE and dispelled any lingering suggestions of it as an inward-looking, self-protecting body.<sup>469</sup>

The soil mechanics group was the first to form in 1965, but by 1978 it had been joined by engineering groups on building, chemical, earthquake, electro-technical, fuel, geomechanics, mechanical, transport and traffic, water issues, and non-destructive testing.<sup>470</sup>

By the end of the 1970s, seven or eight sectors had come under the NZIE fold to establish joint technical and investigative committees where this interchange of knowledge would take place. The growth reflected a strong desire within the NZIE to workshop the technical issues placed before these groups, to find engineering solutions to specific problems. But it also showed the maturing of its ability to reach out to other bodies and form joint committees that met both organisations' needs under the umbrella of the NZIE. The fuel group set up in 1974 also involved, for example, the management committee of the New Zealand section of the Institute of Fuel.

Desire for technical groups was greater in the newer disciplines. Civil, mechanical and electrical engineers welcomed outsider groups only after much thought.<sup>471</sup>

The NZIE offered a favourable environment and efficient secretarial support for these groups, and a ready means of disseminating their findings. Technical research grants of \$40–50 per annum were instituted in 1974.<sup>472</sup> By 1978, the NZIE employed a part-time Technical Secretary (bringing its office staff up to 12). The NZIE widened the eligibility of its many awards to include papers presented at jointly-organised conferences or by technical groups, even if the paper's author was not a member of the NZIE.

In some cases, the impetus to form groups came from outside: the Chemical Engineering Technical Group was established after a request from the Institution of Chemical Engineers. The Technical Group for Electronics had a slightly bumpier arrival. A small electronics group existed from the late 1960s but talks of a merger between it and a technicians' group, the New Zealand Electronics Institute, promised bigger things. The Electronics Institute was "firmly of the opinion that they should become a technical group" of the NZIE.<sup>473</sup> As a member of the Council of Engineering Associations (incorporated in 1970), the Electronics Institute was required to offer welfare services to its members which, in contrast, the NZIE "had no mandate" to do so.<sup>474</sup> The merger talks stumbled over this issue, but an Electro-Technical Group formed within the NZIE in 1974.

A Transportation and Traffic Engineering Group grew in 1971 from a successful Traffic Management Workshop in Wellington. It would have formed five years earlier had the Chartered Institute of Transport not been developing, which inhibited a technical group. The group formed its own committee of management, issued its own publicity, recruited its own members (80 in its first year) from within and without the NZIE, and plotted to pave the next Institution conference with roading-related papers.<sup>475</sup>

Some of the earlier groups fell apart and were reconstituted afresh. Those on timber and water are examples, being reborn later in the 1970s after tentative starts. Other earlier groups had a limited focus or life-span, such as the Infiltration into Sewers Group which dissolved once its initial focus had been investigated and reported.

Some started as successful independent societies on which the NZIE had an official representative, but then decided to come under the NZIE umbrella. An example is the long-lasting group on soil mechanics, which started as the New Zealand National Society of Soil Mechanics and Foundation Engineering. It became an NZIE technical group in 1965, which added power to its punch and allowed it to host and organise a very successful international conference.<sup>476</sup> In 1972, its name changed to the New Zealand Geomechanics Society while remaining a technical group of the NZIE.<sup>477</sup>

Once formed, the technical groups' output tended to take centre stage. At the 1973 NZIE conference, four technical groups presented papers, and seven in 1976 (including the new Mechanical Engineering Group). By 1977, these well outnumbered the papers coming from the NZIE Publications Committee, and some sessions *only* heard papers from technical groups. Technical groups started to organise their own annual gatherings to coincide with the NZIE conferences, allowing members the choice of focusing tightly or mingling widely. So many were planned that the Council insisted they (and branches) co-ordinate their scheduling to avoid clashes.<sup>478</sup> Some groups published their own proceedings, such as the Transportation and Traffic Group in 1974, leading the Publications Committee to institute "Proceedings of Technical Groups" the following year, for that group as well as the geomechanics, chemical and water groups.<sup>479</sup>

In summarising their rise, George Fraser Bridges (b.1914) said "considerable progress has been made in uniting groups which started as separate organisations, in clarifying objects of the groups, and in generally establishing order in the Institution's technical and scientific field".<sup>480</sup>

But while the technical groups advanced engineering issues, they did not necessarily advance the Institution. Membership of all 10 technical groups in 1975 was 2,760 but of these only 800 were NZIE members. This meant that only 15 per cent of the total NZIE membership (of 5,093) was involved in a technical group. Gradually, more members of technical groups joined the NZIE (the above figure climbing to 18 per cent in 1979). This suggests that technical groups attracted engineers to the wider world of NZIE.<sup>481</sup>

A slightly different group was that on earthquake engineering. The NZIE was represented on the New Zealand Society for Earthquake Engineering (formed in 1968). It also contributed to the New Zealand National Committee for Earthquake Engineering, which was a combine of three learned bodies (NZIE, NZIA and the Royal Society) and the Earthquake and War Damage Commission. It was more a lobbying body for regulatory reform, for instance submitting on a bill giving local government more power to enforce



*Percy Laing.*  
*Past Presidents of the New Zealand Institution of Engineers,*  
*1914–1966 Album, IPENZ Collection.*

earthquake engineering requirements.<sup>482</sup> This followed on from important work undertaken by the Institution since the 1930s in finding a building code that was up to the task of matching the country's seismic conditions.

## THE ENVIRONMENT BECOMES A HOT TOPIC

A by-product of the broadening membership through the technical groups was to expose NZIE members to wider schools of thought. One area in which this became notable was environmental thinking, conservation of energy and resources, and social responsibility.

The boom years of the 1950s saw intense development of water resources, in particular with the conservation voice seldom heard (despite the Royal Society attempts). Electricity demand and consumption rose nearly eight-fold.<sup>483</sup> By 1962, eight new dams had been built and two extended.

One of the newer projects on the Waikato River raised environmental concerns. The Aratiatia rapids were chosen because the river drops naturally through a gorge. A United States engineer proposed diverting the water to a new channel (and turbine) besides the rapids. When work started in 1959, the visual effect on the rapids became evident. Water would permanently cease to flow through the gorge, leaving the rapids dry and undermining their significance to local Māori as well as their tourism value.<sup>484</sup>

Members of the NZIE benefitted from hydro-electric development, the Government's largest item of capital expenditure. It is understandable that in a land often unsettled by violent earth movements, sudden cloud bursts or roaring winds, the engineer's role was seen as taming and containing the natural environment. But water was a resource all too easily corrupted and some members started to give thought to it and the other natural elements being modified. Senior Ministry of Works engineer Percy Laing (1909–1979) devoted his NZIE presidential address to the subject in 1963, under the heading "Engineering and the Environment". The Aratiatia scheme was soon modified to allow daily spills through the rapids.

Ten days after Aratiatia started generating in March 1964, the Government released plans for the Tongariro project in the North Island's Central Plateau. This was to concentrate water from the volcanic catchment through canals for electricity generation in two new stations. The outflow into Lake Taupo would indirectly enhance the Waikato River with its

many stations. This made engineering sense, but raised environmental concerns. In relation to Tongariro, the engineer was called a “philistine with bulldozer”.<sup>485</sup> To be called “smugly conventional” and “indifferent to cultural values” shocked some members.<sup>486</sup>

Environmental concern grew during the South Island’s Lake Manapouri project, which proposed to raise the lake level by 11 metres. Manapouri “turned the tide of public concern into a torrent of criticism”, NZIE member Ian Gunn (b.1935) said.<sup>487</sup> In the end an understanding was reached that power must be generated within the natural rise of lake waters. In the wider context it generated a philosophy that use of natural resources for engineering purposes must not degrade the resource – it must be sustainable.

*The Evening Post* waded into the debate, asking engineers “are you Vandals or Men to Talk To?”.<sup>488</sup> The Tongariro project had shown a “deplorable lack of consideration for the public’s feelings”, leading to “an explosion of public resentment at... departmental indifference to protests”. From this came “at last conscious recognition that it is the prime duty of those who plan big changes to the countryside to keep the public informed and seek their approval and co-operation”.<sup>489</sup>

Even though the Government engineers were taking the hit, the NZIE was taking notes. Prominent member (and Professor of Electrical Engineering at The University of Auckland) Archibald Bogle (1914–2005) defended his profession in the Institution’s mouth-piece, saying that the sins of engineers are light when compared with greater historic villains. When engineers were criticised as “destroyers of beauty”, he retorted that the old farmer did not complain when they brought him power, roads or services. Now New Zealanders “have reached a state of technology sufficiently advanced for aesthetic considerations to be relevant”.<sup>490</sup>

John Rowntree’s (1906–1986) presidential address reminded everyone that an engineer had to work within the economic parameters of a job – that he is “a man who could do for £1 what any fool could do for two”.<sup>491</sup>

## WATER RESOURCES

The Wellington Branch hosted the National Water Symposium in December 1964, predicated on an agreement that New Zealand “is at a vital stage in her planning for water use”.<sup>492</sup> The Minister of Works Percy Allen (1913–1992) noted that no agency had taken on the task of water administration, including conservation, allocation and research into its quality. Yet the NZIE had taken the initiative, provided leadership to other interested sectors and would continue to advocate for legislation to govern water resources. The NZIE Water Resources Committee under Archibald Parkes Campbell (1912–1991) kept up the momentum on the subject. After the Water and Soil Conservation Act 1967 was passed, the Institution claimed its efforts “unquestionably influenced national policy”.<sup>493</sup>

Before the huge Maui gas find, New Zealand’s known fossil fuel stocks were relatively small. As Philip William Blakeley (1915–1994) told the Institution in 1967, New Zealand’s

“most plentiful natural energy source is water for hydro-electric power, but exhaustion of the North Island potential is within sight and the more abundant sources in the South Island are remote from the area of greatest demand”.<sup>494</sup>

The 1966 annual conference made a call to work on conservation of energy. A committee was formed to investigate energy loss but was soon renamed the Energy Conservation Committee with a broader mandate. Despite being Chief Engineer for the New Zealand Electricity Department, Blakeley took on the role as convenor. Building on the earlier work of “enlightened enthusiasts”, its first project was to prevent space-heating loss and so focused on research into building insulation.<sup>495</sup> It became a standing committee in 1975, as the Energy Committee (with representatives from the NZIE, technical groups, government departments and industry).<sup>496</sup>

Editorials in *New Zealand Engineering* started to talk in the mid-1960s of New Zealand’s “limited energy resources”. Indeed, when the word “energy” supplanted previous terms such as “electricity” and “power”, it was most often associated with a finite rather than unlimited supply. Even though water is a renewable resource, the cost of each new dam made hydro-electricity very expensive. Generation was not the only call on the resource; irrigation came a close second.<sup>497</sup>

Even with legislation in place on water, issues remained. The Auckland Branch hosted a New Zealand water conference in May 1970 with the Royal Society. The NZIE claimed it “earned the right to conduct that kind of open forum wherein politicians, administrators, engineers, scientists, and those key people called water-users, who carry on the real action, can meet together to discuss the best directions and priorities for future efforts”.<sup>498</sup> This conference built on that from 1964, moving the thinking on water from first-come, first-served, through planning for single-purpose use, to “organisation for multiple-use and proper co-ordination for the benefit of the whole community”.<sup>499</sup>

Throughout this period, the NZIE had separate committees on water resources and water supply. The emphasis given to water saw the representation widen on the resources committee and in 1972 it became the Technical Group on Water. Like other technical groups, it formed its own management committee and started sub-groups working with NZIE branches.<sup>500</sup>

## CONFRONTING SOCIAL RESPONSIBILITY

In 1967, the Auckland Branch held a symposium called “The New Zealand Countryside in 1980”. It “nervously pushed out its ‘Countryside’ boat, wondering if there was enough water to float it, and temporarily won for engineers a place of leadership”. The *New Zealand Engineering* editorial then quoted Julius Caesar: “‘There is a tide in the affairs of men, which, taken at the flood, leads on to fortune. The environmental tide is flooding. Our choice is to take the tide, meet the new technological challenge and expand our responsibilities, or be submerged by it.’”<sup>501</sup>

When a National Development Conference was planned, the NZIE criticised the lack of an engineering or scientific perspective on its organising committee. The NZIE made eight submissions to it, all of which were adopted in whole or in part.

This lobbying and the success of Auckland's symposium led the NZIE to be invited to run an environment conference with the Physical Environment Committee of the National Development Conference. It was held in Wellington in May 1970. Pollution was one of the five sub-groups (the others being land, urban development, urban expansion and organisation). This was a positive outcome for the Institution.<sup>502</sup>

To acknowledge that "the profession itself is under attack... over environmental matters" the NZIE created a biennial NZIE Environmental Award in 1971.<sup>503</sup> Judged by the recently-established Environmental Council (and later by a hand-picked panel), it was to be awarded to "a project, predominantly engineering in nature, which... best exemplified care for and consideration of environmental values."<sup>504</sup> Rather than recognising the engineer, it would go to the owners or commissioners of the project, in the form of a bronze plaque (designed by Don Hatcher) to be displayed at the site and a certificate for their office.<sup>505</sup>

The first seven nominees, including a motorway, were newsworthy.<sup>506</sup> The inaugural winner was announced at the 1972 NZIE Conference in Christchurch – the Ministry of Works for the design of the Wellington urban motorway project between Ngauranga and Hill Street. Ironically, the next stage of this project, cutting through the Bolton Street cemetery, became a *cause celebre* for opponents of heartless development.

The NZIE's own environmental contribution besides this award was to urge conservation of resources. An editorial in *New Zealand Engineering* said the emphasis now is to design developments that carefully husband finite resources.<sup>507</sup> All NZIE branches were encouraged to establish environmental committees, and most did.<sup>508</sup>

Over this period, technical papers, editorials and news stories on environmental aspects surged. Of the papers given over the first 50 years of the Institution, up to 1964, none centrally addressed the issue of scarcity of resources, and only two talked of their degradation.<sup>509</sup> In the period 1964–1980, there were 52 papers and news items on the subject of energy and 55 on the environment (with 176 and 259 respectively between 1980–2000), as well as new separate entries for fuels, mining, natural gas, nuclear power and resource management.<sup>510</sup>

By the mid-1970s, the NZIE had not only seized the mantle on environmentalism, but was able to poke fun at others whose attitudes lagged. The annual conference in Auckland in February 1975 witnessed a satire set in the fictional "Waimakato". "A large and distinguished cast dramatised the activities of the Waimakato County Council in considering a proposal to develop an opencast coalfield, and in the process cocked a satirical eye at the workings of local councils in matters affecting the environment." It was "one of the highlights of the conference."<sup>511</sup>

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However, by the time the NZIE had become IPENZ in the early 1980s, only a minority of members were prepared to lift their heads above the parapet and advocate radical change. They formed a ginger group, keen to shake out of its lethargy what they perceived as “a rather stuffy institution” (particularly on environmental issues). “Eighty per cent of IPENZ are career-oriented conservative engineers who don’t want to rock the boat,” one of the group, Gerry Lynn Te Kapa Coates (b.1941), says. “Twenty per cent are more liberal minded.”<sup>512</sup> In the latter group were the two per cent who he says looked beyond engineering and at world trends, and felt they had to live up to a social responsibility. Encouraged by liberal Presidents and Board members such as David Thom (b.1924), Alexander Stirrat (1924–2000) and Murray Sweetman (1929–1993), this group determined to become activists.

Their concerns, boosted by engineers’ involvement in weapons manufacture, runaway technology (like robotics and computers for which no end was visible) and other perceived engineered evils, led to the formation of Engineers for Social Responsibility (ESocR) in 1983. The super-destructibility of nuclear and chemical weapons was seen as anathema to the engineers’ creed of benefitting mankind. Those behind ESocR believed that “engineering activities have the incontrovertible potential to cause profound change”, which called for a responsible and moral approach.<sup>513</sup> The ESocR went on to run conferences (coinciding with IPENZ annual gatherings) in which speakers talked “about the plight of a world overrun by technology, in which engineers are largely silent about the implications”.<sup>514</sup>

Some conservative members showed “open opposition” to ESocR.<sup>515</sup> A former President, Sir John Ingram (b.1924), is said to have initially called them “the lunatic fringe”. It “didn’t take long to change people’s minds,”<sup>516</sup> Coates adds, and even Ingram later attended their meetings and supported the introduction of Environmental Impact Reports. The breakaway led to debate within IPENZ about whether such issues should be considered at all, and what relationship the Institution should have with ESocR. Two years later, IPENZ President Stirrat made no bones of it: “Whether we like it or not, ESocR is rapidly becoming our social conscience and as such must inevitably be seen as an important part of our corporate being...”<sup>517</sup> A symbiotic relationship did develop, though the ESocR declined to become a technical group of IPENZ, preferring its independence.

The Institution never led the conservation movement, but eventually came to echo popular concern over the environmental effects of works in which engineers were involved. The Institution as a forum also allowed members to state views which might not be welcomed in their workplace.

## NUCLEAR THINKING

An area on which developmental and environmental engineers disagreed was nuclear power. Early on, *New Zealand Engineering* recognised it as an “unparalleled force for good or evil”

with a cover photograph of a mushroom cloud. The potential to go either way called for constant vigilance by engineers and politicians.<sup>518</sup>

By the early 1950s, atomic power for electrical generation was being discussed.<sup>519</sup> Since the War, the Government had searched for uranium in New Zealand and in 1955 set up a company, Geothermal Developments Limited, to investigate a nuclear power station or heavy water plant on the Waikato River.

This new science highlighted the fact that New Zealand was not only short of engineers but far from the lead in this field, despite Sir Ernest Rutherford (1871–1937) pioneering research and New Zealand scientists' significant involvement in wartime A-bomb development. NZIE President Richard Maunder advocated for nuclear power generation in New Zealand to ease the load on hydro-electric stations and coal reserves.<sup>520</sup>

The Wellington Branch heard in 1957 that nuclear generation would place “considerably less strain on the economic resources of the country” than conventional means.<sup>521</sup> Ten years later, the Branch heard EB MacKenzie, a member and General Manager of the New Zealand Electricity Department, outline the need for nuclear power in New Zealand. In 1968, the first New Zealand nuclear power station (the first of four) was put into the planning process for the forthcoming decade.<sup>522</sup>

Maui gas also arrived in 1970 which, with growing public aversion to anything nuclear, allowed the nuclear stations to be removed from plans.<sup>523</sup> A Royal Commission on Nuclear Power Generation was established to look at the “likely consequences of nuclear-generated power”.<sup>524</sup> The NZIE established a working group chaired by Kenneth Christie (1918–2000) to make a submission.

The submission said there are many NZIE members “concerned at the prospect of... nuclear power... just as there are many who believe that its advent is inevitable and... preferable”.<sup>525</sup> Of NZIE members, 47.6 per cent supported coal-generation while 41 per cent wanted to go nuclear. This prevented the NZIE speaking with one voice; agreement might never happen if it “avoids taking hold of nettles”.<sup>526</sup> Instead, the submission confined itself to engineering comments on planning and development, including that New Zealand's unstable geology might make the storage of waste tricky. The Institution later made a similar submission on nuclear propulsion in the wake of visits to New Zealand ports by reactor-driven warships.<sup>527</sup>

While unable to form domestic policy, the Institution ventured opinions internationally. Thom had long been New Zealand's representative to the World Federation of Engineering Organisations (WFEO), and by the 1990s IPENZ claimed it was “taking a leading role internationally in environment” matters. Together with IEAust, IPENZ put up a motion condemning French nuclear testing in the Pacific at the 1995 WFEO meeting. The motion was lost but “a strong point was made”.<sup>528</sup>

Nuclear issues continue to be discussed.<sup>529</sup>

## ETHICS AND A CODE OF PRACTICE

At first, the Institution regulated the behaviour of members through rules. Rule 19 stated that “Each member shall order his conduct so as to uphold the dignity, standing and reputation of the profession”.<sup>530</sup>

A Code of Practice for Consulting Engineers was drafted in the 1950s but not published.<sup>531</sup> Ethics and consulting engineers were considered “strange bedfellows” but they go hand-in-hand because it was felt, as fee-charging free-market agents, consulting engineers are more likely to stray into the minefield of unethical behaviour.<sup>532</sup>

A Code of Ethics for all members was first published by the NZIE in 1964. It was seen as a way of internally regulating the behaviour or etiquette of members (both towards each other and to clients and staff) and by so doing obviating the need for external scrutiny.<sup>533</sup>

Initially, the Institution’s Council, and then the Executive Committee for Professional Practice, investigated cases involving alleged professional misconduct. They always found it “a very delicate subject calling for considerable tact and understanding”.<sup>534</sup> In 1964/1965 an Ethics Committee was established to handle this work, working under terms of reference agreed by the NZIE/NZIA Joint Standing Committee.

The 1964 Code was rules-based; nine articles stating what members shall and shall not do. It has been described as “self-protective” and inward-looking.<sup>535</sup> It clung to gender-specific language and made no reference to public interest. Apart from investigating breaches, the standing Ethics Committee had little to do.

The philosophic relationship between professionals and society was later workshopped in talks run by IPENZ. New Zealand theologian Lloyd Geering (b.1918) said there is an implicit ethical contract for professionals such as engineers, priests or lawyers. When they use their position for their own rather than society’s benefit, this contract is betrayed and their reputation suffers.

Later, Geering, Dr John Hinchcliffe and David Russell discussed what an engineer’s code of ethics should be. They agreed on statements of high-level principle which would help people work out the ethical pathway when faced with a dilemma. A profession was defined as people working in their specialism under the discipline of an agreed ethic (a standard of conduct or moral judgement).

Illustrating this is a line drawn in the sand, representing actions beyond which a professional must not go. A lawyer or tax accountant could get their toenail almost touching that line and would still be on the ethical side of the law. But an engineer or doctor must remain far from the line to allow as wide a margin of safety as possible.

By the 1990s, the Code was seen as out-of-date and IPENZ decided to revise it based on values. The Ethics Committee was purged. Chair Neville Beach (1931–2010) was kept on and Gerry Coates (who had provocatively talked of “Engineers as Moral Heroes”<sup>536</sup>) added along with others. “All of a sudden we had some traction,” Coates said.<sup>537</sup> Based on five



*Portrait of Edward Dobson 1816–1908 [circa 1866].*  
 Ref: PA2-2445. Alexander Turnbull Library, Wellington, New Zealand.  
 URL: <http://natlib.govt.nz/records/22675578>.



*Arthur Dobson.*  
 Past Presidents of the New Zealand Institution of Engineers, 1914-1966  
 Album, IPENZ Collection.

key aspirational values, the responsibility was changed to public interest. Members were to “actively work towards the wellbeing of society” and “minimise adverse environmental impacts”.<sup>538</sup> It was published in 1995 with guidelines.<sup>539</sup>

Ethics are very important: most complaints IPENZ receives are about unethical behaviour. IPENZ claims to be the first engineering body in the world that changed to an aspirational-based code, which recognises obligations to society and the environment. Over the decades the emphasis on ethics has changed from protecting the reputation of the Institution to protecting everything outside it. Members are now asked – almost incidentally – “to play their part in upholding the reputation of the Institution...”. This reputation has been put under the scrutiny following the Canterbury earthquakes of 2010/2011.<sup>540</sup>

## **REACHING OUT WITH THE DOBSON LECTURES**

Getting youngsters into engineering was the motivation for the Dobson Lecture series, which started in 1961. Traditional vocational guidance had not attracted sufficient numbers, so in 1960 Bill Choat, a Council member, suggested a lecture series. A committee formed to find sponsors and liaise with secondary schools to deliver an audience. The lectures were given in the main centres by up to four leading engineers. The topics were designed to fire up youthful

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imaginations – “Power for the Nation”, “This World of Wheels” and “The Jet Age”. Assistant Commissioner of Works Percy Laing’s lecture claimed “engineers do move mountains”.<sup>541</sup>

Attendance soon climbed to nearly 2,000 and a brochure on engineering careers was handed out. From the second year, lecturers went to smaller cities like Hamilton, Palmerston North and Dunedin and thereafter visited a mix of towns.<sup>542</sup>

The series was named after a pioneering engineering family. Edward Dobson was a former provincial engineer who opened the Canterbury plains and helped establish Canterbury’s School of Engineering. His son, Sir Arthur Dudley Dobson (1841–1934), was NZSCE President in 1924/1925 and, according to the Mayor of Christchurch James Arthur Flesher (1865–1930), a household name in engineering circles – “Anno Dominie Dobson”.<sup>543</sup>

A novelty in 1971 was to put up lecturers of comparative youth themselves: Neville Jordan (b.1943) being 28 and Robert Aspden (b.1938) who was 33.<sup>544</sup>

The last Dobson lecture specifically for school pupils was toured in 1972. In 1974, Sir Dove-Myer Robinson (1901–1989) spoke on engineers’ responsibility to the public.<sup>545</sup> Robinson’s delivery marked a change in direction. The lectures henceforth were aimed at a wider audience, and they “enhanced the standing of the Institution generally”.<sup>546</sup>

The Committee started working on other ways to turn young minds to things engineering. The Committee evolved into a school liaison committee, changing its name formally in 1985.<sup>547</sup>

In 1978, it produced a new careers brochure entitled “The World of the Professional Engineer”.<sup>548</sup> The 1979 lecture was videoed for repeated viewing and in the early 1980s the Committee provided funding for The University of Auckland to make video programmes on engineering careers.<sup>549</sup>

The last Dobson lecture was given in 1985, after which the brand languished. It was picked up again in 2005, for the Dobson Transportation Award – one of the Supreme Technical Awards for Engineering Achievers.

## PREMISES: AURORA TERRACE AND MOLESWORTH STREET

In 1952, the NZIE moved out of its rented offices at 8-12 The Terrace near the corner of Bowen Street. Rents had risen and the Institution’s needs expanded. Instead, the NZIE purchased an old three-storey timber building close by on Aurora Terrace. It seemed cheap at the time but, being in the gully, was rotting in parts and difficult to maintain.

Ten years later, Wellington City compulsorily purchased the land for a carpark building, and the NZIE had to move out. Mayfair Properties Limited was a partner in the project and it temporarily accommodated the Institution at Mayfair Chambers, 48 The Terrace, from December 1963. Meanwhile, the ad-hoc Premises Sub-committee was promoted to a Standing Building Committee, under the Administration Committee, to hunt for a new permanent home.<sup>550</sup>

It soon found a location desirable for its proximity to Parliament. A new building was going up at 101 Molesworth Street (over the road and two blocks up from the original Molesworth Street site) in which four floors and six carparks were purchased. Whereas Aurora Terrace had cost £10,000 in 1952, these premises cost £94,000. However, this building promised far greater income from rents which would partly offset the mortgage costs.<sup>551</sup> This appealed to a Council which always aimed for “a more favourable relationship between income and expenditure”.<sup>552</sup> The NZIE moved into the third and fourth floors on 23 July 1966, which the Governor-General, Brigadier Sir Bernard Fergusson, officially opened in October.<sup>553</sup> Whereas the previous five decades had seen six different addresses, the Institution was to find a sense of permanence in Molesworth Street.



*Molesworth House building, Wellington [circa March 1968]. Winder, Duncan, 1919-1970: Architectural photographs. Ref: DW-3207-F. Alexander Turnbull Library, Wellington, New Zealand. URL: <http://natlib.govt.nz/records/23170550>.*

Midway through this process, the executive leader changed. After 20 years in the job, 60-year-old Douglas Bedingfield retired in 1964. The Wellington Branch gave him a television.<sup>554</sup> Curiously, details of the paid staff also rarely appeared in the annual reports and the Secretary and Deputy Secretary were absent from meetings whenever their roles were discussed. Bedingfield was replaced by retired RNZAF Air Commodore, Reginald Stevens (1905–1984), who stayed in the role until 1976.

## **BENEVOLENT FUND**

The Benevolent Fund was used to help the NZIE buy the 101 Molesworth Street premises.<sup>555</sup>

However, the fund's income was pitiful. In 1964, it manufactured and sold 297 ties. In 1968, 307 members of the Benevolent Association were each contributing an average of 18 cents. The Association suggested all Society members be levied. President Bruce William Spooner (1911–1982) suggested 50 cents in 1968 and three years later, Ronald AJ Smith (1909–1992) suggested rounding the Society subscription up to the next full dollar. Neither idea was adopted.<sup>556</sup>

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Grants of \$100 were able to be issued to widows without reference to the whole Committee. Ex-members became eligible under new rules in 1966. “[R]elief had been granted in not more than five cases in the last 10 years but sometimes quite substantial sums had been advanced, and in quite a number of cases those sums had been repaid”.<sup>557</sup>

In the 1970s, the future of the fund was questioned. So few payments were made from it that in 1975 Richard Goulden Brickell (1908–1994) suggested the Administration Committee handle them from general funds. “Even the name was rather Edwardian,” he added.<sup>558</sup>

Management of the Association lost its edge, with many returns not reaching the Registrar of Incorporated Societies (the last on file is 1974). The Association decided to wind itself up in 1976.<sup>559</sup> Remaining funds were transferred to the NZIE.

In the same month, July 1976, a new Benevolent Fund of the NZIE was formed to assist former and current members.<sup>560</sup>

## ENDNOTES

- 421 Technical Committees in 1960 included: Infiltration into Sewers, Pile Testing, Prestressed Concrete, Road Structures, Code of Practice of Measurement of Civil Engineering Quantities, Glued Laminated Timber Construction, Review of the Boilers Lifts and Cranes Act and Boiler Code, and Corrosion of Water Fittings.
- 422 NZIE was represented on Standards committees covering engineering disciplines (civil, mechanical, electrical), approaches to construction (timber, masonry, concrete), techniques or aspects of construction (modular, welding, scaffolding, loadings, foundations) and materials (bituminous, hardwoods, fibre cement, ceramics, mild steel, water). NZIE engineers even sat on NZSI committees on bylaws, trade headings, drawing practice and mild-steel dustbins. AR 1960, 4.
- 423 AR 1963, 2. AR 1965, 7.
- 424 AR 1965, 8.
- 425 AR 1965, 8.
- 426 *Report of the Council*, 1961, 20; 1964, 28; 1965, 30.
- 427 AR 1960, 7.
- 428 Rowntree in *Procs NZIE 1946*, 93.
- 429 RD Pope, ‘Mentoring Aiding the Birth of a Branch,’ undated manuscript.
- 430 AR 1960, 9.
- 431 Hugh Elder, *NZE 38:10* (November 1983), 11.
- 432 AR 1964, 9.
- 433 GF Bridges, ‘Technical Groups of the N.Z.I.E.’; *NZE 30:6* (June 1975), 169.
- 434 AR 1967, 21.
- 435 AR 1962, 25; 1963, 25.
- 436 AR 1968, 15, (quote) 22. The Liaison Committee first met in September 1967.
- 437 Report of Council 1970, 24.
- 438 Report of Council 1974, 26. A New Zealand section of the Institution of Production Engineers formed in 1962, under JE Lissamen. *Evening Post*, 28 November 1962.
- 439 Bridges, ‘Technical Groups of the N.Z.I.E.’; 169. The Industries Division folded in the 1980s.
- 440 Quote from *Evening Post*, 27 September 1965. *Evening Post*, 30 September 1965, 2 October 1965, 10 October 1965.
- 441 *Evening Post*, 22 June 1970, 8 February 1971.
- 442 *Evening Post*, 15 February 1969. Excell was ex-Director of Naval Training and Director of Gunnery, Royal New Zealand Navy.
- 443 Report of Council, 1970, 20-21.
- 444 *NZE 26:12* (December 1971), 404.
- 445 Steve Gentry interview with author, 21 June 2012.
- 446 *Evening Post*, 18 July 1964. AR 1967, 15. Robert Muldoon confirmed that government policy was to hire New Zealand expertise for public works whenever possible, *Evening Post*, 29 June 1970.
- 447 For example, the Geraldine County Engineer, KHP Beck, made this claim over North Canterbury roading work which Harold G Roys of NZIE’s Consulting Engineers Division refuted. *Evening Post*, 15 June 1966.
- 448 AR 1962, 9. AR 1963, 8. *TPE 220* (May 1963), 3.
- 449 Quote from AR 1963, 9.
- 450 AR 1964, 9. Approved at a SGM on 12 October 1964. The first Companion Member was noted in AR 1968, 24. Definition as in Rules, 5.4, *Professional Information for Members of the IPENZ*, 1986, 14. AR 1980, 61.

- 451 Neil G Hansen and J Noel Hall, *The County Engineers of New Zealand, 1876-1989* (Tauranga: Association of Local Government Engineers of New Zealand, 1993), 10.
- 452 AR 1965, 8.
- 453 AR 1970, 4.
- 454 *Evening Post*, 7 October 1952.
- 455 Minutes, 22 September 1950. Minute Book 1950-51.
- 456 AR 1961, 24. NZE 15:11 (November 1960), 387.
- 457 Quote from Institution of Automotive and Aeronautical Engineers AR, *Evening Post*, 22 March 1956.
- 458 NZE 15:11 (November 1960), 387. CJM Choat 'Engineering Associates Registration,' NZE 18:6 (June 1963), 198.
- 459 AR 1961, 24.
- 460 Quotes from 'Engineering Associates Act, 1961 No 70,' New Zealand Legislation, URL: <http://www.legislation.govt.nz/act/public/1961/0070/12.0/DLM336844.html> (accessed 12 August 2013). Choat 'Engineering Associates Registration,' 198.
- 461 NZE 18:4 (April 1963).
- 462 SR, 5 April 1956, Rule 7. Heating and ventilation engineers, radio and electronics engineers, and some structural engineers, would also argue that the Institution in its earlier years and the ERB were slow to recognise them. AR 1964, 33. NZE 6:8 (August 1951), 318. NZE 19:10 (October 1964), 406.
- 463 Choat 'Engineering Associates Registration,' 200.
- 464 AR 1965, 13. The first Year-III Award, in 1965, was issued to MH Mannion at Auckland Technical Institute, and Year-V Award to GFL Coker at Manawatu.
- 465 For a discussion of NZIE and technicians see AR 1967, 6. AR 1970, 20; 1971, 7; 1975, 7; 1976, 5. 'Quo Vadis,' NZE 22:5 (May 1967), 177. NZE 39:12 (December 1984), 62.
- 466 Robert Wilkinson interview with author, 15 May 2012.
- 467 JC North, 'A Decade of Expansion – a Need for Reappraisal,' Presidential Address in NZE 25:3 (March 1970), 61.
- 468 EC Minutes, 28 March 1951.
- 469 As late as 1956 NZIE had been called a "Protective society," by Dunedin's *Evening Star*. Cited in EC Minutes, 16 April 1956.
- 470 Bridges, 'Technical Groups of the N.Z.I.E.' 168.
- 471 Report of Council, 1970, 12; 1972, 5, 16. Wilkinson interview.
- 472 Report of Council, 1974, 12.
- 473 Quote from Report of Council, 1970, 12; 1971, 11.
- 474 Report of Council, 1971, 11.
- 475 Report of Council, 1972, 17. Malcolm Douglass, *A Wheel on Each Corner: The History of the IPENZ Transportation Group 1956-2000* (Wellington: IPENZ, 2007), 7.
- 476 *Evening Post*, 13 February 1967.
- 477 Report of Council, 1972, 13.
- 478 AR 1969, 16.
- 479 Report of Council, 1975, 9. Douglass, *A Wheel on Each Corner*.
- 480 Bridges, 'Technical Groups of the N.Z.I.E.,' 169.
- 481 Ibid. Similar figures for 1979 were 978 members and around 1481 non-members. Report of Council, 1979, 7.
- 482 AR 1968, 13.
- 483 Rennie, *Power to the People*, 149.
- 484 Ibid., 148. Rosslyn J Noonan, *By Design: A brief history of the Public Works Department, Ministry of Works, 1870-1970* (Wellington: Government Printer, 1975), 248. Ian Gunn, *Beacons at the End of the World*, television series, episode 6, 1986. Waitangi Tribunal, '2.2 Take Whenua Kite Hou: Te Arawa,' *The Pouakani Report* (Wellington: Brooker and Friend, 1993), 2. The name Aratiatia refers to an explorer Tia climbing down a zig-zag of steps (ara) to inspect them.
- 485 Quote from artist Peter MacIntyre in *Evening Post*, 24 June 1964, 32; Gunn, *Beacons at the End of the World*. Noonan, *By Design*, 241. Ngati Turangitukua also used this phrase to describe the Ministry of Works' dealings with the iwi over the Tongariro scheme, in particular, the potency of its Public Works Act. Waitangi Tribunal, 'Chapter 12,' *Turangi Township Report* (Wellington: GP Publications, 1995), 4.
- 486 Philistine definition in *Collins Concise English Dictionary*, 1978.
- 487 Gunn, *Beacons at the End of the World*.
- 488 *Evening Post*, 10 February 1965.
- 489 Ibid.
- 490 *Evening Post*, 14 September 1965.
- 491 *Evening Post*, 15 February 1966.
- 492 AP Campbell, 'A Vital Future for Water Resources,' NZE 20:3 (March 1965), 81.
- 493 'Open Forum on Water,' NZE 25:3 (March 1970) 59.
- 494 PW Blakeley, 'Energy Conservation in New Zealand,' NZE 22:10 (October 1967), 426. The imbalance of generating capacity was eventually fixed by the Cook Strait cable, bringing electricity from South Island to the North.
- 495 AR 1966, 12; 1967, 12. PW Blakeley, 'Institution Action on Conservation of Energy Resources,' NZE 22:9 (September 1967), 355.
- 496 AR 1975, 9.
- 497 'Waste Not, Want Not,' NZE 21:7 (July 1966), 273. Blakeley, 'Institution Action on Conservation of Energy Resources,' 355. This point was reinforced in NZIE's submission to the Task Force on Social and Economic Planning in 1976, 'Part 5. Natural Resources. Point 1'. 16 July 1976.
- 498 'Open Forum on Water,' 59.

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- 499 Ibid.
- 500 AR 1974, 20.
- 501 'Σe=E', NZE 25:4 (April 1970), 87.
- 502 AR 1968, 6; 1969, 6.
- 503 AR 1973, 24.
- 504 AR 1971, 8.
- 505 *Evening Post*, 12 June 1971.
- 506 *Evening Post*, 25 October 1971.
- 507 'Conserving resources: Today's Design Priority', NZE 30:10 (October 1975), 283.
- 508 AR 1972, 5, 11.
- 509 'NZIE 50 Year Index of Publications,' unpublished manuscript, 1964.
- 510 'New Zealand Engineering Index, Volumes 19-35:2 [1964-1980]'; 'New Zealand Engineering Index, Volumes 35:3-54:9 [1980-2000]'; IPENZ, URL: <http://www.ipenz.org.nz/ipenz/Publications/indexes/> (accessed 13 August 2013).
- 511 'NZ. Institution of Engineers annual conference,' NZE 30:4 (April 1975), 117. Characters such as Ted Land (the council and hearing chairman), Bob Driver (developer) and his offsider T Putter, were played by JB McGlashin, CP Hutchinson, William H Blackwell, John B Lello and BM Glaister. This was not the first such satire put on for conference.
- 512 Gerry Coates interview with author, 30 May 2012.
- 513 Alan L Titchener, 'No Place to Hide' ESR Conference, Hastings (12 February 1984), 7.
- 514 'Our Social Conscience,' IPENZ Conference '85 News, (Wellington: IPENZ, 1985).
- 515 Coates interview.
- 516 Ibid.
- 517 'Our Social Conscience.'
- 518 'E=mc<sup>2</sup>', NZE 1:7 (October 1946). This editorial supported the McMahon Bill in the United States which proposed rigorous civilian controls, passed as the Atomic Energy Act of 1946.
- 519 WB Morton, 'Some Notes on Atomic Power,' NZE 5:12 (December 1950), 1094; 6:2 (February 1951), 48; 'Nuclear Energy,' 20:8 (August 1965), 311; 13:4 (April 1959), 116.
- 520 'Nuclear Energy,' NZE 11:9 (September 1956), 281.
- 521 DSIR physicist, Tony McWilliams, at a Wellington Branch meeting. Cited in Rebecca Priestley, *Mad on Radium, New Zealand in the Atomic Age* (Auckland: Auckland University Press, 2012), 191.
- 522 *Evening Post*, 8 July 1967.
- 523 Priestley, *Mad on Radium*, 199.
- 524 AR 1976, 5; 1977, 6.
- 525 'NZIE Submission to the Royal Commission on Nuclear Power Generation in New Zealand,' 31 January 1977, 1.2; NZE 32:7 (July 1977), 165.
- 526 'A Single Voice,' NZE 32:7 (July 1977), 149. Of 500 members approached, 7.4 per cent advocated oil and four per cent did not respond. Dr Peter Phillips, Massey University study.
- 527 'Submission to the Special Committee on Nuclear Propulsion,' 31 March 1992, IPENZ.
- 528 AR 1995, 5.
- 529 See 'Clean and Green – or Nuclear. Ask an Engineer,' *e.nz* 6:5 (September/October 2005), 18.
- 530 AR 1963, 10. In later years it was Rule 18.
- 531 NZE 20:1 (January 1965), 1. EC Minutes, 26 April 1951, 5. NZE 26:12 (December 1971).
- 532 Quote from AH Corbett *The Institution of Engineers, Australia: A History of the First Fifty Years, 1919-1969* (Sydney: Institution of Engineers Australia in association with Angus and Robertson, 1973), 159, 166. The Institution of Engineers Australia (IEA) formed a Code of Ethics Standing Committee and scale of charges, and borrowed their draft code from the American Society of Civil Engineers. The New Zealand Code of Ethics for Consulting Engineers was published in 1971.
- 533 'Articles of Professional Conduct,' NZE 19:11 (November 1964), 409.
- 534 AR 1965, 14.
- 535 Gerry Coates, 'Developing a Values-based Code of Engineering Ethics,' *IPENZ Transactions* 27:1 (July 2000), 1.
- 536 Gerry Coates, 'Engineers as Moral Heroes - Are Our Ethics Good Enough?' NZE 41:8 (September 1986), 13.
- 537 Coates interview.
- 538 'IPENZ Code of Ethics [1996-2005],' IPENZ, URL: [http://www.ipenz.org.nz/ipenz/Who\\_we\\_are/ethics\\_pre\\_2005.cfm](http://www.ipenz.org.nz/ipenz/Who_we_are/ethics_pre_2005.cfm) (accessed 13 August 2013).
- 539 The five values are: protection of life and safeguarding people; professionalism, integrity and competence; commitment to community wellbeing; sustainable management and care for the environment; and sustaining engineering knowledge. It was updated in 2005 by adding minimum standards required under the Chartered Professional Engineers rules.
- 540 Quote from 'Engineers and Ethical Obligations,' IPENZ Practice Note (February 2007), 4. Andrew Cleland, 'Code of Ethics' unpublished typescript, 28 March 2012. Charles Willmot (IPENZ Manager Investigations and Discipline) interview with author, 25 October 2012.
- 541 *Evening Post*, 4 August 1962.
- 542 AR 1961, 8, 17. *Evening Post*, 13 June 1961. NZE 16:7 (July 1961). Newnham, *Learning Service Achievement*, 255. 20,000 new careers brochures, 'The World of the Professional Engineer,' were printed in 1978. AR 1978, 6.
- 543 *Procs NZSCE 1924-25* 11, 23. Neutze, *Design for a Century*, 15. 'Engineering heritage of Dobson family,' NZE 35:11 (December 1980), 49.
- 544 AR 1971, 19.
- 545 AR 1974, 10.

- 546 AR 1965, 7.  
547 AR 1985, 61. *NZE* 40:12 (December 1985), 52.  
548 AR 1978, 6.  
549 AR 1979, 6; 1982, 48.  
550 AR 1962, 9; 1963, 8.  
551 AR 1964, 8. £46,000 was borrowed and £44,910 raised through debentures sold to members. The Aurora Terrace building had a small basement flat which earned little.  
552 'Report of Council,' *Procs NZIE 1951* 38, vi.  
553 AR 1965, 6; 1966, 6.  
554 *Evening Post*, 7 October 1964.  
555 'Annual Report,' *NZE* 21:4 (April 1966), 175.  
556 Benevolent Association annual reports for years ending 30 September 1969 and 1971 respectively in ANZ file, Registrar of Companies file 1920/9.  
557 'Annual Report' (April 1966), 175.  
558 'NZIE news section,' *NZE Supplement* 30:4 (April 1975), 3.  
559 NZIE to Asst Reg Inc Socs, 20 February 1978, ANZ, Registrar of Companies file 1920/9. The wind-up decision was taken at the annual meeting in February 1976, confirmed by a Special General Meeting on 22 July 1976.  
560 *NZE* 31:10 (October 1976), 175.



# 1980s

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## NAME CHANGE TO IPENZ

A change of name mooted after the merger with PEANZ in 1959 was defeated in a referendum.<sup>561</sup> Retaining the title “Professional” was recommended as a hallmark of an engineer’s quality, one no longer conveyed by the term “Registered”. The debate meandered on for two decades until the early 1980s – twice as long as that in the 1930s.

The inclusion of the word “Professional” in the Institution’s name was advocated for because it conveyed a sense of prestige and respectability.<sup>562</sup> Despite this, to some of the older school members, change was contentious. Ian Black said “the word professional had no particular *mana* in today’s society”. He believed inclusion of the word was “a vulgar and pretentious exercise” which “would engender resentment in those termed the sub-professional engineering groups”. Conversely, Charles Martin (1918–1990) said the distinction was exactly what was required, helping the public decipher professionals from unionised “fitters”, and “increase[ing] the visibility of our group among politicians and the non-technical opinion leaders of our society”.<sup>563</sup>

The purpose of including “Professional” in the new name for the Institution was to clearly identify the professional engineer in the public mind, according to President Raymond Meyer (b.1931).<sup>564</sup> He defined professionals as degree-qualified and experienced in applying a scientific outlook to problems, whilst working ethically in the public interest.

With enthusiasm from Auckland, the 1981 conference passed a motion for change and the matter was put to members. Most people were now “strongly in favour” of the new name “The Institution of Professional Engineers New Zealand Incorporated”.<sup>565</sup> The change was carried, not unanimously, on a show of around 100 hands in the Ngaio Marsh Theatre,

Christchurch, on 11 February 1982. Another SGM in May approved the new post-nominals for the various levels of IPENZ membership: Hon FIPENZ, FIPENZ, MIPENZ, Comp IPENZ, Assoc IPENZ, Grad IPENZ and Stud IPENZ. “[I]ncreased self-esteem” is said to have followed the name change.<sup>566</sup>

This mood tied in with worries that the ERA was not protecting the virtues of the profession. Numbers qualifying with certificates and short degrees were rising, and in Australia they outstripped the jobs available. The Council thereafter encouraged members to use the term “Professional Engineer” “to establish a common law title to it” and prevent its use by anyone else.<sup>567</sup>

## ADMINISTRATION AND PUBLISHING ENTER THE COMPUTER AGE

Computerisation had an unexpected effect on membership figures. In 1986, IPENZ proudly announced it had 6,047 members. Moving the membership database to a PC had highlighted an “over-estimation” in some categories a year later, dropping the 1986 figure by 163. However, the ubiquitous annual increase had the Institution breaking the 6,000 members milestone in 1988. The Institution reached the 7,000 figure in 1995.<sup>568</sup>

In 1972, rather than publishing technical papers, the NZIE ran 1,000-word reviews of them, the paper itself being made available to those who wanted it. Demand was still high so a cheaper series of *Transactions* was started in 1974.<sup>569</sup> The first year saw three issues, each with five papers.<sup>570</sup> In 1980 it split into parallel specialist subject editions with members entitled to one free *Transaction* a year.<sup>571</sup>

The NZIE changed its mode of publishing. *New Zealand Engineering* was seen to have become “hide-bound”.<sup>572</sup> TPL had capably handled the magazine from the start, but in 1977 the Institution gave two years’ notice of terminating the arrangement. Wanting more control, the NZIE bought the rights to *New Zealand Engineering* and established its own editorial company, Engineering Publishing Company Limited (EPCO) under Chairman Ingram.<sup>573</sup> The NZIE hosted a function in December 1979 to thank the directors of TPL for their 35 years of hard work, at which the deed of purchase was signed.<sup>574</sup> EPCO changed to setting *New Zealand Engineering* by word processor in 1987.<sup>575</sup>

As well as renting premises from the Institution, EPCO employed a full-time editor, Lance McEldowney. Bringing this function in-house led to a “liquidity problem” which caused subscriptions to increase. Preparing and printing publications were responsible for over 16 per cent of expenditure yet earned only three per cent of income.<sup>576</sup> EPCO soon took on other work – ACENZ’s *The New Zealand Consulting Engineer* and the Institution’s own *Yearbook* – and its advertising soon made it profitable.<sup>577</sup>

## GOVERNANCE REVIEWED

Even though the name was changed to IPENZ in 1982, the Institution's system of governance had been fundamentally unchanged for seven decades (and the Executive Committees for three). On the basis that there is "a healthy questioning of the things we are doing", reform was initiated.<sup>578</sup> The lack of direct technical advice was rectified in 1983 with the creation of Engineering Advisory Committees (EACs) – one each for civil, electrical, technical and chemical engineering.<sup>579</sup> By the end of the 1980s, the Executive Committees relied "greatly" on the advice from the EACs.<sup>580</sup>

The Council had grown to 32 when chairs of the four divisions were invited on, yet it still dealt with minutia.<sup>581</sup> On the Manawatu Branch's suggestion, Professor Kelvin Scott (1920–1990) of Massey University audited the structure. In 1986, he suggested greater use of the secretariat and emphasis on public relations. But rather than reducing Executive Committees, he increased them to four, aligned with continued learning, industrial relations, professionalism and public relations.<sup>582</sup> From February 1989, branch chairs were replaced on the Council by six area representatives, but still the Council remained large.<sup>583</sup>

Technical advice also came from limited-duration Presidential Task Committees, such as those investigating the early-1980s' Ruahihi and Wheao canal collapses and the Maniototo irrigation scheme. IPENZ thereafter committed to investigate all engineering accidents and strengthen the disciplinary actions with quality technical advice.<sup>584</sup>

Investigations into private sector engineering failures, however, met opposition. The Opuha irrigation dam in South Canterbury, for instance, was under construction when it was severely damaged by floodwaters in February 1997. "Within 24 hours, any IPENZ people in the local [South Canterbury] branch who might have triggered an investigation received phone calls threatening them with legal action if they did."<sup>585</sup>

The Council adopted a corporate plan to clarify the aims of the Institution. Paying an honorarium to the President was rejected but hiring professional organisers for conferences was approved.

## REGISTRATION, QUALIFICATION BENCHMARKS AND IPENZ MEMBERSHIP

During the 1980s, IPENZ looked to become the sole qualifying or certifying body for New Zealand professional engineers. This had the potential to change the relationship with the ERB, which registered engineers and issued Annual Practising Certificates.<sup>586</sup> The Institution ran a monitored professional development programme for the ERB, which generated income and at times staved off increases in subscriptions.<sup>587</sup>

During this period, IPENZ gained an unyielding reputation on New Zealand educational standards. It started peer reviewing all New Zealand engineering degrees. This followed complaints about Lincoln's Agricultural Engineering degree in 1980, which was described as

“inadequate”.<sup>588</sup> Graduates had been taught a bit of everything, a member of the review panel recalls, and in consequence the degree “didn’t hit any of the marks very well”. When taken on by employers such as the Ministry of Works and Development the graduates “ended up going into areas such as civil engineering for which they were not primarily trained”.<sup>589</sup> This led to all New Zealand engineering degrees being peer reviewed, for which IPENZ set up panels of experts.

Not all went smoothly. A University of Canterbury professor and IPENZ member at the time, Jos Arrillaga (1934–2009), “took great exception” to the report on his electrical engineering degree. The Panel Chair and New Zealand Post Office Engineer-in-Chief, Gordon McPherson (b.1930), said the course “taught power engineering extremely well but was deficient in light current engineering and electronics”. The report had been naturally shared with the university to make sure it was factually correct, but as Basil Wakelin (b.1941) recalls Arrillaga “obviously thought we were wrong.... It took six months of fairly hard negotiating to get agreement on it. Now, many years later, I heard through the grapevine that he... acknowledged we were right.”<sup>590</sup>

IPENZ advanced towards an exclusive arrangement when in 1988 the ERB required as a prerequisite to registration a pass in the professional interviews which were carried out by IPENZ.<sup>591</sup> The ERB also started recognising all degrees accredited by IPENZ.<sup>592</sup>

New Zealand polytechnic exams were also dropped as qualifying, replaced by IEAust exams.<sup>593</sup> The Admission Committee could use the professional interview and thesis route to admit people with degrees less than the Bachelor of Engineering equivalent.<sup>594</sup>

Another membership issue vexing IPENZ at this time was that of students. Younger engineers had “some reservations... as to the worth of Corporate membership and the difficulties of attaining it”.<sup>595</sup> Few students and graduates presented conference papers any more. Since these two categories had been split in 1939, the graduate numbers had risen to over 1,000 while students plummeted to 20. In 1987, IPENZ discontinued the student category – instead accepting lists of those in the university engineering societies.<sup>596</sup>

Among the divisions, the Municipal Division had discussed its relationship with the New Zealand Institute of County Engineers (NZICE) since the 1960s but saw no benefit in merging. Common welfare matters and the rise in urban activities of county engineers were discussed in the 1970s. IPENZ was “reluctant to have any closer formal liaison” with the NZICE, but did exchange liaison members.<sup>597</sup> A merger was formally discussed from 1983 and in September 1987 the Association of Local Government Engineers of New Zealand (ALGENZ) was formed. ALGENZ aimed to “uphold and improve the status” of its members and “retain a close liaison” with IPENZ.<sup>598</sup> The following year, ALGENZ became a technical group of IPENZ representing 207 councils (reduced to 74 as a result of the local government reforms of 1989). From 2000, ALGENZ traded under the name INGENIUM, and from 2005 has joined IPENZ and others in sponsoring the New Zealand Engineering Excellence Awards.<sup>599</sup>



*Women engineers session at IPENZ Conference, Nelson, 1994.*

*IPENZ Collection. Front row: Gretchen Kivell, Liz Godfrey, Mary Earle, Liz Angelo-Roxborough, Christine Wilkinson.*

## WOMEN IN ENGINEERING

For the first half of its life the Institution remained resolutely male. No formal bar existed to women members but the norms of society steered them away from engineering. Ladies' committees laid on special entertainment during conferences and one group of wives called themselves "Femineers".<sup>600</sup> Rhona Thorpe was the first in print to challenge *New Zealand Engineering's* entrenched sexist language in 1981.<sup>601</sup>

The Institution did not record its first female member. Membership lists did not identify gender and gave only forename initials. Pat McCook was mentioned in 1955 as the first woman in New Zealand to qualify as a professional engineer, but that was based on her admittance to IEE: she did not join the NZIE but was listed as a "friend" of the Electro-Technical Group.<sup>602</sup>

Engineering was traditionally associated with machinery and dirt, making it apparently unwomanly.<sup>603</sup> Diversified courses in the 1970s attracted more women to engineering, particularly at Lincoln's Agricultural Engineering faculty. Further broadening of the disciplines then presented greater opportunities, such in people-focused roles, water, conservation, chemical, alternative energy and food technology.

The School Liaison Committee campaigned for more women to try engineering in the 1980s, and showed an Australian video "Women in Professional Engineering".<sup>604</sup> Overseas, similar campaigns increased female enrolments by six per cent.<sup>605</sup>

By 1983, 37 of IPENZ's 5,790 members were women (or 0.64 per cent). Only 0.5 per cent of engineers were said to be women but most people agreed that both figures needed to rise. An Auckland Branch survey in 1987 at least asked the gender question, but found

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only five women were members or registered engineers (out of more than 1,000). They were all under 40 (three in their 20s).<sup>606</sup> The Institution's 1988 conference formally discussed the issue leading the following year to sexist language being outlawed.<sup>607</sup>

Gretchen Kivell (b.1948) broke several barriers by becoming the first woman to lead a committee (Schools Liaison), branch (Auckland, in 1984) and the Institution itself, as President in 1998.<sup>608</sup> Her rejection of the title "Chairperson" caused much correspondence but foreshadowed a debate about honorifics, later made prominent by Prime Minister Helen Clark (b.1950) who rejected titles based on marital status.<sup>609</sup> On the centenary of women's suffrage in New Zealand, five women were honoured as pioneering leaders for women engineers: Jenny Culliford (b.1947); Mary Earle (b.1929); Barbara Elliston (b.1962); Kivell; and McCook.

Other organisations formed to welcome women into engineering: the Association of Women Engineers in the early 1990s and Women in Engineering Incorporated at the University of Canterbury in 1999.

Despite this promising start, the rise in women in engineering faltered. Those who qualified found a "concrete ceiling" preventing their promotion. A woman consultant who wrote of this withheld her name for fear of career retribution.<sup>610</sup>

Once in engineering, a higher proportion of women than men leave the profession. Research suggests that 29 per cent of women leave the profession within 10 years of graduating, compared with 18 per cent of men.<sup>611</sup>

In 2011, IPENZ President Garry MacDonald (b.1953) launched an affirmative action plan and programme focused on supporting and encouraging women to enter, remain and advance in the engineering profession. At the time of launch, the programme was chaired by Elena Trout (b.1952). The programme is broad and focuses on research, leadership, culture and recognition.

IPENZ says 13 per cent of engineers (and eight per cent of Chartered Professional Engineers) are women. These figures are set to rise, with 21 per cent of graduates completing bachelors or honours degrees in engineering being female.<sup>612</sup>

## ETHNIC DIVERSIFICATION OF THE PROFESSION

In its first several decades the Institution presented a very monocultural face. From the 1960s and '70s, after the environmentalists and feminists came another voice – Māori. Few Māori engineers were members but Māori issues started to enter the Institution's consciousness. The Water and Soil Conservation Act 1967 elicited Māori and other objections to inappropriate use of water. These grew in the wake of "Think Big" projects. In 1983, Ian Gunn said traditional Māori values "had been added to the engineering process" through the effect of two wastewater disposal projects.<sup>613</sup> Yet a credibility gap still existed that would only be filled by more consultation between engineer and Māori communities.

At that time, one per cent of Canterbury's School of Engineering was Māori, much less than the five to nine per cent of the population in that age group, but only slightly less than the 1.4 per cent enrolled in all faculties.<sup>614</sup>

A High Court case in 1974 increased the weighting given to value judgements over loss of resources against other requirements (such as an engineer might advance). Māori issues gained ground in other cases and legislation. But these were still issues that the planner or commissioner of a project might deal with – they were not yet considered to be an engineering responsibility. How, for instance, could an engineer respond to a *taniwha* (a metaphysical subject of mythology)? Engineers began to realise they needed to “make a greater effort to live in harmony with the world and less effort to dominate and exploit it”.<sup>615</sup>

Māori viewpoints started to be heard, at first from ESocR and in water-related gatherings.<sup>616</sup> The 1990 IPENZ conference discussed these issues and published them as “Māori Issues and Engineering”.<sup>617</sup> In the same year, IPENZ's 1990 heritage project did not celebrate any Māori engineering sites (adding the first to the engineering heritage database only in 2008).<sup>618</sup> The need for consultation was built into the Resource Management Act in 1991. This and descriptions of New Zealand as bicultural were shouted down by some members as “a cult being imposed upon” them, but *New Zealand Engineering* opened the way for ongoing debate.<sup>619</sup>

Morris Love of Te Atiawa (a lapsed engineer who had taken up cultural consulting) continued the discussion in a series of articles such as “Talking Turkey with the Tangata Whenua”.<sup>620</sup> These covered Treaty settlements, *kaitiakitanga* (guardianship), *tino rangatiratanga* (sovereignty), *waahi tapu* (sacred sites) and Māori claims to intellectual property and other *taonga*. Love quietly argued that there was “a strong sense of grievance felt by Māori” and that greater collaboration was the way forward.<sup>621</sup>

In 2000, Kepa Morgan of Te Arawa said much work was needed, with engineers still seen by Māori as “environmental and cultural terrorists”. He cited The University of Auckland student engineers' *haka* affair (from 1979) and central and local government insensitivity to Māori concerns about development. With not enough Māori entering the engineering profession, he urged “chang[ing] its ethnic make-up from within”.<sup>622</sup>

Unlike many bodies in New Zealand, IPENZ did not immediately adopt a Māori name or change token elements (the name *Pūtahi Kaiwetepanga Ngaio o Aotearoa* was introduced quietly in 2006). IPENZ is now more inclusive of Māori and Pasifika engineers (including active support for SPIES, the association for Polynesian engineering students launched in 1993). A founding member of SPIES, Tyrone Newson (b.1972), was the 2007 New Zealand Young Engineer of the Year.<sup>623</sup>

In 2006, approximately five per cent of architects, engineers and related professionals were Māori and six per cent of physical science and engineering technicians were Māori. These figures were slightly lower than for all occupations, for which 11 per cent of workers were Māori.<sup>624</sup>

Graduation figures are similar. In 2012, approximately 10 per cent of those completing an engineering diploma were Māori and seven and four per cent of those completing a bachelors or honours degree in engineering were Māori respectively. These figures are lower than for all fields of study for which 20 per cent of those completing a diploma were Māori and 12 and nine per cent of those completing a bachelors or honours degree were Māori respectively.<sup>625</sup>

### DEREGULATION AND CORPORATISATION

The 1980s had a bigger effect on engineers than in any previous decade – through corporatisation. Market deregulation required the disbandment of state agencies that built the infrastructure and delivered utility services.<sup>626</sup> Most engineer-employing departments were broken up and their trading operations sold to private enterprise. This included the Electricity Division of the Ministry of Energy, the Ministry of Works and Development (MWD), New Zealand Railways, New Zealand Post Office, the New Zealand Forest Service, and Lands and Survey Department. IPENZ argued that winding down the MWD was “fallacious” but got no notice.<sup>627</sup> Bob Norman, a former Commissioner of Works and IPENZ President, fought a rear-guard action, but MWD’s days were numbered.<sup>628</sup> ACENZ came to see Works Consultancy, which took over MWD operations, as a competitor.<sup>629</sup>

When appointed to Electricorp’s public relations role, Judith Aitken characterised the employment shake-up (as well as the feminist revolution) by saying she “would no longer indulge ‘the fantasies’ of engineers who liked to build dams”.<sup>630</sup> The top echelon of engineers who had run the electricity system “was quietly dumped”.<sup>631</sup>

IPENZ formed a President’s Task Force on State-owned Enterprises (SOEs) under Derek Cooper Rose (1922–2002) in 1988 to look at the impact on engineers, but its dire predictions of redundancies did little to stem the reforms.<sup>632</sup>

The replacement SOEs or corporations could spend their money how they liked, “as irresponsibly as they liked, and some did”.<sup>633</sup> They dropped their training programmes that nurtured future engineers and no longer considered membership of costly professional bodies such as IPENZ a necessity for their remaining staff.

Symbolic of the risks of reducing engineering core values was the Cave Creek disaster in April 1995, in which 14 young people died. The simple viewing platform could have been prevented from falling with, in Prime Minister Jim Bolger’s (b.1935) memorable words, “about \$20 worth of bolts”.<sup>634</sup> Systemically, it was a result of removing a requirement to use registered engineers for such work when the Department of Conservation was formed in 1987. Up to that point, Forest Service engineers had provided those services but they had been decimated.<sup>635</sup>

The deregulation of local government also had a direct consequence seen in the 1998 Auckland power supply failures, specifically through the removal of systems that analysed

maintenance records and failure patterns. Selling off municipal electricity bodies cut deeply into the core engineering knowledge required for some work. Robert Wilkinson (b.1939) pantomimed how this might have played out: “Funny isn’t it, we have five incidents in the same man-hole in the same joint where there has been a fire. Better put another sticking-plaster on it’. No one stood back and said ‘That’s five fires in one place. What’s going on?’.”<sup>636</sup>

The mood for reform led to resource management, when Member of Parliament Nicolas Smith (b.1964) championed new wide-ranging legislation on water, soil, mining, energy, the environment, town planning, continental shelf and even noise. IPENZ issued the discussion paper “Directions for Change” and made a submission in 1990, as did six committees or technical groups. The main concern was whether the legislation would protect the environment at the expense of engineers’ jobs.<sup>637</sup> The Resource Management Act passed in 1991, putting much responsibility for district planning and environmental protection on the recently-reformed local authorities.

## ENDNOTES

- 561 AR 1962, 9.  
 562 Errol Young, ‘A Sociological Perspective on the Professional Engineer,’ *NZE* 38:9 (October 1983), 15.  
 563 *NZE Conference Supplement* 37:3 (April 1982), 67.  
 564 ‘Report to Council,’ *NZE* 37:12 (December 1982), 46. ‘Statement from the President: IPENZ - New Name for Institution of Engineers,’ released to the media on 16 March and published in *NZE* 37:4 (April 1982), 2. The new name was registered on 2 March by the Registrar of Incorporated Societies. The full definition of ‘Professional’ took three paragraphs, in the Handbook No3. *NZE* 37:5 (May 1982), 51.  
 565 ‘Report to Council,’ *NZE* 36:12 (December 1981), 55.  
 566 Young, ‘A Sociological Perspective on the Professional Engineer.’ Not everyone agreed on Young’s sociological interpretation of the change.  
 567 ‘Report to Council,’ *NZE* 37:12 (December 1982), 50. ‘Reason Behind the Change from NZIE to IPENZ,’ *NZE* 37:4 (April 1982), 40.  
 568 ‘Report to Council,’ *NZE* 41:11 (December 1987), 26-27.  
 569 Report of Council, 1972, 12.  
 570 AR 1974, 12.  
 571 AR 1979, 5. One of the editions focused on civil, structural, water and soil, and the other on electrical, chemical, mechanical and general topics.  
 572 Tony Bartlett in *NZE* 40:3 (March 1985), 42.  
 573 AR 1977, 6.  
 574 *NZE* 35:12 (December 1980), 60.  
 575 *NZE* 42:11 (December 1987), 19.  
 576 AR 1980. *NZE* 35:12 (December 1980), 60.  
 577 AR 1981. *NZE* 36:12 (December 1981), 55. *NZE* 37:6 (July 1982), 11.  
 578 Report of Council, 1980. Quote NZIE President, AM Kennedy, *NZE* 35:12 (December 1980), 56.  
 579 The first EAC Chairmen were PG Scouler for civil engineering, PS Dokter for mechanical, RL Earle for chemical, and PW Blakeley for electrical engineering. *NZE* 38:12 (December 1983), 49.  
 580 *NZE* 44:12 (December 1989), 39.  
 581 R Atkins, letter to *NZE* 42:2 (March 1987), 5.  
 582 *NZE* 43:12 (December 1986), 49.  
 583 Report to Council, 1987. *NZE* 42:11 (December 1987), 26. The Engineering Science EC, remaining largely untouched (though its workload was lightened). The EC for Professional Qualifications became Professional Standards (with Admissions, Examinations, Education, Ethics and Continuing Education sub-committees), and Professional Practise became Employment and Welfare (with Welfare, Statistics, Registration sub-committees). Some sub-committees were reshuffled in 1988. The Industries Division disbanded at the end of 1988, AR 1989, 43.  
 584 The Ruahihi canal, near Tauranga, collapsed in September 1981 and Whaeo, Bay of Plenty, in December 1982. The Maniototo investigation was really a look at Ministry of Works and Development’s Dunedin office. The Institution was represented on the Committee for Local Authority Hydro Development and the Government’s new Major Projects Advisory Group.  
 585 Interview with author (name withheld), 2012.  
 586 *NZE* 35:12 (December 1980), 58, 64.

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- 587 For examples see *NZE* 36:12 (December 1981), 57.
- 588 Basil Wakelin interview with author, 12 July 2012. An agricultural engineering course had started at Lincoln College, 20 kilometres from Canterbury University, in the 1930s and a department created in 1947. The New Zealand Agricultural Engineering Institute formed in 1964 after increasing tractor deaths brought the safety issue to notice. Full degree courses started in 1968, moderated by the New Zealand Educational Institute, with the first graduations in 1970. It not only attracted more women than did traditional engineering (design and mechanisation of agricultural operations), but it also emphasised water conservation, alternative energy sources, safety and resource management. Neutze, *Design for a Century*, 268. *Evening Post*, 23 February 1973.
- 589 Wakelin interview.
- 590 *Ibid.*
- 591 Engineers Registration Amendment Act, 1988. The Board was going through a period of change, its administering body changing from the Minister of Trade and Industry in 1987 to Ministry of Commerce's Building and Development Directorate in 1989. *NZE* 43:11 (December 1987), 49. *NZE*, 45:11 (December 1989), 47.
- 592 These degrees included Massey University's Bachelor of Technology (as offered from 1979), Industrial Technology, or Industrial Management and Engineering (1981). *New Zealand Gazette*, 214 (15 December 1988), 5370.
- 593 *NZE* 37:12 (December 1982), 47.
- 594 *NZE* 39:12 (December 1984), 62.
- 595 *AR* 1980. *NZE* 35:12 (December 1980), 56.
- 596 *NZE* 39:12 (December 1984), 62. *NZE* 42:11 (December 1987), 28, 40. The 24 existing student members evidently were permitted to see their membership out, their numbers falling to 11 in 1991.
- 597 Hansen and Hall, *The County Engineers of New Zealand*, 131.
- 598 *Ibid.*, 124.
- 599 *ED* 37 (May 2005), 3.
- 600 *Evening Post*, 23 March 1970. They chartered a boat for a daytrip in 1970. The term was also used by an author in *NZE* 51:6 (July 1996), 14. The Institution of Electrical Engineers, originally a telegraph engineering society, initially admitted only male members "lest it turn it into a 'dot-and-dash society'" (by admitting the many female telegraph operators). Appleyard, *The History of the Institution of Electrical Engineers*, 29.
- 601 *NZE* 36:4 (May 1981), 2.
- 602 *NZE* 9:3 (March 1955), 102. 'Women in Engineering – a Celebration,' *NZE* 48:11 (December 1993), 19.
- 603 Dr Anne Ditcher, Department of Mechanical Engineering, Canterbury University. *NZE* 39:2 (March 1984), 5.
- 604 *NZE* 38:12 (December 1983), 48.
- 605 Women role models in audio-visual material are said to have increased women in engineering at the University of Calgary from eight to 14 per cent. *NZE Print Out* 37:5 (June 1982), 11.
- 606 IPENZ Auckland Branch Survey, 1987, Box 6, IPENZ Auckland Branch Collection.
- 607 SGM on 11 July 1989, *NZE* 44:5 (June 1989), 28.
- 608 *NZE* 39:2 (March 1984), 5. *NZE* 53:2 (March 1998), 4. Rebecca Ronald was the first female President of the Engineering Society (Ensoc) at Auckland University in 1992.
- 609 Clark insisted on the honorific 'Miss' despite being married. *Dominion Post*, 14 May 2008, B5.
- 610 Author's name withheld by *NZE*. 'This is not an Article about Babies,' *NZE* 50:7 (August 1995), 36.
- 611 'Does Gender Matter: Findings from an online survey and interviews of engineering graduates from 2000 and 2005'; Ministry of Women's Affairs with IPENZ, August 2012, URL: <http://www.ipenz.org.nz/ipenz/forms/pdfs/Engineers-research.pdf> (accessed 14 October 2013).
- 612 'Field of Specialisation for Students Gaining Qualifications,' Education Counts, URL: [http://www.educationcounts.govt.nz/statistics/tertiary\\_education/retention\\_and\\_achievement](http://www.educationcounts.govt.nz/statistics/tertiary_education/retention_and_achievement) (accessed 14 October 2013).
- 613 Ian Gunn, 'The Maori Factor and Effluent Disposal,' *NZE* 38:5 (June 1983) 5.
- 614 DR Gordon, 'Maoris and Engineering,' *NZE* 38:9 (October 1983) 5.
- 615 Judge AR Turner, 'The Changing Basis of Decision-making. Is Reason Sufficient?' *NZE* 40:3 (April 1985), 13.
- 616 Robert Mahuta, 'Maori Viewpoints will need to be Recognised,' *NZE* 43:4 (May 1988), 42.
- 617 *NZE* 45:7 (August 1990), 50. IPENZ also distributed a Treaty of Waitangi brochure.
- 618 BJ Butcher, *Maori Issues and Engineering*, 3. Jono, 22 December 2011, on Timespanner.blogspot.com (accessed 14 February 2013). 'Early Maori Military Engineering Skills Honoured,' *ED* 70 (May 2008), 9.
- 619 Quote Harold C Williams, *NZE* 52:8 (September 1997), 16.
- 620 *NZE* 48:9 (October 1993), 34. Pers Comm, Morris Love to author, 14 December 2012.
- 621 Morris Love, 'Some Murky Corners of Maori Culture' *NZE* 53:8 (September 1998), 11. Love presented an overview in 'The Interface Between Maori and Engineers,' *IPENZ Transactions* 24:1 (1997).
- 622 Kepa Morgan, 'He Wero - A Challenge,' *NZE* 54:9 (January 2000), 46. The University of Auckland engineering students' haka affair occurred in 1979 when a group of Māori denounced the students' haka as racist. Whoever performs it, the haka is intended to inflame passions, and has been emulated by non-Māori for decades in both parody and envy. For Auckland engineering students it was a capping-related and alcohol-driven tradition that had started in 1954. It was emboldened by their return in 1968 to Symonds Street (from Ardmore, where it had moved in 1948). The 'savages-in-grass-skirts' depiction by the Auckland students was offensively Eurocentric and the engineering Dean had tried to suppress it in the 1970s. The violent confrontation orchestrated by He Taua in 1979 served the purpose of exposing and stopping it (and for the violence of their attack the members of He Taua were penalised). The former protagonists met again in May 2009, in an air of nostalgia. *AR* 1977, 12; Basil Keane, 'Ngā rūpū tautohetohe – Māori protest movements – Cultural rights,' *Te Ara – the Encyclopedia of New Zealand* (updated 16 November 2012). *New Zealand Herald*, 2 May 2009.

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- 623 SPIES is a group representing South Pacific Island Engineering Students, including Māori engineering students. *e.nz* 2:4 (July/August 2001), 24; 3:4 (July/August 2002), 24; 4:5 (September/October 2003), 43; 8:5 (September/October 2007), 31; 9:1 (January/February 2008), 19. *AR* 2006, contents page.
- 624 'Minority groups in engineering education,' IPENZ, August 2010, URL: [http://www.ipenz.org.nz/IPENZ/forms/pdfs/Report\\_Minority\\_Groups\\_in\\_Engineering.pdf](http://www.ipenz.org.nz/IPENZ/forms/pdfs/Report_Minority_Groups_in_Engineering.pdf) (accessed 14 October 2013).
- 625 'Field of Specialisation for Students Gaining Qualifications,' Education Counts website.
- 626 Brian Easton, 'Economic History – Government and Market Liberalisation,' *Te Ara – the Encyclopedia of New Zealand* (updated 13 July 2012).
- 627 *NZE* 38:2 (March 1983), 3.
- 628 *NZE* 39:3 (April 1984), 22.
- 629 *NZE* 43:6 (July 1988), 33.
- 630 *New Zealand Herald*, 7 November 1987, 2.
- 631 *Ibid.*
- 632 *NZE* 43:7 (August 1988), 24.
- 633 Wilkinson interview.
- 634 "A bag of bolts reached the site but was never included in the platform structure." 'Commission of Inquiry Cave Creek Report,' Part One, 66. Department of Conservation, [www.doc.govt.nz](http://www.doc.govt.nz) (accessed 15 February 2013).
- 635 *NZE* 51:5 (June 1996), 26 and subsequent letters.
- 636 Wilkinson interview.
- 637 *NZE* 44:1 (February 1989), 39. *NZE* 45:7 (August 1990), 48.



## CHAPTER 7

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# 1990s

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### COUNCIL TO BOARD

Despite the changes resulting from the Scott Report on the Institution's governance model in the mid-1980s, a move to "substantially" reform the operation of IPENZ gained ground at the 1993 conference in Hamilton.<sup>638</sup> IPENZ was still top-heavy, with subscriptions still not aligned to the Institution's financial year.<sup>639</sup>

Despite perennial membership increases, the President said IPENZ was perceived to be "dying".<sup>640</sup> Engineers ranked alongside real estate agents in a newspaper poll of professional integrity. More disturbingly, in an age when the Government had dismantled its main source of engineering advice – the MWD – the respect accorded to IPENZ plummeted. During Robert Wilkinson's presidency, "it was not possible for the President of IPENZ to get an appointment with a Cabinet Minister. We were ignored. We were described by one Treasury official as a 'self-interested guild'."<sup>641</sup>

Determined to change this, Wilkinson wrote a "Pathways" document outlining a new philosophy. The Institution needed wider horizons adapting to changing paradigms. Building infrastructure was now less important than adding value. More tellingly, as well as a need for eco-efficiency, he wanted an ethical framework from which members could find guidance.<sup>642</sup>

Redefining engineering "as the translation of the dreams of humanity, traditional knowledge and the concepts of science into action through the creative application of technology to achieve sustainable development" required a fundamental new approach to IPENZ business.<sup>643</sup>

The reformers said IPENZ should become an umbrella organisation for people and organisations. They wanted to get alongside the Registered Engineering Associates (REA), though IEAust with 10 times the membership was "trying to expel" them.<sup>644</sup> IPENZ could

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not afford to let its role fragment among other bodies. Though the word “technologist” did not appear in the first strategic plan produced in 1994, new membership categories for certificate- and diploma-trained engineers were proposed.<sup>645</sup>

The 1994 conference agreed to a new membership structure. A postal referendum in mid-1994 “overwhelmingly confirmed the desire of the members” for change.<sup>646</sup> Special General Meetings in 1994 approved rule changes to allow the wider membership base and restructure the 29-member Council to a 12-member Board of Directors. The several Executive Vice Presidents were replaced by positions allowing a structured pathway to leadership. Leaders started as Vice President for a year, then Deputy President and, after their one year at the top, as Immediate Past President. The other eight Board members were appointed for two-year terms, four being replenished each year.

IPENZ was a “complex entity” in the form of “an umbrella for an increasingly diverse range of disciplines that comprise teams represented in professional engineering and technology today”.<sup>647</sup> Accountable to the membership, the Board’s job would be to identify, define and implement the Institution’s goals in a cost-effective manner. Excellent communication with members would mobilise them to be involved – and the over-arching goal was to make membership of IPENZ “natural and essential” for everyone associated with professional engineering and technology in New Zealand.

The Board’s role was governance. The President led the Board and Board members were given portfolio and regional liaison responsibilities (replacing the Area Councillors). Having gained stakeholders, the Board would set the goals and draft policy to achieve those goals. The Chief Executive, appointed by the Board, undertook the management role to get the job done. Staff numbers, including EPCO’s, increased to 15 – including new managerial directors.<sup>648</sup> A “plethora of bureaucracy” was removed.<sup>649</sup>

Less was to be expected of members because “it was becoming increasingly difficult to obtain [their] quality and timely voluntary contribution”.<sup>650</sup> Days of “heroic volunteerism” were over.<sup>651</sup> Only 10 per cent of members were active, the rest flicked through the magazine and basked in their post-nominals.<sup>652</sup> IPENZ disbanded the decades-old Executive Committees and the EACs. It replaced most standing committees with task groups of limited-duration (such as a recruitment task force in place of a membership committee).

The new Board first met in February 1995 during the Nelson conference. Its theme of “Adding the Value” had been achieved, ironically by subtracting Board positions (and two more were removed in the late 2000s when the 11th and 12th directors became discretionary appointments). In contrast, the technical groups were felt to be the true driving force behind a learned society. They had been “neglected in the past” and with barriers to communications that led to “a feeling of isolation and detachment”. Now IPENZ aimed to “give them all the authority and responsibility with which they can cope”.<sup>653</sup>

## HERITAGE MATTERS

The Institution has always been conscious of the historic value of engineering, many of its members' projects being the first, biggest or best of their type. This was especially so in a pioneering setting and, while members had contributed to some engineering histories, a need arose to preserve details of the sites themselves. An engineering heritage committee had existed in Christchurch since 1983 but the 1990 sesquicentenary project was



*IPENZ's Engineering to 1990 plaque unveiling, Addington Water Tower, Christchurch, 1990.  
IPENZ Collection.*

the first to recognise engineering heritage sites on a large scale. A 1990 committee formed for the task to mark 150 sites relating to transport, utilities, business and infrastructure during New Zealand's 150th anniversary. Alan Winwood (b.1948) of Auckland co-ordinated the project, which raised sponsors for each site.<sup>654</sup> In fact, only 68 received a plaque but this nonetheless increased public understanding of the role engineering played in developing New Zealand. Nigel Stace wrote it up as *Engineering to 1990*.<sup>655</sup>

Two years later, the Christchurch committee was redesignated the National Engineering Heritage Committee (NEHC). It hosted the first Australasian Engineering Heritage conference in 1994 (the second was in Auckland in 2000, third in Dunedin in 2009). Chapters also formed in the other centres and they soon agreed that the status of the National Committee should rotate around the main chapters. Auckland got the honour in 1996 and Wellington in 2001. Robert Aspden (b.1938) was long-time chair and other engineering heritage bodies were represented.

The NEHC established an online database and Register of sites and pioneer engineers, and assisted Chapters with printed and oral histories. It also supported conferences such as the 2004 National Historic Heritage workshop.<sup>656</sup>

In its centralising mood of the 2000s, IPENZ felt engineering heritage would get better strategic direction from a formal Board, which it created on 1 April 2008. The Board comprises the Chapter chairs, New Zealand Historic Places Trust and Department of Conservation representatives and up to three nominated by IPENZ's Board. An early task was a five-year strategic plan. IPENZ's involvement in heritage activities was further strengthened in 2010 with the creation of a Heritage Advisor position.

The Engineering Heritage Board's first Chair, Robert Wilkinson, found the role, including attending many funerals, "a rapid learning curve".<sup>657</sup> One of the Board's first events was co-

hosting the “Taihape event” commemorating the North Island Main Trunk centenary, with Opus International Consultants.

Following the success of its “Heritage Walks” brochure, the Auckland Chapter decided in 2009 to expand that engineering heritage story into a book. The breadth of experience of its members and contributors covered the engineering fields and their writings were professionally edited. The Chapter’s relationship with IPENZ National Office strained over design and printing but the final product is a credit to both bodies – and to the fundraising efforts of Ingram. *Evolving Auckland – The City’s Engineering Heritage* edited by Chapter Chair John La Roche (b.1937) was launched at Auckland Public Library on 29 November 2011.<sup>658</sup>

### NEW BROOM: MEMBERSHIP AND ORGANISATIONAL CHANGES

The early 1990s’ reforms saw IPENZ create new categories of Technical and Associate member, and simplify the joining procedures. A Practice College was on the books, and voting rights were extended to all members (except students and affiliate members). Any member could stand for the Board though the leaders (Vice, Deputy and President) had to be Fellows. Graduate membership was extended to a wider range of tertiary qualifications, and student membership recreated (it surged thanks to enthusiastic deans at the three universities).<sup>659</sup>

Changes to staff skills took a little longer. IPENZ employees had essentially been a secretariat carrying out the wishes of the Council and committees. They now became an executive to develop and implement policy under the governance of the elected Board. The four directors appointed in 1992 in engineer practice, qualifications, information and membership services were renamed managers.

The National Office structure was reviewed in 1995/1996 by Ray Lind Consultants. The new broom brought in a new Chief Executive after Armour Mitchell (1939–2005) did not renew his contract. Lind suggested the Chief Executive should have professional engineering qualifications which the Board accepted in October 1996, and started head-hunting.<sup>660</sup> Some senior staff took redundancy.

Later in the 1990s the technical members were split into two groups, Engineer Technologists and Engineer Associates. Many Technical members saw this as a downgrading and resigned.<sup>661</sup> One Registered Engineering Associate said the Associate member category “smacked of second-class membership”.<sup>662</sup>

More was expected of all members in terms of remaining competent. Continuing professional development was added to the need for current competency and heavily promoted.<sup>663</sup>

The category of Distinguished Fellow was created in 1996.

## MONEY TROUBLES AND MORAL DEFALCATION

Reformist zeal almost corrupted IPENZ in the mid-1990s. To boost membership, the Board embarked on an ambitious public relations programme. A new brand was approved.<sup>664</sup> It cost a lot but elicited few new members. When Chief Executive Officer Warwick Bishop (b.1941) started in April 1997, “the place was nearly broke. In fact the Auditors wouldn’t sign it off, saying ‘You *are* broke.’ So it was pretty grim.” With so much capital invested in its property, the Institution was cash-strapped and looking at a \$693,000 deficit. “So it was ‘lock up the cheque book, lock up the order book’”<sup>665</sup>

Within a few days Bishop had talked with the bank, which helped them out for a few months, and re-valued Molesworth House. But most assets were invested capital, not ready cash.<sup>666</sup>

The point was reached when the cashflow could not cover salaries, so the decision was taken to dip into some of the reserves. The only problem was the reserves, though technically Board money, were morally those of the Technical Interest Groups (TIGs). Eighteen groups had an accumulated \$623,846 in reserve.<sup>667</sup> The Board of the day “used the TIGs reserves without permission,” Andrew Cleland (b.1955), the succeeding Chief Executive, says. Many were justifiably upset. They “persuaded the Board to hand over their reserves”, the moral right to which has never again been questioned.<sup>668</sup>

“That led to a lot of societies leaving, de-incorporating. The Structural Engineering Society left, Geotechnical Society left, some were on their way out anyway...”<sup>669</sup>

The branches also had their own bank accounts. They held deposits of over \$100,000, which as part of a revamp the National Office felt was better administered centrally. In 2003 IPENZ gave each branch a use-it-or-lose-it budget and said “your current reserves, your bank account, is yours to do with what you want until 2007. We got to 2007 and they had done almost nothing with it so we compulsorily transferred all that was left to the [IPENZ] Foundation. We still have grumbles... that the branches should own their funds.”<sup>670</sup>

The Auckland Branch was separately incorporated. This had occurred in 1962 when legal action against it was feared and incorporation was seen as necessary to protect the Institution.<sup>671</sup> It was de-incorporated in August 2005 after the centralising of branch funds had started.

## ENDNOTES

638 *NZE* 50:5 (June 1995), 18.

639 *AR* 1993, 5. *AR* 1992, 2.

640 Robert Wilkinson, Council Minutes, 5 February 1993, 7.

641 Wilkinson interview.

642 Council Minutes, 7 April 1993, 3.

643 ‘Broad church’ term, *NZE* 51:8 (September 1996), 6.

644 Council Minutes, 10 December 1993, 1.

645 Council Minutes, 21 September 1994, 1. The plan was based on a version from the Hong Kong Institution of Engineers.

646 *Ibid.*

647 Quote from *NZE* 50:5 (June 1995), 18. *AR* 1992, 4. *NZE* 49:3 (April 1994) 2.

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- 648 AR 1993, 20. 12 were women.
- 649 Francis Small editorial, *NZE* 52:2 (March 1996), 2.
- 650 *NZE* 50:5 (June 1995), 18.
- 651 Andrew Cleland interview with author, 29 January 2013.
- 652 Council Minutes, 5 February 1993, 7.
- 653 AR 1994, 2.
- 654 IPENZ had also helped in a search for engineer subjects for the *Dictionary of New Zealand Biography*. *NZE* 43:8 (September 1988), 16; 44:1 (February 1989), 6.
- 655 Later, IPENZ assisted a commercial book on the subject: Matthew Wright, *New Zealand's Engineering Heritage 1870-2000* (Auckland: Reed, 1999).
- 656 The Auckland Heritage Chapter published *Heritage Walks: The Engineering Heritage of Auckland*, in 2006. *Engineering Heritage Newsletter* (October 2008), 7. National Historic Heritage Workshop, Wellington, August 2004. The Engineering Heritage website is the main repository for IPENZ's heritage work ([www.ipenz.org.nz/heritage](http://www.ipenz.org.nz/heritage)). In September 2013 there are 12 items on the Register reflecting their outstanding or special engineering heritage status, with another 169 items recorded. There are 70 engineer's biographies.
- 657 Quote *Engineering Heritage Newsletter* (March 2009), 13.
- 658 John La Roche interview. Robert Aspden interview with author, 18 September 2012.
- 659 AR 1994, 4. The Practice College existed only as a notional concept which from 2003 allowed members who were deemed competent to voluntarily list their practice field as one of 12 (later 17), after their post nominal, i.e. MIPENZ (Civil). This 'extended post nominal' has since been discontinued. *ED* 13, 6. Andrew Cleland notes, 28 March 2012, unpublished manuscript. IPENZ. Retired members were counted for about five years but in 2002 they were distinguished as a membership 'status', not class (along with life and low-income members).
- 660 *NZE* 51:10 (November 1996), 2.
- 661 Andrew Cleland notes.
- 662 Pers Comm David Hoffman to author, 22 February 2012.
- 663 AR 1994, 13.
- 664 Francis Small, editorial, *NZE* 51:2 (March 1996), 2.
- 665 Warwick Bishop interview with author, 4 February 2013. AR 1997, 24. Bishop was an electrical engineer, formerly Chief Executive of the Meat Producer Board and before that Works and Development Services Corporation Limited.
- 666 Ibid.
- 667 AR 1997, 28.
- 668 Cleland notes. The reserve draw-down was in 1997, was shown in 1998 as 'Loans to IPENZ' of \$425,000, which was still being repaid two years later. AR 1998, 32. AR 1999, 4. The Transportation Group subsequently used its reserve to publish its 1954-2006 history, *A Wheel on Each Corner*, by Malcolm Douglass (2007). Pers Comm Malcolm Douglass to author, 12 February 2013.
- 669 Cleland interview. AR 1999, 10, says some TIGs incorporated "to minimise the financial risk to their members".
- 670 Cleland interview.
- 671 In 1979 the NZIE limited its exposure to legal expenses incurred by members, which their professional indemnity insurance was supposed to cover.

## CHAPTER 8

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# 2000s

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The year 2000 coincided with the arrival of Andrew Cleland in September. He was younger than previous Chief Executives and already globally renowned in refrigeration and food engineering. “The Board was looking for something new,” he says. He got right into his strides writing his first annual report after three weeks.

The first year I aimed to eliminate the poor value spend of the membership dollar... We got a half million dollar surplus on a \$2 million budget. We simply stopped doing some things, and did some things differently. We were in a falling-membership situation. In fact, there was an algorithm produced to show how much smaller the membership would be the following year. And how much the income would reduce by. We quickly got information out to members to tell them how we spend their dollar.<sup>672</sup>

Four out of the next five years saw membership increases. After tackling the retention issue, and placing a focus on attracting younger people into engineering, he looked to the legislation that underpinned the profession.

### CREATING CPENG

For years, Alan Bickers (b.1945) and Robert Wilkinson agitated for a major overhaul of the ERA.<sup>673</sup> This led to action in 2000. By then, the consulting engineering sector earned more in foreign dollars than did the wine industry, and the need to protect the international quality standard of engineers was obvious. President Anthony Gibson’s (b.1942) logic was that engineers were key to wealth creation but had a softer obligation to “actively contribute to the wellbeing of society”.<sup>674</sup> A seam of quality professional engineers had “the power... to change and lift this nation” but first their hallmark of quality needed to be updated and internationalised.<sup>675</sup>

Over the years, many attempts had been made to improve the existing Act. Even the ERB tried in 1994 but came to the same conclusion – new legislation was required.<sup>676</sup> Throughout

## AN EVOLVING ORDER

the late 1990s IPENZ attempted to start the process, drafting new legislation through the Ministry of Commerce, but each time got knocked back.

The National Government of the day also desired progress but lost the 1999 election. This, however, threw up an unexpected bonus. Nick Smith and Philip Heatley (b.1967), the only engineers in Parliament, kept a close eye on the issues of interest to IPENZ. Aware that new legislation was needed and given the freedom by a move to the Opposition benches, Smith hurriedly drafted a private member's bill over the summer months.<sup>677</sup> Following closely the Institute of Chartered Accountants Act 1996, this would introduce accountability, transparency and reduce regulatory powers to a minimum necessary for public safety. It would disestablish the ERB and its statutory departmental oversight. Out would go the old Annual Practising Certificates which had no requirement for updated learning or competency and had become "a gigantic paper war".<sup>678</sup>

Instead, a register of Chartered Professional Engineers would be run by a registration body (pointing to IPENZ), which would also apply codes of ethics and discipline to the profession's behaviour. As well as creating an internationally-recognised title – of Chartered Professional Engineer (CPEng) – it would ensure the CPEng qualification was maintained to a high standard, with "no possibility of renewal by incompetent and out-of-touch engineers".<sup>679</sup> Engineers would have to agree to a clear code of ethics, discipline and practices with regard to safety, the environment and financial integrity. For international consistency, it would recognise the Washington Accord and other agreements on skills' mobility.

Though the obligation on local authorities to employ only registered engineers would drop (they only had to do so anyway on public works of over \$130,000 in value, far lower in comparative value than the £10,000 ordained in 1944), IPENZ had already "taken a lead on raising the importance of employing appropriately qualified professional engineering staff and consultants", setting these out in its risk policy published in 1999.<sup>680</sup>

Smith's draft was drawn from the ballot of private member's bills (in the law-makers lotto). With such luck, Smith joked that "God must be an engineer".<sup>681</sup> In fact, Smith had engineered the odds, working fast to get his Bill into an early ballot which he knew (with a new Government slow to get drafting) would contain the fewest bills. In fact, it had only four, from which two were drawn (the next ballot, in contrast, contained around 40 bills).<sup>682</sup>

A road show drummed up support and awareness among engineers, both members and non-members. President Gibson and Smith visited 18 centres where they also sought input for rules, standards and profiles of competency which would have to be defined. The Bill went before the Commerce Select Committee, which heard 24 submissions (including IPENZ in support). Showing unusual support for an Opposition Bill, the Government then insisted that the proposed regime be a monitored one, whereas the chartered accountants' model was unmonitored. This would require a separate council to oversee the stand-alone registering body. After consultation with IPENZ, ACENZ, the ERB and the Ministry of

Commerce, the Bill was redrawn to remove “shortcomings”.<sup>683</sup> The result was an industry-driven measure with wide sector support. Associate Minister of Labour Laila Harré (b.1966) received the second draft in October 2000. The redrafting process had required compromises on procedural matters “but, importantly, none on matters of principle”.<sup>684</sup> It “reassured the Minister that engineers would not have unbridled power”.<sup>685</sup>

Smith questioned the need for a CPEng Council and suggested it could be a Crown entity rather than a statutory body. In the heat of House debate, Smith interpreted the desire for regulatory oversight to mean “that the Government does not trust” IPENZ, a claim the Government rejected.<sup>686</sup> IPENZ could have worked with an unmonitored model but accepted the change.

Details were thrashed out in tense discussions. Over the approval of standards, the wording agreed was that the Council “must approve if it has reasonable grounds to be satisfied” that IPENZ was following requirements. On competence standards, IPENZ favoured an outcomes-based approach, but the final included the wording “standards relating to knowledge and skills”. For current definitions of competency, the proxy of continuing professional development was viewed as flawed, so Andrew Cleland added that applicants had to “demonstrate” their current competency.<sup>687</sup> This need to impose periodic reassessment for continued registration was probably driven by the recent Gisborne under-reporting of cervical smear abnormalities.<sup>688</sup> Engineers would become the first profession to adopt it. In this regard, New Zealand “became world-leading....”<sup>689</sup>

A private member’s bill had its downsides, including lower priority in Parliament’s legislative programme. This saw the CPEng Bill constantly delayed. IPENZ and Smith persuaded all seven political parties to support it, so that when it went back to the Select Committee and into the House, it progressed easily.

Considerable delay took it into election year 2002 without the Bill passing. Then a stroke of luck intervened. The Bill required a third reading and the House to sit as a committee, not normally done on the same day. Cleland’s wife got word that rumours of an early election were true from an indiscreet senior source close to the Labour government. This alerted Smith to Wednesday 29 May 2002 being the last day of the session on which a private member’s bill could be passed. His whips did a deal with Labour and the Greens (via the Business Committee) and the Leader of the House, and “collapsed the debate” on other bills (including one on trans-shipping nuclear waste) to get progress on CPEng.

Cleland was anxiously sitting in a rental car in Napier – listening to the debate on the radio.<sup>690</sup>

The House committee... rose for dinner and when they came back they did this Greens thing and we [the CPEng Bill] got back into the House at about half past eight and then this idiot got up and started speaking.... The House [normally] rose at 10 o’clock and we’d got to about half past nine, and these [Labour and Act Party] people were just using it

for a grandstand, four to five inconsequential speeches and it was going to pass, and we had half an hour to spare, and then it went on to the next Bill and it [the CPEng Bill] just disappeared! It was touch-and-go, he'd [Smith] pre-organised it so that the deal was to get both House and Committee on the same night he had to get other things shifted and the order papers rearranged.... That made it quite tight.

Had it gone beyond 10.00pm, the CPEng Bill would have got caught up in the early election – which was announced a fortnight later – and the Bill would have been delayed into the next session – possibly for another year.<sup>691</sup> Smith received the gratitude and respect due, including the IPENZ President's Award that year.

### THE CPENG SEA CHANGE

The CPEng Act became law on 1 July 2002. "After nearly 80 years, the old, comfortable, cheap, but increasingly outdated registration system" disappeared and in its place professional engineers got "a modern, internationally benchmarked framework within which to identify their currency and competence".<sup>692</sup> IPENZ was appointed the registering authority, working to the new CPEng Council. The Council comprises six-to-eight members of whom three are nominated by IPENZ and one by ACENZ. From 1 January 2003, when the new CPEng Register was opened by IPENZ, no more registered engineers were approved and, from 31 December 2003, use of the old title became illegal. After months of work, the rules and standards were agreed by all parties (and they have the legal standing of regulations). Nearly 1,000 Chartered Professional Engineers were created in the first year, and 800 in 2004.

The Act required engineers to work only within their area of specialisation, and it established a robust complaints process that the public could use.

"The Board of the day was really quite happy to take what would be seen today as enormous risks. So really we plunged on out there," Cleland says. "They knew they had to change and this was the best offer.... It was a leap of faith."<sup>693</sup>

To gain the CPEng quality mark, engineers still do not need to be members of IPENZ (unlike accountants, lawyers and doctors with their professional bodies). The whole process had cost IPENZ about \$300,000. The Institution initially feared that CPEng might compete with MIPENZ, which IPENZ promoted heavily along with its internal continuing professional development process (as required for the fledgling Practice College concept). Over time, the percentage of CPEng engineers also being members of IPENZ has grown and IPENZ now promotes the holy trinity of engineering letters – CPEng, MIPENZ and IntPE (International Professional Engineer Register).

Corporatising a statutory function was not new but it showed faith in IPENZ as a just body that was considered well capable of running such a scheme. Hearteningly, a growing number of bodies which regulate engineering work have opted to use CPEng as a model for their quality benchmark.

With the advent of CPEng, a strong and silent New Zealand tradition quietly passed away. The ERB ceased to exist in 2003 (under Jenny Culliford) after eight decades of ensuring that a New Zealand engineer was a respected professional. For all those years, half the Board were IPENZ nominations but most often all six were members. The Chartered Professional Engineer Council (CPEC) took over seamlessly from the ERB, from which Stephen Reindler (b.1953) stayed on to become the first Chair of CPEC.

In the CPEng era, IPENZ wears two hats. This is not uncommon in the small world of New Zealand. One hat is as the Registration Authority for CPEng, a function overseen by CPEC. The other is as the professional membership body representing engineers in New Zealand, and in that capacity IPENZ can still nominate members to CPEC. This might seem to be a conflict of interest but because CPEC is bigger than the old ERB, the three IPENZ nominees cannot dominate it. What is dominant is engineering professionalism and integrity – because most members of CPEC are long-term members of IPENZ and other engineering bodies.<sup>694</sup>

## MEMBERSHIP CLASS AND GROUP INITIATIVES

While CPEng was still in its parliamentary process, Cleland initiated reforms within IPENZ. After widespread consultation the membership structure was changed. The term “Professional Member” was coined, for those passing their Professional Review (as the interview had been renamed in 1996). A grouping of graded memberships was created for the Professional and Technical members.

The pre-nominal “Ingenieur” was trademarked in 1999 for possible introduction as a formal title. Possibly in response to the CPEng title, it was approved for use from 1 January 2003 for paid-up MIPENZ and FIPENZ irrespective of current competence. It conveyed a sense of learning, carried no association with trades and was gaining currency overseas (particularly in Asia).<sup>695</sup> The uptake, however, has been small in a society where *not* displaying honorifics or letters to which a person is entitled is considered the height of modesty.

A young engineers’ programme was also launched in 2003, known as yENZ.<sup>696</sup> Student membership was again made attractive – resulting in student engineering chapter numbers rising seven-fold. Later they were revised to form Student Engineers New Zealand (SENZ).

The technical groups were split into two kinds: true subsidiaries of IPENZ which became TIGs, and separately-incorporated bodies which were called Collaborating Technical Societies.<sup>697</sup> These were given the opportunity to de-incorporate and become a TIG, but none did. Previously, only some of the people involved in the technical groups were members of IPENZ. But as some of the TIGs were associated with autonomous parent bodies, people in those could and did represent themselves as members of an IPENZ TIG, essentially “free-loading on the membership brand”. A change to the rules in 2008 attempted to clarify this, but it is still a vexed issue whether a TIG member has an association with the parent body.

## AN EVOLVING ORDER

In 2008, IPENZ confirmed its move away from quality marks that specified a field of expertise. This was because engineering was “so multi-disciplinary that unique fields cannot be defined” and that truly professional members can “self-certify their competence”.<sup>698</sup>

Entering the CPEng era again raised questions about the wider engineering family, particularly the middle group of REAs who still have their own act (the Engineering Associates Act 1961) and whose REA Board still occupies space in Molesworth House once shared with and owned by IPENZ.

A technical group of graded memberships was soon split into Engineering Technologist and Engineering Associate categories for people with three-year and two-year qualifications respectively. This was unpopular and the titles soon reverted to “Technical Member” and “Associate Member”.

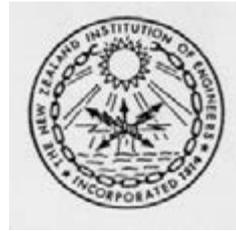
The middle group of engineers was hit hard by the corporatisation of the 1990s. The two-year NZCE qualification required two additional years of practical experience, but dismembering the government departments which normally employed them made this almost impossible. From a peak of 3,000 REAs, the number now registered has fallen to around 1,400. Membership numbers of Engineering Associates and Technicians/Technologists within IPENZ are slowly growing.<sup>699</sup>

Possible multiple tiers of competence are being discussed to recognise the range of engineering qualifications (including a new two-year New Zealand Diploma in Engineering launched in 2012). The “Pathways” document of two decades ago suggested that Professional Engineers will always supervise Engineering Associates or Engineering Technicians: this “is a nonsense”, Cleland now says. “We need career paths for those people. They are alternatives, not assistants, to professional engineers; they simply undertake less complex work.... The people in those groups were quite disillusioned because the professional engineers wanted to keep them down and my view was not to keep them down but to work with them and understand each other’s roles.” New IPENZ competency registers were opened for Engineering Technologists and Associates in 2006.<sup>700</sup>

These are parallel to the CPEng register – but not under the CPEng Act. IPENZ has argued that CPEng is a good model for the REAs and does want to become more representative of and relevant to them. “We’ve argued it would be better not to have two separate registration acts; have one act with multiple tiers. Of course, if we had one act and IPENZ was made the Registration Authority then the REA Board would be surplus to requirements.” Having said that, Cleland acknowledges that the middle group doesn’t “want to be big-brothered. It’s a landscape of clutter.”<sup>701</sup>



NZIE Coat of Arms, adopted 1969.



Examples of NZIE and IPENZ logos/branding, 1940–2005.

## PUBLICATIONS AND BRANDING

The early 21st century has seen much change in IPENZ's brands and communications.

*New Zealand Engineering* dropped to bi-monthly in September 1999 but more significantly – after 54 years – was renamed *e.nz magazine* in March 2000. The new name, pronounced “ee dot nz”, was suggested by Board member John Webster (b.1943). “The ‘e’ could stand for ‘engineering’, ‘ethics’, ‘environment’ or ‘electronic,’” editor Peter King said. “The object of changing the name was to convey something of the ubiquity of engineers in our society and their connection with the modern and the dynamic.”<sup>702</sup> The Institution had earlier refreshed its brand, stylising the “e” in “ipeNZ” (closely resembling a mozzie coil) and also using it in the Institution's logo.

In 2002, the Board agreed to an explanatory byline of “Engineers New Zealand” to appear alongside the existing IPENZ logo. Unlike Engineers Australia, the Board stopped short of using Engineers New Zealand as a trading name. Instead, the goal was to capture the words without losing the IPENZ brand value.

The current “cross-hairs” logo was developed in 2006. Having reached the 9,000-member mark in 2005, this logo perhaps showed IPENZ targeting the 10,000-mark (which it did, sustainably, in 2007). Membership reached 13,900 in 2013, a giant leap from under 100 members a century earlier.

*e.nz magazine* was joined by the printed monthly *Engineering Dimension* in February 2002 on alternating months. It allowed more detail and timeliness for news than could the bi-monthly *e.nz magazine*. With a new editor, Juliet Palmer (b.1958), *e.nz magazine* was renamed *Engineering Insight* in January 2011.

Electronic publishing joined the printed stable in the 1990s, with a web presence created in 1995. The logic was that a page of *New Zealand Engineering* cost \$300 to print and was read by about 7,500 readers, whereas an internet page cost 0.4 cents and was open to about 25 million readers. IPENZ contracted ICONZ (the Internet Company of New Zealand) to get members surfing, with services including file transfer, a home page and three news groups. A weekly email newsletter *eZine* had started in the late 1990s. By 2000, 5,000 members received the electronic newsletter every Friday.<sup>703</sup> It was renamed *Engineering Direct* in 2002 and was joined by a student edition. In internet usage, 1999–2000 President Ronald Carter (b.1935) called IPENZ “one of the leading engineering institutions” – and it probably was.<sup>704</sup>

When controversial views have been aired in IPENZ policy papers, such as on mining, some members felt there was no way for them to voice contrary views. One or two resigned in protest, or took the matter to ESocR.<sup>705</sup> But being so large, the IPENZ membership will always have a very wide spectrum of views. The digital revolution has enabled greater democracy within the membership (who are regularly polled on major issues and vote for Board members electronically).

Despite the flourishing methods of communication, the field of engineering had grown so wide as to defeat one of the Institution’s long-held axioms. The Board admitted in 1999 that, “with a few exceptions, IPENZ cannot, in a rapidly globalising world, provide technical information to every discipline of engineer in IPENZ’s diverse membership.”<sup>706</sup> This allowed the journals to lose weight and focus on engineering principles, local successes and membership issues (such as ethics and continuing professional development), while sampling the best technological morsels (such as the iPad, segway, nanobots and laminated veneer lumber).

## PREMISES: THE NORTHERN REGIONAL OFFICE AND NATIONAL OFFICE

On the basis that half the membership lived in the upper North Island, a Northern Regional Office was established at 72 Dominion Road in Mount Albert in 1997. From there, John Pringle and later Lesley Cutting extended the administrative assistance of National Office (the Auckland Branch also opened an office in 2001).

National Office itself worked mortgage-free from its own floors in Molesworth House. The risk, however, of tying up so much wealth in property led to the cash crisis of the late 1990s. IPENZ had owned four floors since 1966, which after 30 years were looking “jaded”.<sup>707</sup> Two floors were let but a tenant, the South African Embassy, quit the second floor in a hurry. Rather than re-let the space again, IPENZ used it to store papers and printed matter. Years



*IPENZ offices at 158 The Terrace, Wellington, December 2013.  
IPENZ Collection.*

later, the accumulated piles of paper took eight skips to clear. “We just chucked stuff out the window.”<sup>708</sup>

The empty floors and cash crisis led to a re-focusing on IPENZ’s core business – which did not include being a landlord. Therefore, the Board sold two floors in 2000 at a loss. Two years later the rest of the Molesworth House holdings followed. The Board leased the space back from the new owners until March 2005, during which time it looked for new accommodation. The Northern Regional Office was also closed at the same time.<sup>709</sup>

In March 2005, the office moved to leased premises at 158 The Terrace (its third address on The Terrace). The building had gone up in 1981 for a marketing board (which explains the ram’s head and ring-bolt symbolism on the exterior). Signs seen from the motorway announced Engineers New Zealand (a trading name) and Futureintech, a new schools programme.<sup>710</sup> Being of comparatively recent construction, though, did not obviate the need for earthquake re-strengthening work during the summer of 2012/2013.

At the time of writing, IPENZ National Office is searching for a new office to base itself as it launches into its second century.

### **FUTUREINTECH TO NATIONAL AWARDS: FOSTERING THE ENGINEERING PIPELINE**

Another major step forward for IPENZ in the 2000s was in the field of engineering education. This is seen, appropriately, as a pipeline. Once inside the pipeline people are relatively well catered for, but getting potential young engineers to enter it was key to the future vibrancy of the profession. The way to attract younger engineers was to keep a focus on technology throughout their education. This meant influencing school leavers before they began tertiary study. The role of helping shape career ideas was given to Angela Christie, as Director – Schools. At about the same time the Government’s new Crown entity, New Zealand Trade and Enterprise, was looking for an agency to increase numbers coming through schools into technology.<sup>711</sup>

“They approached us,” Cleland says. “IPENZ looks like the right organisation and they offered us the money. The funny thing was they asked us to bid for a four-year contract, and we bid for \$700,000 in the first year and \$1.4 million each in the three following years, with the idea in the first year of getting up to speed.” IPENZ was the only contender but got a surprise – “they gave us \$1.4 million in the first year as well. We had under-bid...”<sup>712</sup> The Futureintech programme followed, and has been so successful its four-year contract has been renewed twice.<sup>713</sup>

Futureintech goes into schools and provides them and students with information on careers, training opportunities, financial support and likely employers in engineering, technology or science fields. It employed nine facilitators by 2008 and hundreds of ambassadors. An associated Neighbourhood Engineers Award was set up, sponsored by Transpower.

Another contract followed from the Ministry of Education in 2005 to provide resources for teachers of technology and others. IPENZ built on the existing Techlink website.<sup>714</sup> In 2006, the Tertiary Education Commission contracted IPENZ to work on upskilling qualifications in the information, communications and technologies sector.<sup>715</sup>

At the other end of the pipeline are engineers at the top of their game. IPENZ’s own internal awards continued to recognise the high achievers but something bigger was required. For several years IPENZ gave project awards in several categories, initially sponsored by Tranz Rail.<sup>716</sup> The New Zealand Engineering Excellence Awards were created and first issued in 2005. For these awards IPENZ partnered with other organisations, including INGENIUM, the Centre for Advanced Engineering and the Electrical Engineers Association of New Zealand.<sup>717</sup> The 2013 awards were the 10th event, which involved six other partners.

## **REPILING BENEVOLENCE: THE IPENZ FOUNDATION**

Social welfare had long removed the need for the Benevolent Society, but it staggered on into the new millennium. The criteria for making payments were very narrow (recipients had to be in “distressed circumstances”) and changing them was very difficult. So it was believed that the best way forward was to create a new charitable trust, the IPENZ Foundation, which the Board approved while on a planning retreat in 2001.<sup>718</sup> John Gardiner (b.1958) had this idea, roped Cleland in, and they then got Board support. “He and I put up the \$50 each and were the settlors,” Cleland recalls. “We consulted the Board but it wasn’t a Board decision. We just went and did it, personally.”<sup>719</sup> The Foundation first met in June 2002.

Disestablishing the Benevolent Fund was not so easy. The rule for its dissolution, requiring written consent from 75 per cent of members, had been set when membership was at 5,000 – now it was over 8,000. A year elapsed before the figure was reached, by which time another 1,000 members had joined; inertia and apathy were blamed for the slow response. The Benevolent Fund was dissolved on 27 April 2005.<sup>720</sup>

The IPENZ Foundation was registered as a charitable trust in April 2005, after which the \$460,000 Benevolent Fund was transferred to it. New bequests, prudent investment and the transfer of branch funds have increased it to over \$800,000.<sup>721</sup> The Foundation has much wider scope than the former Benevolent Society. It is primarily to raise the profile of engineering by offering tertiary scholarships and supporting IPENZ awards and heritage activities, with the benevolence function riding its coat-tails.

The IPENZ Board appoints trustees, and a pattern has emerged of past Presidents moving on to Chair the Foundation.

## **GOING INTERNATIONAL: ACCORDS, AGREEMENTS AND LEADERSHIP**

Being an island nation and society built on migration, New Zealanders are among the most travelled professionals in the world. Engineers benefit by overseas experience, so getting international recognition for New Zealand qualifications and competency quality marks is vital. In earlier decades, the chartered United Kingdom institutions provided international commonality, and New Zealand engineers were regular attendees at Commonwealth and regional engineering gatherings. New Zealand has since nationalised its qualifications, requiring new agreements on their international acceptability. New Zealand has played a leading role in six agreements, which in 2007 accreted into an International Engineering Alliance.

IPENZ was a founding signatory to the first agreement, the Washington Accord in 1989, with President Meyer signing. This gave New Zealand five international partners (later increased to 14). They recognise New Zealand’s process that generates four-year Bachelor of Engineering degrees (and vice versa). It also recognises a country’s accreditation programmes

## AN EVOLVING ORDER

and engineering education standards. This gives travelling members “real benefits”, such as claiming equivalence when dealing with employers overseas.<sup>722</sup>

The Institution’s motive for participating in this Accord was “to achieve international benchmarking of our educational and competence standards but also to help our engineers mobilise their competence around the world. For this reason we have put a fair amount of work into the activity since 2000.”<sup>723</sup>

A Sydney Accord followed in 2001, relating to Engineering Technologists with the three-year Bachelor of Engineering Technology and similar degrees.<sup>724</sup>

Since 2002, the Dublin Accord has recognised two-year diplomas for Engineering Technicians. IPENZ had not signed this, instead having provisional status since 2006 because of the fluidity in the New Zealand education sector over diploma qualifications.<sup>725</sup> However, New Zealand gained signatory status in 2013.

These Accords soon aligned the two-yearly meetings of the signatories, and are periodically reviewed. The meetings rotated around member countries and in 2003 they were scheduled for Hong Kong. The SARS scare ruled Hong Kong out so – at very short notice – IPENZ agreed to host that International Engineers meeting, which ran successfully in Rotorua. Delegations to these meetings were led usually by the Chief Executive but since 2004 have included Basil Wakelin. The meetings are not executive, so issues are brought back for member organisations to adjudicate. These Accords allow member organisations to align their measures of competency, compare standards and adopt global models.<sup>726</sup>

New Zealand is party to other agreements on engineer mobility. The APEC Engineer Agreement (New Zealand signed in 2000) and Engineers Mobility Forum (1997, later renamed International Professional Engineers Agreement (IPEA) for non-Asia/Pacific countries) are very similar. They provide mobility agreements among many nations (including Russia and Indonesia). The aim is to minimise obstacles for an engineer wishing to be accredited (registered/chartered) in a signatory nation, by listing them on an international register as an IntPE. It is a benefit when travellers want to quickly market their credentials. Wakelin has been Chair of the IPEA since 2009. Getting agreement on cross-border recognition of the profession and a schedule of benefits was “extremely contentious, very difficult to administer,” Wakelin says, so he is encouraging the IPEA to refocus as a standards-setting body. Wakelin has also mentored some countries wishing to join and has been on the review panel for others, which is a significant role.<sup>727</sup>

A similar mobility agreement (the sixth) is for Engineering Technologists, with New Zealand so far the only nation with an online technologist register.<sup>728</sup>

IPENZ provides leadership for the entire International Engineering Alliance in several areas. When the first non-English-speaking nation joined the Washington Accord, a new way of defining education and competence standards was required. Cleland was determined at the 2001 meeting in South Africa that New Zealand would be involved in this, already being

committed through the new CPEng legislation to an outcomes-based competence standard (rather than by definition of role). A small group worked through their meal breaks and came up with a distinction based on the complexity of engineering problems and the ability of engineers with longer qualifications to tackle more complex problems. Three graduate profiles were drafted, based on three descriptors for the engineering problems.

Back in New Zealand, it went before the IPENZ Professional Standards Board (soon renamed the Standards and Accreditation Board, also then chaired by Wakelin), as a working draft, at its first meeting in February 2002. Over the year IPENZ further developed the concept into professional engineer competency standards (as required for CPEng registration). These had competency profiles for Engineering Professionals, Technologists and Technicians, as well as three graduate profiles. These six profiles were taken to the International Engineering meeting, which in 2003 showed “warm support” for the concept. In 2004 they used them as the starting point for developing internationally recognised profiles as exemplars of the standard, not the standard itself – a shrewd move. This development work in the 2000s “still sits as the basis for the exemplars (de facto standards) of the six agreements... a significant achievement”.<sup>729</sup>

At an administrative level, IPENZ has been instrumental in unifying rules and procedures, and creating a secretariat. Initially, member nations volunteered for two-year stints providing the secretariat and then two years chairing meetings. After 2003, when all six agreements met at combined international meetings, IPENZ realised New Zealand would be neither big nor wealthy enough to provide the secretariat. Cleland first offered to host the website, which maintained the international registers for IntPE and others. In 2003, he suggested a permanent paid secretariat. Member nations would fund it through a *pro rata* formula, allowing the role to be contracted out. This was agreed to in 2006 at the Dublin meeting, by all six agreements, and New Zealand bid for the inaugural four-year contract. John Webster, outgoing IPENZ President (and former Chief Executive of IEAust) helped set this up, and New Zealand has been the secretariat ever since, earning “a high reputation for what it has done”.<sup>730</sup>

New Zealand still chairs the governing group on International Engineering Agreements. In the role, Wakelin covers 26 countries, a mini-United Nations, and shows why he is a Distinguished Fellow of IPENZ. “We punch well above our weight at these meetings, and we operate at the leading edge of international best practice, particularly in the area of outcomes-based competence assessment.”<sup>731</sup>

## CANTERBURY EARTHQUAKES RESPONSE

By the time of the Canterbury earthquakes of 2010 and 2011, IPENZ was a respected elder statesman of professional organisations. It had had its “Arab Spring”, reforming itself into an efficient body appropriate to current times.

The Canterbury earthquakes focused much attention on the engineering profession. After the Royal Commission started hearings in April 2011, IPENZ was commissioned to report on standards and regulations in building contracting, but also made a submission. Cleland and Deputy Chief Executive Nicki Crauford sat on panel discussions, and after the Royal Commission published its report in December 2012, the Minister of Building and Construction sought comment on it from IPENZ as well as his own officials.<sup>732</sup>

Despite the large loss of life and considerable destruction of buildings, the engineering profession was not made a scapegoat. Many engineers gave evidence on their input into buildings which had failed, and some were reduced to tears.

There were questions about the professional affiliations of an engineer with fraudulently-acquired qualifications who was linked to the collapsed CTV Building (in which 115 people died), but Gerald Shirtcliff has never been a member of IPENZ.<sup>733</sup> Where it can the Institution has been taking steps in regard to IPENZ members involved in the design and approval of the project.

When there were issues with engineers during the rebuild, IPENZ was the go-to organisation. After complaints about an engineer involved in house damage assessments were rejected by the Canterbury Earthquake Recovery Authority and Earthquake Commission, the local Member of Parliament Ruth Dyson (b.1957) said she would refer it to IPENZ – “they’ll take it seriously”.<sup>734</sup>

## ENDNOTES

- 672 Cleland interview. *AR* 2000, 6. *e.nz* 1:4 (September/October 2000), 47. A Massey food technology lecturer for 22 years, his global experience was with the International Union of Food Science and Technology and International Institute of Refrigeration.
- 673 For instance see ‘Repeal?’ *NZE* 45:9 (October 1990), 43. ‘ERB relationship under review’, *NZE* 41:5 (June 1986), 33.
- 674 *e.nz* 1:3 (July/August 2000), 10.
- 675 *e.nz* 1:2 (May/June 2000), 41.
- 676 *NZE* 53:2 (March 1997), 28.
- 677 Nick Smith interview with author, 12 June 2012.
- 678 *e.nz* 1:3 (July/August 2000), 10.
- 679 *Ibid.*
- 680 *Ibid.*
- 681 *Ibid.*
- 682 Smith interview. It was drawn on 11 May 2000, the fourth ballot of the year. Even if the Bill had not been drawn, the Labour/ Alliance Government was prepared to rearrange its legislative programme to include Smith’s bill. Pete Hodgson, *NZPD* 584 (24 May 2000), 2545. First reading was on 24 May 2000.
- 683 *ED* 5 (June 2002), 1. The Government’s Supplementary Order Paper 123 introduced the ‘broad regulatory model of certification’ and added additional mechanisms for appeal. David Cunliffe, *NZPD* 601 (29 May 2002), 16669.
- 684 *ED* 5 (June 2002), 1.
- 685 Cleland notes, 2.
- 686 Nick Smith, *NZPD* 600 (15 May 2002), 16214.
- 687 Cleland notes.
- 688 ‘Report of the Ministerial Inquiry into the Under-Reporting of Cervical Smear Abnormalities in the Gisborne Region’ (p.150), released 10 April 2001, said, S5.190, there were ‘no compulsory requirements for medical practitioners to undertake formal continuing education, or for them to have their competence reassessed’.
- 689 Cleland interview. Sec 41 in the CPEng Act 2002 establishes minimum standards for competency and minimum standards for demonstrating current competency. ‘I wrote this in such a way that we had to make the rules up for this, and putting in the word ‘demonstrate’ gave me a whole lot of flexibility...’

- 690 Cleland interview. Second reading was 27 March and 15 May 2002. Third reading 29 May 2002, *NZPD* 601 (29 May 2002), 16666, 16700. The New Zealand Nuclear Free Zone Extension Bill was on its second reading but was negated in a division 108-7. Another bill discussed that night was the Foreign Fishing Crew Wages and Repatriation Bond Bill, second reading.
- 691 Smith interview. Rumours of an early election were rife by then and were published on 30 May 2002 by *Dominion*, 1, as a result of Smith's tactics in the House the previous night. But the Prime Minister, more interested in the Samoan apology and 'painter-gate', did not confirm a date until 12 June. *Dominion*, 12 June 2002, 1.
- 692 *ED* 5 (June 2002), 2.
- 693 Cleland interview.
- 694 Seven of the first nine CPEC appointees were MIPENZ or FIPENZ. *New Zealand Gazette* (29 May 2003), 1592.
- 695 *ED* 10 (November 2002), 1.
- 696 *ED* 22 (December 2003), 7. Young Engineers New Zealand (rendered yENZ) became a Technical Group in 2003. *AR* 2004, 37.
- 697 *AR* 2003, 6.
- 698 *ED* 72 (July 2008), 1.
- 699 John Edgar interview with author, 5 February 2013.
- 700 *ED* 49 (June 2006), 3.
- 701 Cleland interview.
- 702 Peter King editorial, *e.nz* 1:1 (March 2000), 2.
- 703 'IPENZ Wired! Get Surfing', *NZE* 50:2 (March 1995), 32. *NZE* 51:11 (December 1996), 2. *AR* 1998, 9. *AR* 2000, 1.
- 704 *AR* 1999, 4.
- 705 Kate Zwartz interview with author, 29 January 2103. 'Tui Mine,' *Engineering Insight* 13:1 (January/February 2012), 24.
- 706 Peter King editorial introducing *e.nz*. *NZE* 54:9 (January/February 2000), 2.
- 707 *AR* 1999, 4.
- 708 Bishop interview.
- 709 *ED* 28 (July 2004), 1. *AR* 1999, 4. *AR* 2000, 6. *AR* 2003, 7.
- 710 *ED* 37 (May 2005), 2.
- 711 New Zealand Trade and Enterprise was established as a Crown Entity in 2003, formed from a merger of Trade New Zealand and Industry New Zealand.
- 712 Cleland interview. *ED* 21 (November 2003), 4. The \$5.6 million contract was the largest in IPENZ history. *AR* 2003, 7.
- 713 *ED* 98 (November 2010), 5.
- 714 *ED* 65 (November 2007), 7. *e.nz* 11:1 (January/February 2010), 31.
- 715 *AR* 2006, 7.
- 716 *e.nz* 1:3 (July/August 2000), 13; 1:2 (May/June 2001).
- 717 *ED* 37 (May 2005), 3.
- 718 *ED* 12 (February 2003), 4.
- 719 Cleland interview.
- 720 *IPENZ Foundation Newsletter* 1 (September 2004), 2; 2 (June 2005), 2.
- 721 It was over \$650,000 in 2006 before the branch funds were transferred in 2007. *IPENZ Foundation Newsletter* 3 (December 2006), 2. Susie McCutcheon interview with author, 29 January 2013. Cleland notes.
- 722 Quote from Cleland notes. 'Happenings in International Mobility', *ED* 34 (February 2005), 6. Initial partners were Australia, Canada, Ireland, United Kingdom and United States of America, to which later were added Hong Kong China, Japan, Korea, Malaysia, Singapore, South Africa, Taiwan and Turkey. Another six nations have provisional status. 'The Washington Accord Past, Present, Future', IEA, 2011, [www.ieagreemements.org](http://www.ieagreemements.org) (accessed 9 January 2013).
- 723 Cleland notes.
- 724 Eight Washington Accord nations have signed this, including New Zealand, Australia, Canada, Hong Kong China, Ireland, South Africa, the United Kingdom and United States of America, plus two with provisional status.
- 725 Canada, Ireland, South Africa and the United Kingdom are signatories, with Australia, Korea and the United States of America joining New Zealand as provisional members.
- 726 *AR* 2003, 7; *ED* 28 (July 2004), 2.
- 727 Wakelin interview.
- 728 International Engineering Alliance website, [www.ieagreemements.org](http://www.ieagreemements.org) (accessed 9 January 2013).
- 729 Cleland notes.
- 730 *Ibid.*
- 731 Cleland in *AR* 2003, 7.
- 732 *Dominion Post*, 12 December 2012, A10.
- 733 *Dominion Post*, 15 September 2012, C2.
- 734 Ruth Dyson interviewed on TV One, 24 December 2012.



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# CONCLUSION

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The Institution of Professional Engineers New Zealand has been perennially successful for its members, numbers of which have increased virtually every year. For over a century, it has given public sector engineers a chance to voice concerns that might not have been appropriate in their professional capacity. It brought professional respect to private sector engineers – and kept everyone technically up to date.

In its early years, the Institution was less successful as a political lobbyist. The issue that caused its birth, responsible expenditure on public works, was not achieved for many decades. This, perhaps, can be put down to the one-year presidency – described as “brief and inadequate and limited”<sup>735</sup>

It also took six decades to arrive at its current mature identity. Before that, like a teen lacking confidence, it fretted over its name, whether it was *Ingenieur* or *ingénue* – and whether it represented engineers or engineering.

The Institution found success in networking with other sectors and bodies. It learnt to communicate. Its technical groups have stimulated advances in many areas, and its relationships with other engineering organisations have been collegial (despite the representation of the “middle group” still being very fluid). Internationally, New Zealand can be proud of IPENZ’s achievements.

The Secretaries and later Chief Executives have over the years been strong personalities. They have variously been described as alpha males, aged or authoritarian, and either in the role for too long or treating it as a retirement posting. Many served at least 15 years and imbued the office with their personality (a Dutch-auction of spirit bottles followed one departure). If sensible, they amended their ways to get on with the office staff, Board members and engineers around them.

An indication of how things have changed over the Institution’s 100 years is a staff meeting today, where the ninth Chief Executive interacts sensitively with a room full largely of female staff, talking about the emotional component in communication. For William

## AN EVOLVING ORDER

Ferguson, glancing down from his manorial portrait in his namesake meeting room, this would probably be very much outside his comfort zone.

Engineering a modern economy out of the comparatively untouched landscape was so fundamental to the establishment of the nation of New Zealand that very many interests were involved (political, economic, emotional and racial). In a sense, engineering a modern society and economy was too big a job to leave just to the engineers: everyone had a stake.

But in managing the stakes and stakeholders, IPENZ has on the whole been very successful. Its approach has rightly been principled – as per a recent comment: IPENZ “sets standards, not fees”<sup>736</sup>

## ENDNOTES

735 Eric Hitchcock to Rowntree, 14 November 1940. Minute Book 1940-1941.

736 Cameron Smart interview with the author 13 April 2012, reported from a weblog about the Christchurch rebuild, February 2012.

## APPENDIX 1

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# PERSONNEL

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### **PRESIDENTS**

- March 1914 Richard Septimus Rounthwaite (1854–1932)  
June 1914–17 Robert West Holmes (1856–1936)  
1917–18 John Blair Mason (1858–1927)  
1918–19 Sydney Arthur Robert Mair (1872–1961)  
1919–20 William Ferguson (1852–1935)  
1921–21 Cyrus John Richard Williams (1862–1942)  
1921–22 Francis William MacLean (1858–1951)  
1922–23 Ashley John Hunter (1854–1932)  
1923–24 Frederick William Furkert (1876–1949)  
1924–25 Arthur Dudley Dobson (1841–1934)  
1925–26 Frederick James Jones (1874–1943)  
1926–27 Walter Ernest Bush (1875–1950)  
1927–28 Charles John McKenzie (1878–1942)  
1928–29 Frank Ernest de Guerrier (1873–1956)  
1929–30 Joseph George Alexander (1873?–1954)  
1930–31 George Thomas Murray (1859–1947)  
1931–32 David Kerr Blair (1868–1944)  
1932–33 Frederick Templeton Mannheim Kissel (1881–1962)  
1933–34 Frederick Joseph Williams (1876–1944)  
1934–35 Drummond Holderness (1887–1946)  
1935–36 Hugh Vickerman (1880–1960)  
1936–37 John Ernest Lelliot Cull (1879–1943)  
1937–38 James McGregor Wilkie (1879–1947)  
1938–39 Samuel Irwin Crookes (1871–1955)  
1939–40 Alfred James Baker (1881–1943)  
1940–41 Edward Hitchcock (1883–1966)  
1941–42 Matthew Cochrane Henderson (1872?–1962)

## AN EVOLVING ORDER

- 1942–43 Alfred Onslow Glasse (1889–1977)  
1943–44 John Gill Lancaster (1883–1950)  
1944–45 Francis Malcolm Corkill (1892–1970)  
1945–45 William Langston Newnham (1888–1974)  
1946–47 Robert Archibald Campbell (1881–1955)  
1947–48 Leslie Bertram Hutton (1889–1972)  
1948–49 Arthur James Dickson (1904–1973)  
1949–50 Horace Campbell Lusty (1895–1972)  
1950–October 1950 Spencer Gray Scoular (1896–1950)  
1951–52 Fritz Langbein (1891–1967)  
1952–53 Percy Roy Angus (1893–1961)  
1953–54 Neville Longbourne Vickerman (1893–1978)  
1954–55 Richard Stanley Maunder (1890–1974)  
1955–56 Frederick Melrose Horowhenua Hanson (1895–1979)  
1956–57 Donald Stuart Gore Marchbanks (1901–1987)  
1957–58 John Cossar Forsyth (1890–1960)  
1958–59 Walter Gordon Morrison (1903–1983)  
1959–60 Arnold Fielder Downer (1895–1984)  
1960–61 Charles Idrys Kidson (1898–1962)  
1961–62 Hubert Reynolds Bach (1904–1995)  
1962–63 Percy Lyndon Laing (1909–1979)  
1963–64 Eoin Robert Garden (1903–1997)  
1964–65 Grant Raglan Milne (1904–1994)  
1965–66 John Burgess Rowntree (1906–1986)  
1966–67 Henry James Hopkins (1912–1986)  
1967–68 Frederick Dudley Tonkin (1901–1991)  
1968–69 Bruce William Spooner (1911–1982)  
1969–70 John Charles North (1914–1979)  
1970–71 George K Armstrong (1915–1982)  
1971–72 Ronald Arthur Joseph Smith (1909–1992)  
1972–73 Kenneth Christie (1918–2000)  
1973–74 Edwin William de Lisle (1917–1987)  
1974–75 Archibald Gordon Bogle (1914–2005)  
1975–76 George Fraser Bridges (b.1914)  
1976–77 John Henderson Ingram (b.1924)  
1977–78 Peter Gray Scoular (1924–1983)  
1978–79 Philip William Blakeley (1915–1994)  
1979–80 David Alan Thom (b.1924)  
1980–81 Alister Miles Kennedy (b.1927)  
1981–82 Robert George Norman (b.1923)  
1982–83 Raymond Francis Meyer (b.1931)  
1983–84 Eric Ross Ireland (1926–2005)  
1984–85 Alexander Gordon Stirrat (1924–2000)  
1985–86 Murray Mayell Sweetman (1929–1993)  
1986–87 Derek Cooper Rose (1922–2002)

1987–88 James Harold Vernon (b.1927)  
 1988–89 Richard Laurence Earle (b.1930)  
 1989–90 Douglas Stewart Ritchie (b.1932)  
 1990–91 Barry John Butcher (b.1930)  
 1991–92 Alan Norman Bickers (b.1945)  
 1992–93 Robert John Aspden (b.1938)  
 1993–94 Robert Browne Wilkinson (b.1939)\*  
 1994–95 Graeme James Robertson (b.1945)\*  
 1995–96 Douglas Keith Armstrong (b.1942)\*  
 1996–97 Arthur Francis Small (b.1946)\*  
 1997–98 John Philip Blakeley (b.1940)\*  
 1998–99 Ruth Gretchen Kivell (b.1948)\*  
 1999–2000 Ronald Powell Carter (b.1935)\*  
 2000–01 John Anthony Gibson (b.1942)\*  
 2001–02 John William Cunningham (b.1950)\*  
 2002–03 John Alexander Webster (b.1943)\*  
 2003–04 Gerry Lynn Te Kapa Coates (b.1941)\*  
 2004–05 Ian Murray Parton (b.1945)\*  
 2005–06 Roland Bert Frost (b.1949)\*  
 2006–07 Peter Swiftsure Jackson (b.1947)\*  
 2007–08 Jeffrey Alexander Jones (b.1946)\*  
 2008–09 Basil V Walker (b.1943)\*  
 2009–10 Anthony Edwin Wilson (b.1955)\*  
 2010–11 Garry John Macdonald (b.1953)\*  
 2011–12 Stephen Reindler (b.1953)\*  
 2012–13 Graham Brockway Darlow (b.1954)\*  
 2013–14 Derrick Raymond Adams (b.1956)\*  
 2014–15 Kevin Joseph Thompson (b.1950)\*

\* Deputy President the year preceding becoming President, the exception being Robert Wilkinson who was Deputy President from 1991 to 1993.

## SECRETARIES

1914–29 Richard Septimus Rounthwaite (1854–1932)  
 1929–44 Harold Linter Cole (1880?–1953)  
 1944–64 Douglas Laurence Bedingfield (1903–1969)  
 1964–76 Reginald William Kennedy Stevens (1905–1984)  
 1976–91 Anthony John Bartlett (1929–2009)

## DEPUTY SECRETARIES

1959–60 JV Kean [Executive Secretary]  
 1960–83 James Graeme Porteous (1919–2008)  
 1983–87 Arthur W Fitchett

## ASSISTANT SECRETARIES (AND SECRETARY TO ERB)

1968–76 Anthony John Bartlett (1929–2009)  
1976–83 Anthony W Fitchett  
1983–85 Mike J Smith  
1985–86 WF King  
1986–87 John Eade

## EXECUTIVE DIRECTOR/CHIEF EXECUTIVES

1991–96 Armour Mitchell (1939–2005)  
1997–2000 Warwick Thomas Bishop (b.1941)  
2000–present Andrew Cleland (b.1955)

## DEPUTY CHIEF EXECUTIVES

1987–? WF King  
2000–04 John Gardiner (b.1958)  
2010–present Nicki Crauford

## HONORARY FELLOWS

1947 Percy Dunsheath (1886–1979)  
1949 Reginald Edward Stradling (1891–1952)  
1962 Lord Cobham, Sir Charles John Lyttelton (1909–1977)  
1965 William Hayward Pickering (1910–2004)  
1981 Cecil Marin Segedin (1915–2002)  
1985 Roy Douglas Northey (1924–2011)  
1990 Prince Philip, Duke of Edinburgh (b.1921)  
1993 Mary Earle (b.1929)  
1995 John Britten (1950–1995)  
1995 Thomas William Schnackenberg (b.1945)  
1996 Edmond Hillary (1919–2008)  
1997 Angus Tait (1919–2007)  
1998 Graham William Batts (b.1937)  
1999 Colin James Maiden (b.1933)  
2000 Geoffrey Thornton (b.1922)  
2001 Kenneth Andrew McIntosh (1930–2011)  
2001 Geoffrey Page (d.2006)  
2002 Bill Buckley (b.1945)  
2002 Gary Paykel (b.1948)  
2003 John Hood (b.1952)  
2003 Russell Peter Smith (1944–2005)  
2005 Peter Maire  
2006 Henry van der Heyden  
2007 Graeme Davies  
2007 Jeffrey L Tallon (b.1948)  
2008 Murray G Sturgeon

- 2009 Denford C McDonald  
 2009 David Middleton (b.1947)  
 2010 Paul Terence Callaghan (d.2012)  
 2010 Peter Hunter  
 2010 Kenneth Stevens (b.1944)  
 2012 Brent Robinson (b.1959)  
 2013 Geoffrey Mark Shaw (b.1961)

## **DISTINGUISHED FELLOWS**

- 1996 Eoin Robert Garden (1903–1997)  
 1996 David Alan Thom (b.1924)  
 1997 Ronald Powell Carter (b.1935)  
 1997 John Henderson Ingram (b.1924)  
 1997 Robert George Norman (b.1923)  
 1997 John Cameron Rutledge (1941–2009)  
 1998 Neville Jordan (b.1943)  
 1998 Robert Park (1933–2004)  
 1998 Thomas Paulay (1923–2009)  
 1999 Cyril Wilfred Firth (1904–2003)  
 1999 Hugh Alexander Fullarton (1908–2004)  
 1999 Peter Francis Menzies (b.1937)  
 1999 Raymond Francis Meyer (b.1931)  
 2000 Douglas Keith Armstrong (b.1942)  
 2000 Robert John Aspden (b.1938)  
 2000 Steven Caverhill Gentry (b.1933)  
 2000 Arthur Francis Small (b.1946)  
 2000 Jack Lionel Woodward (b.1926)  
 2001 John Talbot Boys (b.1940)  
 2001 David George Elms (b.1934)  
 2001 Alister Miles Kennedy (b.1927)  
 2002 Clifford Raymond Barnett (1929–2008)  
 2002 Alan Norman Bickers (b.1945)  
 2002 Ian Murray Parton (b.1945)  
 2002 William Henry Robinson (1938–2011)  
 2003 Leslie Gavin Cormack (b.1940)  
 2003 Richard Laurence Earle (b.1930)  
 2003 Basil V Walker (b.1943)  
 2003 Robert Browne Wilkinson (b.1939)  
 2004 Richard John Bentley (b.1948)  
 2004 Archibald Gordon Bogle (1914–2005)  
 2004 Mita Robert Henare (1932–2008)  
 2004 Robin Kingston (b.1926)  
 2005 Neville Bertram Beach (1931–2010)  
 2005 John Philip Blakeley (b.1940)  
 2005 Norman David Hardie (b.1924)

## AN EVOLVING ORDER

- 2005 Ruth Gretchen Kivell (b.1948)
- 2006 Bryan Allen Bartley (b.1928)
- 2006 Roger Brian Keey (b.1934)
- 2006 Graeme James Robertson (b.1945)
- 2006 Roy Martin Sharp (b.1946)
- 2007 Roger William George Blakeley (b.1945)
- 2007 Robin James Dunlop (b.1946)
- 2007 Ian Alexander Nicholson Fraser (b.1945)
- 2007 Richard Deane Sharpe (b.1948)
- 2007 Basil John Wakelin (b.1941)
- 2008 Richard Hammond Aitken (b.1945)
- 2008 Barry John Butcher (b.1930)
- 2008 Keith Sharman Turner (b.1950)
- 2009 Lindsay Cecil Crossen (b.1950)
- 2009 Peter Swiftsure Jackson (b.1947)
- 2009 Kevin Joseph Thompson (b.1950)
- 2010 Debes Bhattacharyya (b.1947)
- 2010 Murray Douglas Gillon (b.1945)
- 2010 Martin Douglas Heffernan (b.1953)
- 2011 Andrew Hamilton Buchanan (b.1948)
- 2011 Robert Ian Fyfe (b.1961)
- 2011 Geoffrey Stewart Hunt (b.1951)
- 2011 Bruce William Melville (b.1949)
- 2012 William Murray Gallagher (b.1941)
- 2012 Giuseppe Grilli (b.1936)
- 2013 David Ronald Brunson (b.1959)
- 2013 Michael John Nigel Priestley (b.1943)
- 2013 John Kenneth Raine (b.1947)
- 2013 Adam William Thornton (b.1952)

## APPENDIX 2

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# AWARDS

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### ANGUS AWARD

This award was endowed by Percy Roy Angus (1893–1961), a former Chief Mechanical Engineer of the New Zealand Railways, and a former President of the Institution. The award was for the best paper by an NZIE/IPENZ member or members on a mechanical engineering topic.

- 1959 JH Smith, “Production and Utilisation of Geothermal Steam”
- 1960 RS Bolton, “Metal Arc Welding of Mild Steel Plate”
- 1961 Geoffrey V Burgoyne, “Handling of Bitumen in Bulk”
- 1962 PC Spearman, “High-head Sluice Gates and Operating Machinery at Hawea Lake Control Works”
- 1963 LO Hunter, “General Review of Building Services”
- 1964 MA Mattingley, “Air Conditioning in New Zealand”
- 1965 RM Lockhart, “Problems of Aircraft Refuelling”
- 1966 Jack Warwick Francis Welch, “The Maintenance of Diesel Engines in Passenger Service Vehicles”
- 1967 RJ Williamson, “All-weather Mechanical Package Loading of Ships at Bluff”
- 1968 GA Hutchinson, “Municipal Compost Plant, Auckland”
- 1969 W Waters, “A Review of Modern Cargo Handling Methods”
- 1970 CR James, “Second Generation Geothermal Power”
- 1971 P Potter, “Pulverised Fuel Firing of an Economic Boiler”
- 1972 EJ Barnard, “Design Criteria for Kapuni Field Facilities”
- 1973 DH Tucker, “Drying of Fibrous Webs”
- 1974 Francis Nicholls Blackwell, “Earthquake Protection for Mechanical Services in Buildings”
- 1975 Graham J Ade, Peter G Armstrong, and Arnot M McConnell, “Offshore Loading Systems Using Slurrying Techniques”
- 1976 Roger Brian Keey, “The Process of Optimisation of a Roller Conveyor Dryer”

## AN EVOLVING ORDER

- 1977 CG Martin, "The Design of Air Pollution Control Equipment"
- 1978 Geoffrey H Robinson and Richard George Whillock, "Huntly Power Station – Some Aspects of Plant Design"
- 1979 Alan Lee Titchener, "Some Recent Advances in Materials Technology"
- 1980 Harold A Trethowen, "Indoor Versus Outdoor Climate"
- 1981 SB Thorn, "Experience with LPG Fuelled Commercial Vehicles"
- 1982 Robert I Rhodes, "The Wear on Diesel-Electric Locomotives and the Development of the Heumann Tyre Profile on NZR"
- 1983 James Bruce C Taylor, "Forces Exerted by Parallel-axled Railway Vehicles on Sharp Curves"
- 1984 Francis Nicchols Blackwell, "Energy Conservation in Commercial Buildings"
- 1985 Harold A Trethowen, "Controlled Climate Chambers for Building Research"
- 1986 William Douglas Stuart Brander and G Baird, "Monitoring the Operation of Heating Systems using the Performance Line Method"
- 1987 CB Goh, "Design Criteria for Non-water-jacket Apparatus for Testing Gas Cylinders"
- 1988 CR Smart, "A Method for Calculating Low Cycle Fatigue Life"
- 1989 Leslie Andrew Erasmus, "Seismic Energy Dissipation with Ring Springs"
- 1990 CG Martin, "The Design of Fired Tube Heaters for Heat Transfer Fluids"
- 1991 Richard GJ Flay, "Low Air Side Pressure Loss Heat-exchanger Design for Applications such as Wind Tunnels"
- 1992 James B Randle and KC Lee, "Ohaaki Power Station Main Stream Pressure Control System and its Development"
- 1993 Geoffrey M Henderson, "The Torque Limiting Gearbox (TLG) System of Power Control: Technical and Commercial Implications for Wind Power"
- 1994 Leslie Andrew Erasmus, "Fatigue Strength of Bolts under Fluctuating Tensile Load"
- 1995 Adam William Thornton, "Relocation of the Museum Hotel"
- 1996 Kevin E Hill, "A Prototype Ring Spring Cartridge for Mitigating Transient and Seismic Inputs"
- 1997 NJ Locke, Richard GJ Flay and PS Jackson, "Design of a Wind Tunnel Traversing Rig and Application to Aerofoil Wake Measurements"
- 1998 Bryan Leyland and Graeme Jessup, "Active Draft Tube Control Gates for Increased Generation"
- 1999 John Raine and D Haywood, "Development of a Stirling-cycle Refrigerator"

## ANGUS AWARD FOR WATER, WASTE AND AMENITIES

The IPENZ Supreme Technical Awards for Engineering Achievers is presented biennially and honours Percy Roy Angus (1893–1961). This award carries on from the Infrastructure, Utilities and Transport (2004) and the Utilities and Networks Award (2005–2009).

- 2011 Geoffrey Alan Pickens (b.1940)
- 2013 John Milton Crawford (b.1964)

## COMMUNICATIONS AWARD

The IPENZ Communications Award was an annual award recognising outstanding achievement by an IPENZ member or group of members in communicating engineering and the work of engineers to the media and the public.

- 1988 Ian Walter Gunn (b.1935)
- 1990 Reginald Bruce Shephard (b.1938)
- 1991 Ruth Gretchen Kivell (b.1948) and Alan Archibald Winwood (b.1948)
- 1992 John Philip Blakeley (b.1940)
- 1993 IPENZ Taranaki Branch
- 1994 Geoffrey Henderson (b.1958)
- 1995 Robert Browne Wilkinson (b.1939)
- 2001 Bryan William Leyland (b.1936)
- 2002 Andrew Scott
- 2004 Jonnette Lesley Adams (b.1971)

## CRANKO AWARD FOR MECHANICAL AND MANUFACTURING

In 2002, the Mechanical and Manufacturing category was created as one of the IPENZ Supreme Technical Awards for Engineering Achievers, and is presented biennially. In 2005, it was renamed the Cranko Award for Mechanical and Manufacturing in honour of John Eardley Cranko (1929–1978), a consulting mechanical engineer who died in a Canterbury flying accident in late 1978.

- 2002 Clive Eric Davies (b.1949)
- 2004 Richard Downs-Honey (b.1959)
- 2006 Donald Murray Clucas (b.1963)
- 2008 Keith Vivian Alexander (b.1946)
- 2010 Ross Martin Green (b.1955)
- 2012 Debes Bhattacharyya (b.1947)

## DOBSON AWARD FOR TRANSPORTATION INFRASTRUCTURE

This award, like the former namesake NZIE/IPENZ lecture series, honours Edward Dobson (1816–1908) and his son, Sir Arthur Dudley Dobson (1841–1934). The IPENZ Supreme Technical Award for Engineering Achievers is presented biennially and carries on from the Infrastructure, Utilities and Transport Award (2004).

- 2006 Robin James Dunlop (b.1946)
- 2008 Tony Miller Porter (b.1950)
- 2010 Peter Terence McCombs (b.1943)
- 2012 Bruce William Melville (b.1949)

## ENTREPRENEURIAL AWARD

This was an annual award recognising an IPENZ member or group of members who created or developed a new business opportunity or a significant new business venture.

- 1996 John Britten (1950–1995)
- 1998 Neville Jordan (b.1943)
- 1999 Exicom Technologies
- 2000 Paul Buckrell (b.1952) and Consultel
- 2001 William Gallagher (b.1941)

## ENVIRONMENTAL AWARD

This biennial award recognised engineering projects which exemplified care and consideration of environmental values. The Environmental Award was generally awarded at the NZIE/IPENZ Annual Conference early the following year. This award was replaced by the New Zealand Engineering Excellence Awards' category award Sustainability and Clean Technology.

- 1972 Ministry of Works, Wellington Motorway from Ngauranga to Hill Street
- 1974 Ministry of Works and Development, Wairakei to Taupo Highway Deviation
- 1974 New Zealand Electricity Department, Aviemore and Benmore Projects
- 1976 Hamilton City Council, Water Pollution Control Plant
- 1978 Truebridge Callender Beach and Company, Whitby Village
- 1980 Waitemata City, Solid Waste Management Scheme
- 1982 New Zealand Railways, Mangaweka to Utiku Railway Deviation
- 1984 Ministry of Works and Development, Onehunga Bay Development
- 1986 Hawke's Bay Catchment Board and Regional Water Board, Havelock North Flood Control Scheme
- 1988 New Zealand Railways Corporation, North Island Main Trunk Railway Horopito Deviation
- 1988 New Zealand Forest Products Pulp and Paper Limited, Kinleith No.5 Recover Furnace
- 1990 Beca Carter Hollings and Ferner Limited for Levin Borough Council, the Levin Effluent Disposal Scheme
- 1992 Southland Regional Council, Invercargill's Flood Alleviation Scheme
- 1994 Tonkin & Taylor and Waste Management New Zealand Limited
- 1998 Mobil Oil
- 2000 Transit New Zealand, Beca Carter Hollings and Ferner, and McConnell Smith, Otira Viaduct
- 2002 Fulton Hogan, Ultra High Pressure Watercutter for Excess Bitumen Removal
- 2004 CH2M Beca, Fletcher Construction, Watercare Services Limited and Manukau City Council, Manukau Wastewater Treatment Plant

## EVAN PARRY AWARD

This award was endowed by former NZIE President Richard Stanley Maunder (1890–1974) in 1964 as a memorial to Evan Parry (1865–1938). Parry was an early New Zealand electrical engineer and the award recognised the best electrical engineering paper presented over the preceding five years.

- 1965 John Henderson Ingram, “The Australian Hydroelectric Industry”
- 1966 Henry Coleridge Hitchcock, “Main Generating and Electrical Equipment of Benmore Power Station”
- 1967 DG Dell, “The Benmore Land Electrode and the North Island Sea Electrode for the HVDC Transmission Scheme”
- 1968 Geoffrey H Robinson, “Harmonic Phenomena Associated with the HVDC Transmission Scheme”
- 1969 Eric Bruce Mackenzie, “Forecasting and Meeting Demands for Electrical Power in New Zealand”
- 1970 Henry Coleridge Hitchcock, “Electrical Equipment and Earthquakes”
- 1971 James William Elliott, “Determination of the Economic Sizes of Multi-Exchange Telephone Networks in New Zealand”
- 1972 Desmond Hector Jones, “Electricity Generation by Nuclear Power – the World Situation and the New Zealand Scene”
- 1973 Neville Jordan, “Radar Simulation in Training Air Traffic Controllers”
- 1974 Thomas AJ Dickens, “220KV Transmission Line, Manapouri-Bluff”
- 1975 Robert Henry Ellis, “Electrical Safety of Patients in Hospitals”
- 1976 Henry Coleridge Hitchcock, “Specification of Earthquake Resistance for Electricity System Equipment”
- 1977 Desmond Hector Jones, “Electricity from Nuclear Energy”
- 1978 Geoffrey H Robinson and Richard George Whillock, “Huntly Power Station – Some Aspects of Plant Design”
- 1979 BH Cole, “The Analysis of Substation Earthmat Voltage Fields”
- 1980 David J Byers, “The Electric Town Car – A Viable Alternative”
- 1981 Robert Browne Wilkinson, “Speech Transmission Standards in the New Zealand Telephone Network”
- 1982 Norman J Castle, “The Analysis of Losses in Distribution Networks”
- 1983 Ian J Harris, “Optical Fibre Communications”
- 1984 Ernest John Knox, “The Refit of GMV Aranui in New Zealand 1978”
- 1985 David Alan Winthrop, “Planning for a Single-Phase AC Traction Load on the New Zealand Power System”
- 1986 Julian M Elder, “Micro Hydro – Some Low Cost Alternatives”
- 1987 Richard Thomas Cecil Harman, “Progress with Electric Vehicle Concepts”
- 1988 John Talbot Boys, “Applications of Intelligent AC Drives”
- 1989 Simon Paul Moutter and GJ Campbell, “Prevention of Homopolar Generation in Steam Turbines by Reducing Residual Magnetism”
- 1990 JS Kay, “Engineering a Sea Floor Acoustic Measurement System”
- 1991 Robert John Aspden, “Origins – the Progression from Curiosity to Amenity”

## AN EVOLVING ORDER

- 1992 Andrew W Green and John Talbot Boys, “Voltage Sourced Reversible Rectifiers – Applications and Technology”
- 1993 Ernest Paul Michael Brown, “Wave Power Resource Investigation in New Zealand”
- 1994 Robert Martin Hodgson, “Digital Image Processing – a Developing Technology for Enhancing Productivity”
- 1995 Michael Miles and John Talbot Boys, “Thermal Modelling in Inverter AC Drives – Theory and Practice”
- 1996 Gerald Chung, “A Modular Approach to Designing Micro Controllers”
- 1997 Neville R Watson and Jos Arrillaga, “Frequency-dependent AC System Equivalents for Harmonic and Transient Analysis”
- 1998 Colin Edwards, “Life Extension of Old High-voltage Windings on Rotating Machines by Resin Injection”
- 1999 Jos Arrillaga, “AC/DC and Related Hits”

## EVAN PARRY AWARD FOR ENERGY SYSTEMS

In 2002, the Energy Award was created as one of the IPENZ Supreme Technical Awards for Engineering Achievers, and is presented biennially. The name for this award was changed in 2004 to the Energy Systems Award, and in 2011 became the Evan Parry Award for Energy Systems in honour of Evan Parry (1865–1938).

- 2002 George Baird (b.1938)
- 2004 John Talbot Boys (b.1940)
- 2005 Bryan William Leyland (b.1936)
- 2007 Michael Anthony Breckon (b.1949)
- 2009 John Charles Gleadow (b.1960)
- 2011 Evan John Dumbleton (b.1946)
- 2013 Raymond William Brown (b.1965)

## FREYSSINET AWARD

This award was sponsored by Prestressed Concrete (New Zealand) Limited in 1964 as a memorial to French engineer Eugene Freyssinet (1879–1962), a leading figure in the development of prestressed concrete. It recognised the best paper presented within a three-year period on a concrete design or construction topic. From 1991 this award was sponsored by the New Zealand Concrete Society and the Cement and Concrete Association of New Zealand.

- 1965 Cornelius Adriaan Slabber, “The Aramaho Railway Bridge”
- 1966 Robert George Norman, “Distribution of Loads in a Precast Floor System”
- 1967 John Perry Hollings, “The Design and Construction of a Shell-roofed Industrial Building”
- 1968 CF Candy, “Analysis of Shear Walls by Computer”
- 1969 Neil W Allardice and David Alan Thom, “The Design and Construction of the Air New Zealand Maintenance Base at Auckland Airport”
- 1970 Robert Park, “Ductility of Reinforced-concrete Frames under Seismic Loading”
- 1971 Alfred L Andrews, “Practical Analysis for Earthquake Effects in Buildings”

APPENDIX 2: AWARDS

- 1972 Johannes Barteld Huizing, Ryszard Janusz Bialostocki, Ian C Armstrong, Roland W Thornton, John H Wood and Geoffrey David Willberg, “Design of Thorndon Overbridge”
- 1973 Gordon Howard Frederick McKenzie, “Seismic Design of High Rise Buildings”
- 1974 Thomas Paulay, “Some Aspects of Shear Wall Design”
- 1975 Roger William George Blakeley and Robert Park, “The Response of Pre-Stressed Concrete Structures to Earthquake Motions”
- 1976 Roger William George Blakeley, Leslie Makepeace Megget and Michael John Nigel Priestley, “Seismic Performance of Two Full Size Reinforced Concrete Beam Column Joint Units”
- 1977 Robert Park and Thomas Paulay, “Ductile Reinforced Concrete Frames – Some Comments on the Special Provisions for Seismic Design of Act 31871 and on Capacity Design”
- 1978 Michael John Nigel Priestley, “Design Thermal Gradients for Concrete Bridges”
- 1979 Richard Collingwood Fenwick and HM Irvine, “Reinforced Concrete Beam Column Joints for Seismic Loading”
- 1980 Otto Aaron Glogau, “Separation of Non-Structural Components in Buildings”
- 1981 Peter W Taylor and RL Williams, “Foundations for Capacity Design Structures”
- 1982 Leslie Makepeace Megget, “Analysis and Design of a Base-Isolated Reinforced Concrete Frame Building”
- 1983 RC Cooney, “The Structural Performance of Houses in Earthquakes”
- 1984 Michael John Nigel Priestley, “Seismic Design of Masonry Buildings”
- 1985 Peter R Boardman, BJ Wood and AJ Carr, “Union House – a Cross-Braced Structure with Energy Dissipators”
- 1986 David R Brunson and Michael John Nigel Priestley, “Assessment of Seismic Performance Characteristics of Reinforced Concrete Buildings Constructed between 1936 and 1975”
- 1987 Howard E Chapman, Oliver Charles Langdon Cundall, John E Dunn, AT Jackson and PR Swaub, “Incrementally Launched Bridges at Ngauranga Interchange, Wellington”
- 1991 Leslie Makepeace Megget and Richard Collingwood Fenwick, “Seismic Behaviour of a Reinforced Concrete Portal Frame Sustaining Gravity Loads”
- 1992 Robert Park, Howard E Chapman, Leslie Gavin Cormack and Peter J North, “New Zealand Contributions to the International Workshop on the Seismic Design and Retrofitting of Reinforced Concrete Bridges, Bormio, Italy, April 2–5 1991”
- 1993 Peter G Lowe, “Externally Reinforced Concrete – a New Steel/Concrete Composite”
- 1994 Richard Collingwood Fenwick and Leslie Makepeace Megget, “Elongation and Load Deflection Characteristics of Reinforced Concrete Members Containing Plastic Hinges”
- 1997 Desmond Bull, Robert Park, D Elliot and A Park, “The Performance of Modular Precast Frames”
- 1998 Michael John Nigel Priestley, “Displacement-based Seismic Assessment of Existing Reinforced Concrete Buildings”
- 1999 Richard Fenwick and S Deshpande, “Design of Half Hinges in Reinforced Concrete Beams”

## FULTON-DOWNER GOLD MEDAL

This award was established in 1929 by a bequest from prominent consulting engineer James Edward Fulton (1854–1928), and in 1973 and 1988 Arnold Fielder Downer (1895–1984), the founder of Downer and Company and former NZIE President, donated to the award. The award was the Institution's premier award, usually presented annually for the best NZSCE/NZIE/IPENZ conference paper on a technical subject by a member or members.

- 1931 Edgar Ravenswood McKillop, "Stormwater Control"
- 1932 Donald F Hulse, "Mohaka Viaduct Foundations"
- 1933 Peter Holgate, "Building Construction to Resist Earthquake"
- 1934 J Wood, "Irrigation in Central Otago"
- 1935 Frederick Melrose Horowhenua Hanson, "Bituminous Surface Treatment of Rural Highways"
- 1936 John Cossar Forsyth, "Street Lighting by Electricity"
- 1937 George Pellew Anderson, "Design of Waitaki Dam"
- 1938 Francis Henry Collins, "Recent Developments in Designed Workable Concrete"
- 1939 Allen Hood Benham, "Roading in Tauranga County"
- 1941 Vernon Alan Murphy, "Design of Welded Rigid Frames"
- 1942 EC Schnackenburg, "Flood Control and River Management"
- 1943 WA Bloodworth, "Lake Taupo Control"
- 1944 Henry Featherston Toogood, "Sewage Disposal at Mackay's Crossing Military Camp"
- 1945 Walter Edward Aked, "Damage to Buildings in Wellington by Earthquake 1942"
- 1946 Isaac Richard Robinson, "Economic Aspects of Generation of Electricity in New Zealand"
- 1947 Richard Stanley Maunder, "Electrical Installations"
- 1948 NR Carter, "Construction of Waikaremoana Upper Power Development"
- 1949 Arthur David Mead, "Lower Nihotupu Water Supply, Auckland"
- 1950 A Dudley Benham, "Estimation of Extreme Flood Discharges by Statistical Methods"
- 1951 Vernon Alan Murphy, "New Technique for Investigating Stability of Slopes and Foundations"
- 1952 James Bruce C Taylor, "Progress in Engineering Seismology in New Zealand"
- 1953 Henry James Hopkins, "Modern Trends in Concrete and Reinforced Concrete"
- 1954 John Wallace Ridley, "Seepage and Uplift Pressure in and under Hydraulic Structures"
- 1955 Geoffrey Peter Keller, "The Rimutaka Railway Deviation"
- 1956 WRB Martin, "The Iron and Titanium Ores of New Zealand"
- 1957 Lindsay Samuel James, "Maraetai Hydroelectric Development"
- 1958 Richard Goulden Brickell, "Testing Foundations and Subgrades for Design Data in New Zealand"
- 1959 GB Bell and Neil Allman Mowbray, "Stability Calculations and Ship Model Tests"
- 1960 Kenneth Christie, "Engineers and Management"
- 1961 Reynolds John Annabell, "Manawatu River Pollution"
- 1962 Johannes Barteld Huizing and Alexander Gordon Stirrat, "Trends in Highway Bridging"

- 1963 Jack Warwick Francis Welch, “Maintenance of Diesel Engines in Passenger Service Vehicles”
- 1964 John Robert Fitzmaurice, “Sewage Pumping Stations”
- 1965 OT Jones, “Design of Benmore Earth Dams”
- 1966 DG Dell, “The Benmore Land Electrode and the North Island Sea Electrode for the HVDC Transmission Scheme”
- 1967 Harold C Williams, “The Gisborne Submarine Sewer Outfall”
- 1968 Arnot M McConnell, “Offshore Circulating Water System, Marsden Power Station”
- 1969 Henry Coleridge Hitchcock, “Electrical Equipment and Earthquakes”
- 1970 Thomas Henry Fancourt Nevins, “River Training Single-thread Channel”
- 1971 Geoffrey Alan Pickens, “Whau Valley Dam”
- 1972 Robert Park and Leslie Makepeace Megget, “Reinforced Concrete Exterior Beam-Column Joints Under Seismic Loading”
- 1973 Michael John Nigel Priestley, “Thermal Gradients in Bridges – Some Design Considerations”
- 1974 Reginald H Wilson, “Ecology Engineering and the Environment”
- 1975 PS Holmes, “Analysis and Prediction of Scour at Railway Bridges in New Zealand”
- 1976 Desmond Hector Jones, “Electricity from Nuclear Energy: Overseas Progress and New Zealand Requirements”
- 1977 Johannes Barteld Huizing, Roger William George Blakeley, G Ramsay, “Falsework”
- 1978 John Philip Blakeley, HR Green, Do Van Toan, “A Design Method for Heavy Duty Flexible Pavements”
- 1979 RJ Dunlop, “Lime Stabilisation for New Zealand Pavements”
- 1980 Alan Lee Titchener, “The Brazilian Alcohol Programme and some Consequences for New Zealand”
- 1981 Michael A Wesseldine, “House Foundation Failures Due to Clay Shrinkage Caused by Gum Trees”
- 1982 Takis Panagiotis Koutsos, “A Comprehensive Stormwater Disposal Scheme for Hamilton City”
- 1983 Eric R Palmer, “Wood Gasification and Energy Farming”
- 1984 Leslie Andrew Erasmus, “The Mechanical Properties of Structural Steel Sections Supplied to B54360 Grade 43A or as 1204 Grade 250 and the Relevance of these Properties to the Capacity Design of Structures”
- 1985 Michael J Pender, “Stability of Slopes in Closely Jointed Rock”
- 1986 Simon Paul Moutter and GJ Campbell, “Prevention of Homopolar Generation in Steam Turbines by Reducing Residual Magnetism”
- 1987 Ronald Powell Carter, Do Van Toan and Peter B Riley, “Grouting and Drainage of the Patea Diversion Tunnel”
- 1988 Leslie Andrew Erasmus, “Seismic Energy Dissipation with Ring Springs”
- 1989 Geoffrey Alan Pickens, “The Maitai Water Supply Project”
- 1990 Nicholas Andrew Walmsley and Martin Harold Ferner, “An Evaluation of Dual Power Lagoons”
- 1991 John Talbot Boys and Andrew W Green, “Voltage Sourced Reversible Rectifiers – Applications and Technology”
- 1992 Peter G Lowe, “Externally Reinforced Concrete – a New Steel/Concrete Composite”

## AN EVOLVING ORDER

- 1993 Martin John Bloxam and Clifford John Boyt, “Victoria Bridge Rehabilitation”
- 1994 John Talbot Boys and Andrew W Green, “Inductively Coupled Power Transmission: Concept, Design and Application”
- 1996 Andrew W Green and John Talbot Boys, “Intelligent Road-studs – Lighting the Paths of the Future”
- 1997 Robert Park, “Structural Behaviour of Reinforced Concrete Columns Incorporating High Strength Materials”
- 1998 Alastair Barnett, “The Museum of New Zealand – Flood Protection Lessons”
- 1999 D Gaunt, “Small Section Glulam Utilising Both Corewood and Slabwood”

## FULTON-DOWNER GOLD MEDAL – PRESIDENT’S AWARD

The President’s Award was a special award established in 1990. In 2005 it was renamed the Fulton-Downer Gold Medal – President’s Award in recognition of important contributors to the Institution formerly honoured through the Fulton-Downer Gold Medal.

Generally presented annually, the Fulton-Downer Gold Medal – President’s Award recognises outstanding achievement within the profession by an IPENZ member or group of members. Recipients demonstrate the strengths of the engineering profession in its role of public service. It is one of the highest accolades the Institution bestows.

- 1990 Members of the IPENZ East Coast Branch
- 1992 Charles J McFarlane
- 1994 John Charles La Roche (b.1937)
- 1995 Gerry Lynn Te Kapa Coates (b.1941)
- 1997 Gerhardt Pallo (b.1935)
- 1998 Jos Arrillaga (1934–2009)
- 1999 John Talbot Boys (b.1940)
- 2000 David Alan Thom (b.1924)
- 2001 Arthur Francis Small (b.1946)
- 2002 William Sam Wakelin (b.1941)
- 2003 Nicolas Smith (b.1964)
- 2004 Neville Bertram Beach (1931-2010)
- 2004 Peter Milton Ronald Browne (b.1939)
- 2005 Competency Assessment Board (2002–2004)
- 2006 John Robert Fitzmaurice (b.1929)
- 2007 Basil John Wakelin (b.1941)
- 2008 Stephen Reindler (b.1953)
- 2008 Barry Joseph Grear (b.1937)
- 2009 William John Darnell (b.1945)
- 2010 Paul Joseph Wilson (b.1956)
- 2011 IPENZ members active in the response phase following the 2010 and 2011 Canterbury earthquakes were recognised for their outstanding contribution to public service
- 2012 John Anthony Gibson (b.1942)
- 2013 Henry John Hare (b.1962)

## FULTON-DOWNER SILVER MEDAL

This award was established by the same bequest as the Fulton-Downer Gold Medal. It was usually awarded for the best NZSCE/NZIE/IPENZ conference paper on a technical subject by a graduate member or members.

- 1932 AG Park, "Lateral Pressure of Earth"
- 1934 Keith J Mawson, "Design of Circular Reinforced-concrete Reservoirs"
- 1935 Eric Ernest Hendriksen, "Seismic Coefficients"
- 1936 John P Brodie, "Suburban Road Construction"
- 1937 ER Simpson, "Aerodromes"
- 1938 Eric Harold Carew, "Oxygen Cutting as a Precision Process"
- 1939 Neil Gilbert Hansen, "Laboratory Tests for Road Soil Stabilisation"
- 1941 WP Edwards, "Cantilever Retaining Walls"
- 1944 Brian Purcell Tapper, "Design of a Broken Rock Storage Bin"
- 1951 JD Bradshaw, "The Classification and Handling of Concrete Aggregates"
- 1954 EJ Barnard, "Radiographic Examination of Welding"
- 1958 Peter Alexander Thomson, "Some Features of Aerial Surveying in Relation to Engineering in New Zealand"
- 1959 Francis Nicchols Blackwell, "Heating and Ventilating Broadcasting House"
- 1960 Donald R Murphy, "No-break Power Plant"
- 1961 Brian D Cashin, "Engineers' English"
- 1962 RA James, "Transmission of Teleprinter Signals"
- 1963 CH Keenan, "Behaviour of M V Underground Cables under Fault Conditions"
- 1964 DA Ashe, "Resistance Ratiometer"
- 1965 DK Brady, "A Comprehensive Sewer Design Chart"
- 1966 Brian Heywood, "Measurement of Phase Variation on a Microwave Radio Path"
- 1966 MA Louden, "Valves, Valve House and Indoor Equipment at the Converter Stations for the HVDC Transmission Scheme"
- 1967 John Philip Blakeley, "Deflection of Reinforced Concrete Beams Under Working Loads"
- 1968 AJ Fitchew, "Design of a Railway Marshalling Yard"
- 1969 PB Graham, "Earth Station Antennas for Satellite Communications"
- 1970 Neville Jordan, "Radar Simulation in Training Air Traffic Controllers"
- 1971 Robert M Gilmour, "Insulator Pollution"
- 1972 Clive D Matthewson, "Curvature of Precast Reinforced Concrete Panels Owing to Shrinkage"
- 1974 Frank Edward Wharton, "The Development and Design of a Special Purpose Shredding Machine"
- 1977 P Stephenson, "Physico-Chemical Treatment of Organic Wastewaters"
- 1980 Stanley R Nicoll, "The Recovery of Heat from Textile Dryer Exhausts"
- 1983 Bruce J Harker, "Estimation of the Harmonic Currents Entering the Power System as a Result of Supply to AC Electrified Railway Traction"
- 1985 BA MacDonald, "Improved Robot Design"
- 1987 RJ Penny, "Modern Control Current AC Drives"

## AN EVOLVING ORDER

- 1989 Brian Dale Pidwerbesky, “Commissioning the Canterbury Accelerated Pavement Testing Indoor Facility”
- 1990 KC Henderson, “The Development of an Active Harmonic Filter for Power Systems”
- 1991 Thillainath Chelliah, “Use of Geotextiles in Pavement Maintenance”
- 1992 David J Hunter, “New Generation Service Station Attraction”
- 1993 Andrew W Green, “A Computer Controlled Dynamometer for Ricardo E6 Research Engines”
- 1994 Kevin E Hill, “Design Aspects for Incorporating Ring Springs into Practical Systems”
- 1995 Kevin E Hill, “A Prototype Ring Spring Cartridge for Mitigating Transient and Seismic Inputs”
- 1996 Kevin E Hill, “A Pivotal Rocking Seismic Isolation System for Protecting Columnar Structures During Earthquakes”
- 1997 Brian Dale Pidwerbesky, “Comparative Evaluations of Loadman, FWD, Benkelman Beam, Nuclear Density Meter and Clegg Impact Hammer for Testing Unbound Granular Pavements”
- 1998 Stuart Park, “Recycled Construction Rubble as Concrete Aggregate”
- 1999 Jitesh Raniga and Ramesh Rayudu, “Stretching Transmission Line Capabilities – a Transpower Investigation”

## FULTON-DOWNER SILVER MEDAL – PRESIDENT’S AWARD

The Fulton-Downer Silver Medal – President’s Award recognises meritorious service within the engineering profession. It is conferred directly by the President when a case of particular merit is identified, and with the IPENZ Board’s agreement.

- 2011 John A Findlay (b.1957)

## FURKERT AWARD

This award was endowed in 1948 by Frederick William Furkert (1876–1949), former Engineer-in-Chief of the Public Works Department and past President of the Institution. The award was made for the best paper by an NZIE/IPENZ member or group of members published by the Institution within a period of five years on a subject dealing with the action and forces of water on the works of man.

- 1951 Frank R Askin, “Use of Small Scale Models in the Design of Hydraulic Structures”
- 1952 JS Roberts, “Sewage Flow Investigations at Invercargill”
- 1953 EC Schnackenberg, “Slope Discharge Formulae for Alluvial Streams and Rivers”
- 1954 John Charles North, “Cylindrical Reinforced Concrete Surface Tanks”
- 1955 Walter Gordon Morrison, “The Hutt Estuary Bridge”
- 1956 Eric Ernest Hendriksen, “Wellington Metropolitan Water Supply: Hutt River Scheme”
- 1957 James A Goodsir and Ronald Arthur Joseph Smith, “Design of a Reinforced-concrete Wharf for the Auckland Harbour Board”

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- 1958 FV Doidge, "Pozzolana Investigations"
- 1959 Cyril Wilfred Firth, "Auckland Water Supply"
- 1960 Robert George Norman, "A Prestressed Concrete Bridge over Tauranga Harbour"
- 1961 John Burgess Rowntree, "Concrete Pipes and Sewers"
- 1962 Hubert Reynolds Bach and HM Cotton, "Hutt Valley Sewage Disposal Scheme"
- 1963 BJ Rowe and MR Sargent, "Manukau Harbour Siphon"
- 1964 GA Lindell, "Cook Strait Ferry – Wellington Terminal"
- 1965 Charles Peter Owen Turner, "Submergence Effects on Bridge Piers under Earthquake"
- 1966 Archibald Parkes Campbell, "Hydrology in New Zealand"
- 1967 Paul G Evans, "The Lower Manawatu River Control Scheme"
- 1968 Harold C Williams, "The Gisborne Submarine Sewer Outfall"
- 1969 Arnot M McConnell, "Offshore Circulating Water System Marsden Power Station"
- 1970 PD Holmes and AG Park, "The Design of a Moundtype Breakwater for Taranaki"
- 1971 Thomas Henry Fancourt Nevins, "River Training-Single Thread Channel"
- 1972 Harry B Goodman, Roger L Preston and MG Smith, "Restoration of Waioeka Gorge Highway after Feb 1967 Flood"
- 1973 Gilbert Gardner Natusch, "Power Investigations in New Zealand"
- 1974 Geoffrey Alan Pickens, "The Whau Valley Dam"
- 1975 Graham J Ade, Peter G Armstrong, and Arnot M McConnell, "Offshore Loading Systems using Slurrying Techniques"
- 1976 PS Holmes, "Analysis and Prediction of Scour at Railway Bridges in New Zealand"
- 1977 Paul S Wells-Green, "Currents, Waves & Sediment Transport, Upper Waitemata Harbour"
- 1978 Robert A Callander, "Hydraulics of Culvert Outlets"
- 1979 David Leicester Steven, "City of Hamilton Water Pollution Control Plant"
- 1980 DH Chisholm, "Wellington Airport Extension Additional Sea Protection"
- 1981 Peter B Nissen, "The Kelantan River Basin Study"
- 1982 Robert J Keller, "Hydraulic Model Tests of Huntly Power Station Cooling Water Intake Structure"
- 1983 Robert A Callander and John N Duder, "Reservoir Sedimentation in the Rangitaiki River"
- 1984 AK Thomson, "Submarine Sewer Outfall-design and Construction"
- 1985 John Robert Fitzmaurice and Ray M Hedgland, "Milliscreen Treatment of Municipal Wastewater"
- 1986 Geoffrey Alan Pickens, Bryan W Leyland and John N Duder, "The Aniwhenua Hydro Electric Scheme"
- 1987 Stephen M Thompson, "Scour Depth Measurements at a Caisson Pier, Ohau River"
- 1988 Ronald Powell Carter, Do Van Toan and Peter B Riley, "Grouting and Drainage of the Patea Diversion Tunnel"
- 1989 Clifford John Boyt, "Effect of Chlorination of Sewage Effluent on Inactivation of Viruses"
- 1990 Geoffrey Alan Pickens, "The Maitai Water Supply Project"
- 1991 William J Henderson, "The Dunedin Water Pollution Control Plant – History, Commissioning and the First Years of Operation"

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- 1992 Nicholas Andrew Walmsley and Martin Harold Ferner, “An Evaluation of Dual Power Lagoons”
- 1993 Edward Brian Williman and Lindsay C Crossen, “Hokitika River Mouth Bridge Length Study”
- 1994 Garry J Macdonald and John RG Harding, “The Proposed Wellington Treated Sewage Outfall”
- 1997 Murray D Gillon and Gregory J Saul, “Cairnmuir Landslide Infiltration Protection Stabilisation Works”
- 1998 John N Duder, “Reservoir Sedimentation – Some Aspects of Reservoir Asset Management”
- 1999 M Pennington, “Hydraulic Roughness of Bored Tunnels”

## FURKERT AWARD FOR SUSTAINABILITY AND CLEAN TECHNOLOGY

In 2005, the Furkert Award for Sustainability and Clean Technology was created as one of the IPENZ Supreme Technical Awards for Engineering Achievers, presented biennially. It is named in honour of Frederick William Furkert (1876–1949).

- 2006 Ian G Bywater (b.1943)
- 2008 Ralph Sims
- 2010 Ron Laurence McDowall (b.1951)
- 2012 Donald John Cleland (b.1960)

## INFRASTRUCTURE, UTILITIES AND TRANSPORT AWARD

In 2004, the Infrastructure, Utilities and Transport Award was created as one of the IPENZ Supreme Technical Awards for Engineering. It was awarded only once before being subsumed into the Dobson Award for Transportation Infrastructure and the Utilities and Networks Award (from 2011 known as the Angus Award for Water, Waste and Amenities).

- 2004 Paul Aaron Sampson (b.1943)

## INNOVATION AWARD

The IPENZ Innovation Award was an annual award recognising an IPENZ member or group of members who demonstrate an ongoing commitment to innovation in engineering practice. This award was replaced by the New Zealand Engineering Excellence Awards – Innovator of the Year award.

- 2002 Richard Templer (b.1967)
- 2003 Jim Bradley (b.1947), Alan Bannatyne (b.1946), John Harding (b.1947), Richard Chilton (b.1942)
- 2004 Peter Robinson (b.1952)

## MACLEAN CITATION

This award was established as a memorial to founding member and former NZSCE President, Francis William MacLean (1858–1951). The IPENZ governing Board awards the MacLean Citation, one of the Institution’s premier awards, on a case-by-case basis to those engineers who have made an outstanding contribution to the profession.

- 1954 Frederick Templeton Mannheim Kissel (1881–1962)
- 1957 William Langston Newnham (1888–1974)
- 1959 Leslie Bertram Hutton (1889–1972)
- 1965 Francis Malcolm Corkill (1892–1970)
- 1967 Charles Stephen Plank (1905–1970)
- 1971 Cyril John Mulley Choat (1901–1982)
- 1977 Eoin Robert Garden (1903–1997)
- 1986 Alan Lee Titchener (1920–1994)
- 1989 David Alan Thom (b.1924)
- 1991 Edward Guy Samuel Powell (1906–1998)
- 1994 B Wakelin
- 1997 Robert Browne Wilkinson (b.1939)
- 1998 Raymond Francis Meyer (b.1931)
- 2002 Peter Colin Smith (b.1947)
- 2003 David John Bunting (b.1946)  
Jennifer Ann Culliford (b.1947)
- 2005 Barry James Britten Brown (b.1946)
- 2011 David Ronald Brunsdon (b.1959)
- 2012 Alan Norman Bickers (b.1945)

## PROFESSIONAL COMMITMENT AWARD/TURNER AWARD FOR PROFESSIONAL COMMITMENT

The Professional Commitment Award was instituted by Reginald John McCarten (1925–2003) in 1981, and combined with the Turner Lecture in 2005 to create the annual Turner Award for Professional Commitment. The award recognises continuing contribution to the engineering profession as demonstrated by a commitment to the ideals of a self-regulating profession.

- 1983 Robert John Aspden (b.1938)
- 1984 Norman Grant Major (1932–2006)
- 1985 Thomas Paulay (1923–2009)
- 1986 HE Elder  
Eric Rex Palmer (b.1943)
- 1987 Charles George Martin (1918–1990)
- 1988 BS Wakelin
- 1989 Ronald Clifford Brooks (b.1935)
- 1990 Adrianus Cornelius van Beek (b.1948)
- 1992 David William King (b.1925)

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- 1993 Robert Park (1933–2004)
- 1994 Ruth Gretchen Kivell (b.1948)
- 1995 Alan Archibald Winwood (b.1948)
- 1996 David Ronald Brunson (b.1959)
- 1997 Alan Norman Bickers (b.1945)
- 1998 Alexander James Sutherland (b.1939)
- 1999 Peter Terence McCombs (b.1943)
- 2000 David Conway Hopkins (b.1943)
- 2001 Gerry Lynn Te Kapa Coates (b.1941)
- 2002 Leslie Makepeace Megget (b.1946)
- 2003 Norman Royal Stannard (b.1941)
- 2004 John Nelson Duder (b.1938)
- 2004 Desmond Kenneth Bull (b.1958)
- 2005 Roger Charles Malcolm Dunn (b.1939)
- 2006 Michael John Pender (b.1943)
- 2007 Terence John Kayes (b.1945)
- 2008 Malcolm Douglass (b.1932)
- 2009 Adam William Thornton (b.1952)
- 2010 David Page Adamson (b.1958)
- 2011 Jennifer Ann Culliford (b.1947)
- 2012 Michael James Haydon (b.1949)
- 2013 Peter James Millar (b.1949)

## RABONE AWARD

This award was endowed in 1968 by NZSCE foundation member Thomas Cedric Victor Rabone (1891–1970) for a paper by an NZSCE/NZIE member within a five-year period which was of exceptional merit on a topic outside the scope of the Institution's other awards. Prior to this, a special award would be presented.

- 1932 George Pellew Anderson, "Hydroelectric Power Supply in the North Island"
- 1935 William Langston Newnham, "Protection of Structural Steel"
- 1935 Leslie Bertram Hutton, "Lightning and Distribution Systems"
- 1937 Frederick Melrose Horowhenua Hanson, "Preparation of Rural Highways for Bituminous Surface Treatment"
- 1938 PJ Alley, "Soil Mechanics of Southland Roadmaking Materials"
- 1944 CR Russell, "Gas Producer and Application to Automobiles and Trucks"
- 1947 Lloyd Mandeno, "Rural Power Supply"
- 1948 PJ Alley, "Losses in Soil Cement Mixtures"
- 1948 Frederick Melrose Horowhenua Hanson, "Relationship of Metal Depths and Subgrade Properties for Modern Highway Loads"
- 1951 JS Roberts, "Sewage Flow Investigations at Invercargill"
- 1957 Henry James Hopkins, "Relationship of Engineering and Engineering Science"
- 1957 George Fraser Bridges, "Platelaying to Timetable"
- 1961 C Jack Tse, "Wellington Airport Pavement Construction"

- 1965 Stephen M Thompson, "Impulse Measurement"
- 1966 Ronald Arthur Joseph Smith, "Central Area Properties Redevelopment Scheme for the Auckland Harbour Board"
- 1969 Malcolm Douglass, "Traffic Planning and the Functions of a Road Network"
- 1970 FPS Lu, "Introduction to Engineering Economics"
- 1972 Alan Lee Titchener, "Problems and Developments in Education for Professional Engineers"
- 1973 Brian B Hasell, "Dunedin One Way Street System"
- 1974 Basil V Walker, "An Economic Assessment of Dissolving Pulp Production in New Zealand"
- 1975 RH Wilson, "Ecology, Engineering and the Environment"
- 1976 GR Martin, "Continuing Education – the Need for a Positive Approach"
- 1977 HE Bauer, "The Environmental Impact of Thermal Power Station Siting"
- 1978 Michael J Pender, "Probabilistic Assessment of the Stability of a Cut Slope"
- 1979 D Raisbeck, "Strength Parameters of Weathered Sandstone"
- 1980 Clifford R Barnett, "Fire Engineering Formulas for Building Designers"
- 1981 WD Pringle, "Funding Guidelines for Shared Transport"
- 1982 John Philip Blakeley, HR Green, Do Van Toan, "A Design Method for Heavy Duty Flexible Pavements"
- 1983 Michael A Wesseldine, "House Foundation Failures Due to Shrinkage caused by Gum Trees"
- 1984 MG Smith, "Urban Bus Travel in Christchurch"
- 1985 Roger Brian Keey, "The Acceptability of Risky Projects with Particular Reference to Process-related Hazards"
- 1986 Clifford R Barnett, "Timber in Fires – Review of Chemical and Physical Characteristics"
- 1987 Graham Salt, "The Use of Residual Strengths of Soils in Geotechnical Engineering Design"
- 1988 Alan G Ferry and Norman G Major, "Putting Some Metal on the Road"
- 1989 Michael Laurence Gadd, "Physical Traffic Restraint Measures"
- 1990 PS Holmes and David Alan Thom, "The Horopito Deviation – Environment Management"
- 1991 Brian Dale Pidwerbesky, "Pavements, Vehicles and the Fourth Power Law: What is the Relationship?"
- 1992 Andrew H Buchanan, "Timber Engineering and the Greenhouse Effect"
- 1993 Donald K Taylor, "The Use and Misuse of Geotechnology in Civil Engineering"
- 1994 Pathmanathan Brabharan and John V Vessey, "Waipoa Water Treatment Augmentation Plant"
- 1998 Michael J Pender, "Aspects of the Geotechnical Behaviour of some New Zealand Materials"
- 1999 S Crawford and P Millar, "The Design of Permanent Slopes for Residential Building Development"

## **RABONE AWARD FOR INFORMATION, COMMUNICATIONS, ELECTRICAL AND ELECTRONIC TECHNOLOGY**

In 2002 the Information and Communications Award was created as one of the IPENZ Supreme Technical Awards for Engineering Achievers, and it is presented biennially. In 2005 it was renamed the Rabone Award for Information and Communications, in honour of Thomas Cedric Victor Rabone (1891–1970). The current award name came into use in 2010.

- 2002 Alastair Gordon Barnett (b.1943)
- 2006 Laurence Edward Zwimpfer (b.1948)
- 2008 Duncan Alexander Hall (b.1957)
- 2010 Alan Ross Jamieson (b.1945)
- 2012 Bill Buckley (b.1945)

## **SKELLERUP AWARD FOR FOOD, BIOPROCESS AND CHEMICAL**

In 2002, the Food, Bioprocess and Chemical Award was created as one of the IPENZ Supreme Technical Awards for Engineering Achievers, and is presented biennially. The current award name came into use in 2005 and honours George Waldemar Skellerup (1881–1955), who initiated the development of the Lake Grassmere Solar Salt Works in the 1940s.

- 2002 Richard Laurence Earle (b.1930)
- 2004 Max James Kennedy (b.1961)
- 2005 Timothy Patrick Dobbie (b.1941)
- 2007 Russell John Burton (b.1954)
- 2009 Paul Stephenson (b.1952)
- 2011 Anthony Henry John Paterson (b.1952)
- 2013 Paul Clifford Austin (1948–2012)

## **STUDENT DESIGN AWARD/RAY MEYER MEDAL FOR EXCELLENCE IN STUDENT DESIGN**

IPENZ's Student Design Award was an annual award recognising engineering excellence at the student level, and rewarded innovation and entrepreneurial potential. In 2008 this award was replaced by the Ray Meyer Medal for Excellence in Student Design in honour of Raymond Francis Meyer (b.1931), former IPENZ President and Dean of the School of Engineering at The University of Auckland.

- 1999 Adam Lyness and Tim Johnson (University of Canterbury)
- 2000 Katherine Doerr
- 2001 Andrew Gow (Massey University)
- 2003 Heather Walker, Michael Priest and Royce Fleming (University of Waikato)
- 2004 Fady Mishriki and Kunal Bhargava (The University of Auckland)
- 2005 Aaron Jonassen, Andrew Morrison, Jonathon Saunders and Nicola Withington (University of Waikato)

- 2006 Michael Willacy, Timothy Lonergan and Aaron Le Compte (University of Canterbury)
- 2008 Jason Greaves, Rhys Hayward, Bundit Kijalakorn and Ibrahim Sugawara Ahmad (University of Canterbury)
- 2009 Daniel Barry, Kim Hedley, Samuel Horgan and Mathew Pottinger (University of Canterbury)
- 2010 Avinash Aden Rao, Ben Gadsby, Ben Scott and Nathan Allpress (University of Canterbury)
- 2011 James Steel, Logan Ward, Alicia Evans and Chia Siong Tan (University of Canterbury)
- 2012 Heath Vinicombe and Andrew Li (University of Auckland)
- 2013 Lachlan Clelland (Wellington Institute of Technology)

### **YOUNG ENGINEER OF THE YEAR AWARD**

IPENZ's Young Engineer of the Year Award is an annual award recognising an IPENZ member (aged 35 years or under) who has made an excellent contribution as an engineer, as a leader, and/or through community involvement. In 2005, this award was replaced by the New Zealand Engineering Excellence Awards – Young Engineer of the Year Award.

- 1992 Donald Clelland (b.1960)
- 1994 Christopher Heaslip (b.1958)
- 1995 Greg Lowe
- 1996 Saeid Nahavandi (b.1962)
- 1997 Jennifer Adams-Smith (b.1961)
- 1998 Gordon Weir (b.1971)
- 1999 David Bouma (b.1964)
- 2000 Lisa Roberts (b.1968)
- 2001 Ian Greenwood (b.1970)
- 2002 Christopher Mardon (b.1970)
- 2003 William Peet (b.1971)
- 2004 Glenn Fawcett (b.1969)



# LECTURES

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## DOBSON LECTURE

This lecture series presented to secondary school students was named after a pioneering engineering family. Edward Dobson (1816–1908) was a prominent engineer who helped establish Canterbury’s School of Engineering, and his son, Sir Arthur Dudley Dobson (1841–1934), was NZSCE President in 1924–1925. The initial objective of the lectures was to encourage students to study engineering. However, it was eventually broadened to appeal to a general audience.

- 1961 John Wallace Ridley, CE Taylor and Arthur E Davenport, “Power for the Nation”
- 1962 RA Stables, “Transport for the Nation”
- 1962 Percy Lyndon Laing, “Engineering Moves the Earth”
- 1962 Alan Thomas Gandell, “The World of Wheels”
- 1962 IFB Walters, “The Jet Age”
- 1963 Edwin W de Lisle, “Communications for the Nation”
- 1963 JC Greig, “What Does a Communications Engineer Do?”
- 1964 Robert George Norman, “New Zealand Constructs”
- 1964 WD Williamson, “Men at Work”
- 1965 Peter Gray Scoular, “Municipal Engineering”
- 1965 Henry James Hopkins, “Engineers in the Making”
- 1966 Eoin Robert Garden, “The Engineer and Industry”
- 1966 Charles Frederick Martindale, “Engineers in the Making”
- 1967 Hugh Alexander Fullarton, “Managing Men and Materials”
- 1968 Harry A Holland, “Engineering in the Forest”
- 1969 Ivan L Holmes, “The World of the Structural Engineer”
- 1969 Reginald William Kennedy Stevens, “Engineering Education and Training”
- 1970 Alexander Gordon Stirrat, “Engineering for Society”
- 1971 Robert John Aspden, “Engineering for the Nuclear Age”
- 1971 Neville Jordan, “Education for Engineering”

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- 1972 JV Brown, “Engineers in the Community”
- 1972 Roger Charles Malcolm Dunn, “Qualifications and Training for Engineers”
- 1974 Dove-Myer Robinson, “The Engineer’s Responsibility to the Public”
- 1975 Norman C Rasmussen, with a panel of CE Nixon, Robert George Norman and Ruth Black, “The Nuclear Power Option – a Current Assessment”
- 1977 Robert George Norman, “Fly Now – Pay Later. An Engineer looks at Future Problems in Developing and using our Resources”
- 1979 Mervyn Probine, “The Electronic Revolution – Look Ma, No Hands”
- 1981 Alan Lee Titchener, “Energy – the Scare and Plentiful Resources or is there a Lignite at the End of the Tunnel?”
- 1983 Michael Fowler, “Seismic Upgrading of Buildings – Effects upon Wellington City”
- 1985 Allan Hellaby, “Preparing New Zealand for the 21st Century”
- 1986 Norman C Rasmussen, “Engineering of Submerged Tunnels”

## HOPKINS LECTURE

This lecture was established, in collaboration with the University of Canterbury, in recognition of Henry James Hopkins’ (1912–1986) distinguished engineering service in the engineering field. The aim of the lecture was to encourage discussion within the profession, and to also enhance public understanding of engineering issues.

- 1978 Henry James Hopkins, “A Land of Bridges”
- 1979 WM Duncan, “Energy and Engineering”
- 1980 Peter W Taylor, “Engineers – Leaders or Followers? Changes in Engineering Education”
- 1981 SMJ Smith, “Big Can Be Beautiful – Hydro Electric Construction on the Waitaki”
- 1982 IB Reynolds, “Concrete the Versatile Building Material”
- 1983 John Henderson Ingram, “New Zealand Steel Ltd – Opportunities and Obstacles”
- 1984 Ken Piddington, “Ethic of Environmental Engineering”
- 1985 Michael Fowler, “Cities at Risk”
- 1986 Robert George Norman, “Politics and Passion: Adventures in Engineering”
- 1987 RA Flint, “Structure Reliability and the Community”
- 1988 Ronald Powell Carter, “Consulting Engineers Here and Abroad”
- 1989 Robert Jones, “Time for a Rethink – the Case for Nuclear Energy”
- 1990 Peter Troughton, “The Future of Telecommunications in New Zealand”
- 1991 Roger Blakeley, “Environmental Challenges in the 1990s”
- 1992 Edmund Hillary, “Building Primitive but Effective Structures in Remote Places”
- 1993 Miles Warren, “Engineers and Architects – Love Hate Relationship”
- 1994 Geoffrey Palmer, “International Law and the Global Environmental Challenge”
- 1995 Catherine Tizard, “Engineering and its Customers”
- 1996 Tom Schnackenberg, “Teamwork and Technology in the America’s Cup”
- 1997 Nick Smith, “The Greening of the Engineering Profession”
- 1998 Roger Estall, “Engineering Improvement in Fire Risk Management”
- 2000 Robert Park, “Improving the Resistance of Structures to Earthquakes”
- 2001 Gil Simpson, “Imagine”
- 2002 David Hopkins, “Consulting Engineering, Serious Fun”

- 2003 Tom O'Rourke, "Lessons Learned from the World Trade Centre Disaster: Critical Engineering Systems"
- 2004 Pete Hodgson, "Energy Planning in New Zealand"
- 2005 Gavin Cormack, "Engineering Innovation and the Creation of Lasting Value"
- 2006 Don Elder, "The Economy and Energy: are both Sustainable?"
- 2007 Henry Petrovski, "Success and Failure in Design"
- 2008 Geoffrey Henderson, "Wind Power – One of Many Ways to a Carbon-neutral Economy"
- 2009 David Salisbury, "Using Technology to Unlock Oil and Gas Resources"
- 2010 Paul Jowitt, "Now is the Time"
- 2011 Roger Sutton, "Getting the Power Back on to Canterbury"
- 2012 Helen Clark, "Building Resilience. The Importance of Prioritising Disaster Risk Reduction, A United Nations Development Programme Perspective"
- 2013 Nicholas Davidson, "Pike River: An Accumulation of Observable Risk which Demands our Understanding"

## NEWNHAM LECTURE

In 1970, the NZIE Council decided to commemorate William Langston Newnham's (1888–1974) distinguished engineering career and service to the Institution through a namesake address or lecture delivered at the Institution's annual conference.

- 1970 Robert George Norman, "Engineer in Society"
- 1971 Alexander Gordon Stirrat, "The Challenge of the 1970s"
- 1972 RM Williams, "Professional Education and the Engineer"
- 1972 RK Davison, "Conservation of the Environment"
- 1974 John L Newnham, "Engineering for Tourism"
- 1975 CG Martin, "The Fairy Tales of Science"
- 1976 Reginald William Kennedy Stevens, "Status and all That"
- 1977 Henry James Hopkins, "Community Leaders and their Engineering Advisers"
- 1978 Mike Minogue, "The Changing Role of the Engineer"
- 1979 JF Duncan, "The Engineer in the Future"
- 1980 Gordon Dryden, "Twenty Years on – Co-operative Enterprise Called for in New Zealand"
- 1981 Lance A Endersbee, "Engineering in a Participating Democracy"
- 1982 Arnot M McConnell, "The New Zealand Engineer in International Business"
- 1983 DO Walker, "New Technologies Vital in Forest Industry"
- 1984 R Weir, "Looking Back at and Forward to Engineers' Role in a Developing Economy"
- 1985 AR Turner, "The Changing Basis of Decision-Making: Is Reason Sufficient?"
- 1986 Martin Finlay, "Industrial Relations"
- 1987 H Rennie, "New Zealand in the 1990s – Technology Conquered, or Conquered by Technology"
- 1988 RS Deane, "Is Corporatisation Relevant to Engineers?"
- 1989 A McD McLachlan, "Management and Engineering"
- 1990 Nay Hunt, "Environmental Challenges and Opportunities"

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- 1991 WJ Rourke, "Engineering our Common Future"
- 1992 Martin H Thomas, "The Tasman Engineers: Contribution to Civilisation"
- 1993 J Williams, "Engineers' Responsibilities to Society"
- 1994 Brian L Rhoades, "Adding the Value"
- 1995 Simon Upton, "Whatever Happened to the Idea of Progress?"
- 1996 R Kerr, "Celebrating Creativity: Engineering in a Market Economy"

## PICKERING LECTURE

This annual lecture series was named in honour of William Pickering (1910–2004), a Wellington-born engineer and scientist who was a leading light in the United States' space programme.

- 2003 George Serrallach, "Engineering and Sport"
- 2004 Don Pettit, "Living in Space - An Engineer's View"
- 2005 Alistair Barnett, James Goff and William Power, "Tsunami Coming to a Town Near You?"
- 2006 Mike Treader, David Officer and Richard Blaikie, "Nanotechnology"
- 2007 Steve Reindler, "Auckland International Airport: The Engineering Story"
- 2008 Mike Duke, "Plug in New Zealand: Switch on to Electric Cars"
- 2009 Muriel Watt, "The Future of Solar Energy: Developments in Photovoltaics and Opportunities for New Zealand"
- 2010 Glenn Martin, "The Martin Jetpack: A Remarkable Story of Engineering and Entrepreneurship"
- 2011 Ray Avery, "Innovation through Observation"
- 2012 John Boys and Grant Covic, "The Future of Road Technology"
- 2013 Neville Jordan, "How an Engineer Spots New Technology and Creates a Billion-dollar Business"

## TURNER LECTURE

The Turner Lecture was established in 1985 by an endowment from Charles William Oakley Turner (1901–1994), former Engineer-in-Chief of the Public Works Department, for a lecture exploring engineering, the law and contracts. In 2005 the lecture was combined with the Professional Commitment Award to create the Turner Award for Professional Commitment.

- 1987 IL McKay, "The Professional Role of the Engineer"
- 1989 George Samuel Beca, "Reflections on the General Conditions of Contract"
- 1993 Laurence Street, "Alternative Dispute Resolution"

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