ROYAL HISTORICAL SOCIETY
OF QUEENSLAND
JOURNAL

Volume 20, No. 7 **August 2008**

Bundaberg's Gethsemane: the tragedy of the inoculated children†

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In early 1928, two events focused national media attention on the provincial Queensland city of Bundaberg. One was euphoric. Bundaberg-raised aviator, Bert Hinkler, had flown the first solo transit from England to Australia and, on 27 February, triumphantly landed his biplane at North Bundaberg. Hinkler's feat was a timely distraction to a community tragedy. Four weeks earlier, on Saturday 28 January, the sugar city was awash with rumours about deceased and dying children. Within 48 hours, the *Bundaberg Daily News and Mail* confirmed what was already common knowledge. Over the weekend, 12 children had died following inoculation against diphtheria. Another five were seriously ill in hospital. The calamity became a part of Australian medical history that still attracts intermittent mention in the scientific literature. However, the mishap

Bourbong Street, Bundaberg, c. 1930.
(Picture Queensland Collection, State Library of Queensland)

†This article has been peer reviewed.

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Bert Hinkler, 1920s.
(Picture Queensland Collection, State Library of Queensland)

has received surprisingly little interest from historians. Accordingly, this paper revisits a momentous day in Bundaberg: Friday 27 January 1928.

The background

The era was one when diphtheria was a common, serious and notifiable disease. The public appreciated its communicability and the special vulnerability of young children. Family and school-teachers often recognised early symptoms and did not hesitate to make a provisional diagnosis of either croup or diphtheria. Moreover, the School Medical Service within the Queensland Department of Public Instruction complied with the *Diphtheria Regulations*, which involved swabbing programs that detected carriers. Afflicted individuals generally sought treatment, if for no other reason than family or peer pressure. Suspected carriers were often quarantined either in home, hospital or in the case of an epidemic, in temporary camps. Emergency treatment for acute symptoms was dramatic and often involved tracheal intubation; and (after 1935) tracheostomy (surgical perforation to the airway). An outbreak in London in 1921 cost that city's ratepayers 'about £500 000'.[1] In 1927-28 Queensland figures revealed 1859 cases and 70 deaths, with the former number being a 15 percent fall from the previous year.[2] Clearly in the 1920s, diphtheria was a major public health problem.

Although the Commissioner for Public Health and the federally funded Commonwealth Serum Laboratories had recommended immunisation in 1921 and although there was no direct cost to the recipient, it took five years for two Queensland local authorities to implement the measure.[3] While this evidence insinuates a reluctance to immunise, it needs to be emphasised that outbreaks were generally episodic and localised. Moreover, preventive strategies involving public health education had resulted in some success.[4] This background explained why municipal

reaction to diphtheria outbreaks was often impromptu and regional. In contrast, the Federal Treasurer, Dr E Page, used the national picture to justify immunisation: 'Of the 125 000 children born in Australia each year, 500 die of diphtheria before they pass school age'.[5] However, Bundaberg's regional councils appreciated the threat of diphtheria because in 1926, the disease had infected 130 Bundaberg and district people and had caused three deaths.[6] Another 89 cases were reported in 1927. The fiscal impost to Queensland's local government was significant because it subsidised public hospitalisation and, in the case of the Bundaberg City Council, provided quarantine facilities at the Bundaberg Showgrounds. Discharge was not allowed until three negative swabs had been recorded, which could take up to seven weeks to procure. Official estimates are vague but Godwin confirmed a direct cost to Bundaberg City Council for 1926 and 1927 of 'several thousand pounds'.[7] Moreover in early 1928, Queensland's major local authority, the Brisbane City Council, had recommended the regimen and a well-publicised United States study had revealed not only a growing acceptance of toxin-antitoxin immunisation but also a reduced mortality rate from 22.7 to 7.9 per 100 000 in immunised communities.[8] Within this context, immunisation against diphtheria was innovative but not experi-

Child being immunized against diphtheria in the 1920s.
(Picture Queensland Collection, State Library of Queensland)

mental. The measure made social, fiscal and medical sense and the Joint Health Board involving Bundaberg City, Woongarra Shire and Gooburrum Shire Councils, recommended immunisation for susceptible Bundaberg children. For all intensive purposes, it appeared to be a routine decision. Against this background, Bundaberg's Medical Officer of Health, Dr EG Thomson, sanctioned immunisation with a public assurance of 'positively no danger and no deleterious effects'.[9]

What happened?

Newspaper reports confirm that many parents welcomed the opportunity to have their children immunised. Dr Thomson started the inoculations on 17 January, 1928, which protocol involved three weekly administrations. Treatment continued uneventfully on 20, 21 and 24 January. By the last date, six children had been injected with their second vaccination. On Friday 27 January, 13 children received primary injections while eight children received their secondary inoculations. Within 24 hours 18 became ill. Eleven died during that time and another on the following day. Many died within hours of their admission to hospital. Their ages ranged from 23 months to seven years. The details of their deaths are recorded within the public domain and, suffice to say, many were not placid.[10] The programme included the doctor's son, who survived, and those of an alderman, Councillor CO Baker, whose two sons were immunised, both of whom died. Like Thomson, Baker had strongly endorsed immunisation 'at the Council table'.[11] Another family lost three children and another interred its two daughters while their two bothers lay seriously ill in hospital. *The Medical Journal of Australia* later editorialised, 'the subject is of immense importance to the whole community and particularly to the medical profession'.[12] This was an understatement as demonstrated by a poignant editorial in the *Bundaberg Daily News and Mail*. The editor wrote: 'Parents…have trusted their doctors and their civic authorities and they have been innocently penalised…The public will demand an investigation of the most searching kind'.[13] Within 24 hours of the initial newspaper reports, the expressions of grief were accompanied by demands for answers. However accountability was a complex domain.

The significance of the legislative precincts

The enduring and fragmented divisions in Australian health legislation and administration meant that responsibility for diphtheria treatment was obscure.[14] While health is a State responsibility the federal government has powers under the Constitution of human quarantine for international travellers via State-based Commonwealth Directors of Health. Under the *Quarantine Act* 1908 (Cwlth), federal powers in dealing with communi-

cable diseases were largely restricted to Australian non-endemic diseases like smallpox, plague, cholera, yellow fever, typhus and leprosy but 'state health departments were responsible for outbreaks of quarantinable diseases within their respective areas'.[15] Although the medical quarantine service became incorporated into the Commonwealth Department of Health in 1921, diphtheria was a communicable disease in a legislative nexus that embraced local authorities. The Queensland *Health Act* 1900 determined that local government had to provide hospital facilities for infectious patients if the State Commissioner for Public Health so ordered.[16] Hence an international boat-traveller who was a 'carrier' could trigger a regional epidemic and the State government could transfer costs of treatment to the local authority. However, in the Bundaberg incident, the use of the toxin-antitoxin inoculant firmly implicated the federal government. Not only had the Commonwealth Government, the Commonwealth Department of Health and the Commonwealth Serum Laboratories [CSL] recommended immunisation, but also the last had manufactured 30 bottles of toxin-antitoxin, known as *Batch 86*, one bottle of which was used in the Bundaberg inoculations. Moreover, the Commonwealth Department of Health had distributed some bottles of *Batch 86* to a State supplier, Medical and Surgical Requisites Limited. Furthermore, the State government, Bundaberg's Medical Officer of Health and the Joint Regional Health Board had endorsed immunisation against diphtheria, which was usually administered by the aforesaid medical officer at a room provided in the Bundaberg City Council's Chambers. Hence although the legislative milieu for diphtheria prevention and treatment was ambiguous, and by default a local authority responsibility, this incident embraced the three tiers of government and carried connotations beyond Bundaberg.

The immediate medical reaction

This sudden loss of young life was without local precedent. On Saturday afternoon, at an unspecified time after the first six deaths, the Medical Superintendent of the Bundaberg General Hospital, Dr I Hains, telegrammed the Home Secretary requesting the services of a pathologist 'by special train or aeroplane'.[17] Hains later informed the President of the Hospital, Bundaberg's Mayor (1927-1936), Alderman B McLean and the Senior

Bundaberg Base Hospital in 1924: Opened by the Governor of Queensland in 1914, a small cottage hospital was previously on this site from the 1880s.

(Picture Queensland Collection, State Library of Queensland)

Dr John Simeon Colebrook Elkington 1871-1955. An advocate of public health, amongst his achievements were the introduction of a system for checking the health of school children, development of a federal quarantine service and work with tropical medicine.

(Picture Queensland Collection, State Library of Queensland)

Sergeant of Bundaberg Police of the deaths and intimated that he was not prepared to sign death certificates. These were a requirement to initiate internment proceedings. That afternoon Alderman McLean took possession of the bottle of remaining serum and in the evening Dr Thomson sent dispatches by rail to the Federal Quarantine Officer, Dr John Elkington, and Queensland's Commissioner for Public Health, Dr JI Moore. The Maryborough Inspector of Police ordered the Government Medical Officer, Dr EG Schmidt, to perform *post-mortem* examinations. The Inspector of Police appreciated Schmidt's 'heavy responsibility' and suggested that 'the services of a pathologist be procured'.[18]

At this juncture, it is prudent to emphasise that the actions of the local medical professionals should be interpreted within the confines of contemporaneous knowledge and the extraordinary circumstances. Hains and Schmidt had appealed for expert assistance but both faced urgent and grave situations. Hains explained his predicament, that 'there were so many dying' and other children were seriously ill.[19] Although not in the official reports, Schmidt faced other problems: inadequate mortuary facilities and a concurrent heat wave in Bundaberg. Schmidt began the autopsies and continued throughout that evening and the next morning. He certified death from 'acute toxaemia' following injection of toxin and antitoxin mixture. At interview, he commented that the exact cause of toxaemia was a matter of surmise at that stage.[20] The *Bundaberg Daily News and Mail* reported Dr Schmidt's comments under the caption of 'Blood poisoned!', which terminology caused some discontent between the medical fraternity and the newspaper.[21] However the reality was that the Bundaberg General Hospital and St. Vincent's Hospital were confronted with multiple

paediatric emergencies: 12 fatalities, many of which occurred within six hours of admission; no immediate specialist assistance; and mortuary facilities and protocols that were inadequate for authoritatively handling an emergency of this nature. There was no pathologist until Dr Richards of the Commonwealth Health Laboratory in Rockhampton arrived by mail train on Monday 30 January 1928. The Director of Tropical Hygiene, Dr JA Murray, also arrived the same day but his role was not clinical but for administrative inquiry. Dr Richards' only autopsy was on a cadaver of over 52 hours 'during which time at the temperature of Bundaberg much *post-mortem* change must necessarily have occurred'. Moreover, Schmidt and Richards were isolated and lacked experience in this type of forensic analysis. This background and the contemporaneous difficulties with travel and communication explained later observations that 'many important possibilities which required immediate investigation were overlooked'.[22]

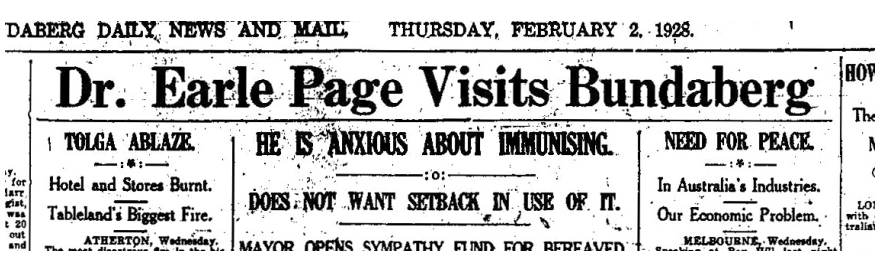
Knowledgeable medical opinion quickly emerged and agreed that the serum manufacture and immunisation *per se* were not the problems. Although not a medical practitioner, the experienced Public Analyst to the Bundaberg City Council, Mr J Christensen, made a prophetic statement, which the *Brisbane Courier* published on Tuesday 31 January.[23] He alluded to the bulk buying of the serum and its prolonged usage. He highlighted: the use of a multi-dose bottle; repeated puncturing of the rubber cover; blood-derived serum being a potential culture medium; and time for bacterial incubation with the multi-dose vial. Defending CSL, the serum and the science that produced it, Christensen advocated individual doses by commenting: 'We have economised by buying serum in bulk but we have spent dearly in precious lives'. The same edition of the *Brisbane Courier* carried the Commonwealth Director-General of Health, Dr Cumpston's strong assertion that the serum was of good quality when the Department issued it.

The Brisbane City Council and the British Medical Society of Australia (after 1959 the Australian Medical Association) dispatched Dr HW Tilling who arrived from Brisbane on the same day. Tilling made unspecified investigations that the commissioners later revealed were 'of considerable value'.[24] The Federal Minister for Health, Sir Neville Howse VC, directed the Federal Treasurer, the Hon. Dr (later Sir) Earle Page, to Bundaberg. Page arrived by rail from Sydney on the following day and not only strongly defended the principle of immunisation but also advocated its continuance.[25] Hence by the following Wednesday, Christensen, Cumpston, Elkington and Page had publicly acknowledged that prior inoculations from the same bottle had been uneventful and deduced that the 'serum itself had been quite all right up to that stage'.[26] Moreover, in

other published interviews, medical practitioners from local authorities at Rockhampton, Ipswich and Wondai in Queensland and in New South Wales and Victoria, who had also used *Batch 86*, confirmed that their programmes had been uneventful. While many of the aforementioned authorities expressed caution in attempting to ascertain what had actually happened, newspaper reports reveal an early medical consensus suggesting something untoward had happened to the serum either in dispatch or while in Bundaberg. Suspicions centred on the possibility of serological change or a problem with the inoculating protocol.

The immediate political and social reactions

Although the initial scientific debate involved some speculation, political reaction was swift. Immunisation programmes were immediately suspended in Queensland and the Premier, Mr William McCormack (ALP, 1923-1929) wired Alderman McLean and advised: 'Shocked to learn of appalling loss of life in your city. Please convey to parents Government's and my personal sympathy in their sad bereavement'.[27] However it was the federal government that assumed control. *Batch 86* was recalled. Like the CSL, the Commonwealth Department of Health defended the product and its status on dispatch from Melbourne. That being said, a former CSL director, Dr WJ Penfold, stated that it was inappropriate for the Laboratory to investigate its own product.[28] On the Tuesday, the day of the last Bundaberg funeral, the Federal Ministry invoked a Royal Commission with three medical experts: Dr CH Kellaway (Eliza Hall Institute); Professor P MacCallum (University of Melbourne); and Dr AH Tebbutt (University of Sydney). These appointments excluded the CSL from formal representation on the Royal Commission. The Prime Minister, the Hon. S Bruce (Nationalist Party, 1923-1929) further enhanced the Royal Commission's role by stating that inquiries would be 'speedy' and with an 'entirely free hand' and 'show no secrecy'.[29] Bruce's delegation of the Bundaberg visit to his coalition partner, Dr Earle Page and not the federal Minister for Health, was also astute. While Page's scientific expertise was not of the


DABERG DAILY NEWS AND MAIL, THURSDAY, FEBRUARY 2, 1928.

Dr. Earle Page Visits Bundaberg

TOLGA ABLAZE.
Hotel and Stores Burnt.
Tableland's Biggest Fire.
ATHERTON, Wednesday.

HE IS ANXIOUS ABOUT IMMUNISING.
DOES NOT WANT SETBACK IN USE OF IT.
MAYOR OPENS SYMPATHY FUND FOR BEREAVED

NEED FOR PEACE.
In Australia's Industries.
Our Economic Problem.
MELBOURNE, Wednesday.

Bundaberg Daily News and Mail, 2 February 1928, p. 5.

same calibre as the appointed commissioners, he was very familiar with diphtheria and immunisation and, with some justification, was portrayed in the media as a medical expert. Hence, the swift announcement of an imminent Royal Commission, its open terms of reference and Page's visit, engendered scientific and political confidence.

With respect to the immediate social impact of the tragedy on Bundaberg, photographs and the journalists' reports still told a story: closed businesses; flags at half-mast; hourly funeral processions; internments that extended into the evening; crowded footpaths with solemn observers; the mayor and aldermen as pallbearers; choirs and bands influenced by repeated performances; three small coffins into one grave; and 2000 at the railway station to dispatch two coffins to Stanthorpe. The *Brisbane Courier* reports that 'Bundaberg never passed through such a grief-stricken day'[30] and the *Bundaberg Daily News and Mail* labelled the 'loss of twelve fine little children' as 'Bundaberg's Gethsemane'. The latter paper added that the investigation of causes was Bundaberg's 'next duty'.[31] It editorialised:

> Immunization may do all that its advocates claim for it…Nevertheless however effective the serum may be, it is a filthy business based on a filthy foundation—that of injecting a disease-founded foreign body into the good clean blood of a healthy person…Advocates of inoculation, inventors and makers of serum, Ministers and officers of Health Departments have rushed to the defence of their laboratory baby…but Bundaberg will require more than that. Feeling 'had' by those it trusted in the immunization campaign, and with twelve child graves to keep it bitter, it will not be content with an academic controversy on sera among medical men…Twelve new graves in one day is argument enough for Bundaberg that something practicable has to be found. It is Bundaberg that has paid for this dreadful professional or departmental mistake, and the fact that it was an innocent or departmental mistake, does not lessen the payment extracted.[32]

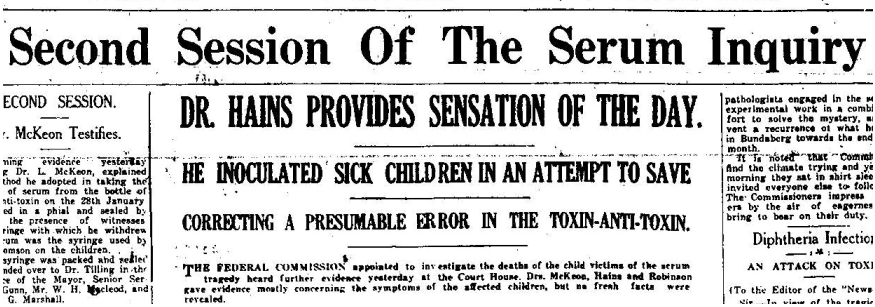
As would be expected, the *Bundaberg Daily News and Mail* carried speculation as to what happened. Claims involved: dust contamination; the wrong serum had been used; the rubber top on the bottle was defective; effects of the heat wave; anaphylaxis (acute allergic reaction); blood poisoning; tetanus; and horse-related disease from manufacture.[33] In spite of the aforementioned Prime Ministerial assurances, the editor and some of the public demanded an open inquiry.[34] For example, a New South Wales' correspondent submitted: 'This tragedy must be probed to the very depths and the blame sheeted home to the person or persons responsible...'. Furthermore, the Bundaberg Branch of the Australian Labor Party [ALP] 'wired' the Bundaberg parliamentarian, Mr G Barber (ALP, 1901-1935), calling for state intervention via two Queensland judicial appointees to the Royal Commission.[35] The action was futile and the rationale is unknown but

George Phillip Barber was born in 1863 in England. He was the M.L.A. for Bundaberg from 1901 to May 1935. He died on 7 November 1938 in Brisbane. Barber was also president of the Queensland Rugby League, 1918.
(Picture Queensland Collection, State Library of Queensland)

plausible explanations involved the abovementioned editorial, rumour or misgiving based on political differences between the Australian Labor Party and the Nationalist-Country federal government. While assessment of the Bundaberg Branch's motivation involves hypothesis, this evidence suggests that anger, suspicion and culpability were augmenting the initial expressions of grief. It was in the interest of all parties to institute swift action and the hearings of the Royal Commission began on Monday 13 February 1928. In just under a fortnight after the last internment, the commissioners were in Bundaberg taking evidence.

The royal commission

After three days of hearings at Bundaberg, the commission relocated for further sittings at Brisbane, Melbourne, Stanthorpe, Sydney and Toowoomba. In all, 36 witnesses appeared, which included three in New South Wales and 15 in Victoria.[36] Howse tabled *The Fatalities at Bundaberg – Report of the Royal Commission* (costing £4954) in the House of Representatives on 13 June 1928. Moreover, the commissioners, while acknowledging inadequacies in *post-mortem* procedure, were at pains to stress, 'the medical men at Bundaberg appear to have done all that was possible in the circumstances'.[37] The cause of the tragedy was specific. The commissioners concluded that all evidence pointed to the injection of living Staphylococci bacteria as the cause of the fatalities. However the matter of responsibility was far more complex. To avoid problems with low temperatures interfering with the inoculant (as had happened in 1924 in Massachusetts), the toxin-antitoxin mixture was made without antiseptic and initially stored in sealed glass ampoules to avoid reuse.[38] This was inconvenient in large immunisation programmes and rubber capped containers were introduced in late 1927. At that time,



BUNDABERG DAILY NEWS AND MAIL, WEDNESDAY, FEBRUARY 15, 1928.

Second Session Of The Serum Inquiry

ECOND SESSION.

. McKeon Testifies.

ning evidence yesterday g Dr. L. McKeon, explained thod he adopted in taking the of serum from the bottle of ti-toxin on the 28th January ed in a phial and sealed by the presence of witnesses ringe with which he withdrew um was the syringe used by omson on the children. syringe was packed and rede nded over to Dr. Tilling in the of the Mayor, Senior Ser Gunn, Mr. W. H. Macleod, and G. Marshall.

DR. HAINS PROVIDES SENSATION OF THE DAY.

HE INOCULATED SICK CHILDREN IN AN ATTEMPT TO SAVE

CORRECTING A PRESUMABLE ERROR IN THE TOXIN-ANTI-TOXIN.

THE FEDERAL COMMISSION appointed to investigate the deaths of the child victims of the serum tragedy heard further evidence yesterday at the Court House. Drs. McKeon, Hains and Robinson gave evidence mostly concerning the symptoms of the affected children, but no fresh facts were revealed.

pathologists engaged in the s experimental work in a combi fort to solve the mystery, a vent a recurrance of what h in Bundaberg towards the end month.

It is noted that Commi find the climate trying and ye morning they sat in shirt slee invited everyone else to follo The Commissioners impress ers by the air of eagerness bring to bear on their duty.

Diphtheria Infectio

AN ATTACK ON TOXI

(To the Editor of the "News

Bundaberg Daily News and Mail, 15 February 1928, p. 2.

Batch 86 was an emergency order of rubber capped bottles and had been issued in two lots. Because labels had not been printed, the first issue did not include warnings about the absence of an antiseptic and did not specify that its use had to be immediate. To further confuse matters, only some practitioners were advised accordingly; and typed notices were attached to some packages only applied by a rubber band. Dr Morgan, the Director of the Laboratories Division of the Commonwealth Department of Health wrote to Elkington to advise that the second issue of *Batch 86* did not have this warning, but the correspondence contained ambiguity and Elkington, with apparent justification, implied that future deliveries would contain the notice. As a precaution, Elkington advised distributors of *Batch 86* to circularise those identified as recipients by reference to relevant December accounts. Two suppliers received the advice, but Medical and Surgical Requisites Ltd, who supplied Dr Thomson, did not.[39] Therefore the calamity was partly due to a breakdown in communication.

While important as a contributing factor, this background did not explain the source of the contamination with the *'Bundaberg Staphylococcus'*, which was found in cultures from survivors' wounds and in the remnants of the inoculant. Two possibilities emerged. One was that Dr Thomson's fingers contacted the water which was used to remove the methylated spirits from the 'sterilised' needles. Another explanation was that the aspiration of the inoculant allowed ambient air in through the rubber cap via the puncture points. On available evidence, authoritative resolution of these matters was not possible. The findings were significant not only for the involved parties but also for the future of this public health measure. In abridged form, the commissioners concluded: the inoculations were responsible for the deaths and the illnesses; the toxin-antitoxin mixture was properly prepared and issued in a sterile form; the toxin-antitoxin mixture contained no antiseptic and was issued without instructions, which

was an unsound procedure; and the prior injections from the multi-use, rubber-capped bottle had contaminated the serum with a pathogenic *Staphylococcus*.[40]

The legacy of this tragedy was immediate and lasting changes to Australian immunisation protocol followed. The potential for biological products to incubate or store pathogenic organisms carried new ramifications for bottling, capping, storage, labelling and use. Rubber capped containers were not to be repeatedly employed unless antiseptics were present. Where antiseptics were not included, the bottle and packaging were to be conspicuously labelled as such and residual product was to be immediately discarded after use. Where possible, bottles were to be of clear glass to facilitate examination for turbidity. To lessen the chances of a diphtheria outbreak, the more stringent *Diphtheria Regulations* 1929 (Qld) were gazetted to include 'suspected patients', and the School Medical Service in the Department of Public Instruction swabbed '7,920 scholars attending 46 schools throughout the state'.[41] Little appeared in the annual reports and medical histories, which was partially understandable because this episode was technically a cross-infection incident and not a threat to the principle of immunisation *per se*.[42] Moreover, medical authorities were aware of a potential threat to immunisation *per se* as demonstrated by an editorial in *The Medical Journal of Australia* reminding the medical profession that it 'had a duty at this period of reassuring the public'.[43] However while the scientific basis behind immunisation had been vindicated and endorsed by the medical establishment and the *Brisbane Courier*, these scientific findings were distinct and separate from the sociological impact on Bundaberg and district.

Sociological impact

Newspapers carried graphic reports of the tragedy, the sociological impact of which continues to be largely unknown. Primary evidence was sparse because data on public opinion and associated operational variables was nonexistent. Retrospective sociological analysis must rely on tabloid reports and testimony in *The Fatalities at Bundaberg – Report of the Royal Commission*, which was reproduced in *The Medical Journal of Australia*. Scrutiny of both sources presents obvious confounding factors. The latter was a medical and not a behavioural inquiry. Its terms of reference meant that it was a sanitised source of information about community reaction. The experience of an immunised survivor, the now late Frank Baker, demonstrated the vagaries of reporting. In 1928, the *Bundaberg Daily News and Mail* reported that Baker 'suffered no ill effects (beyond an abscess)'.[44] In contrast, the *Bundaberg News-Mail*, with some authority, reported in 2002: 'Bundaberg man Frank Baker never fully recovered from

a tragedy that claimed the lives of 12 of the city's children early last century'.[45] Hence retrospective scrutiny of the societal impact of the tragedy must involve some conjecture.

Town view of Bundaberg, c. 1930.
(API-100-0001-0003 National Library of Australia)

Having made these concessions, evidence from Bundaberg confirmed that many residents now saw immunisation as an emotional and vexatious issue. Grief turned to suspicion and raised issues of culpability. The *Bundaberg Daily News and Mail* published details of evidence, including some of the *post-mortem* procedures. Episodic discontent manifested itself on the second day of the Bundaberg hearings. The editor of *Bundaberg Daily News and Mail* decried the first day's proceedings in that they only 'elicited and confirmed and re-confirmed that which Bundaberg knows too well – that twelve of its children are dead from toxaemia'. The paper took the position that the inquiry should provide answers 'if popular dread of immunisation is to be allayed and another disaster averted'.[46] Criticising the absence on the Commission of a lay advocate, who would seek 'information the people desire', the paper offered itself as the 'public's mouthpiece' and published a list of 18 questions to which it wanted answers. While the *Bundaberg Daily News and Mail* focused on important issues like the conditions of sale, presence or absence of an antiseptic, instructions for use, emergency treatment and the health prospects of the survivors, its first four questions inquired as to 'who failed?'[47] Moreover, after referring to the serum as 'this deadly substance', the paper highlighted the difference of witnesses' opinion over the role of the vial's rubber cap, and then asked: '… are all right, all wrong or does it go by majority vote?' Clearly, at the hearings in Bundaberg, culpability was now an element in unquantified community dissatisfaction with the Royal Commission. Of course, this was not the role of the Commission, which was created to establish the cause of the tragedy. Later parliamentary debates confirm that a parliamentarian had been approached for 'compensation'.[48] Whether the Commission's lucid findings on aetiology satisfied the local community and the editor

of the *Bundaberg Daily News and Mail* is a moot point. The question of responsibility was obscure because it implicated: inadequate labelling; communication break down; Dr Thomson's injection protocol; ambient air contamination; and the purchase of bulk serum. There was no evidence relating to civil action. In a cautious editorial that highlights 'the need for the most scrupulous care on the part of doctors and laboratories', the *Brisbane Courier* asserts that 'Our children must be protected ... the medical profession is practically agreed on the value of immunisation'. Hence, the principle of immunisation itself had been exonerated.

It would be naïve to suggest that there were no sociological sequelae. The Bundaberg City Council did not conduct diphtheria campaigns until after World War II. Twenty years later, during 1948 and 1949, some parents continued to spurn the campaign. While there is conflicting evidence about the extent of the sociological impact, a council employee from 1945 to 1992, T Healy, succinctly commented: 'the memory lingers'.[49] Healy cited the mid-1950s as the era of restored confidence. The absence of behavioural investigation means that potential explanations must involve supposition. While time and faded memories were plausible reasons, there were other considerations: the 1954 resurgence of polio with the imminent prospect of the Salk vaccine; the emergence of triple antigen; community concerns about tuberculosis infectivity; and the Queensland Health Education Council's campaigns.[50] While the Bundaberg Branch of the Australian Vaccination Network demonstrates that pockets of opposition to immunisation remain in Bundaberg, evidence suggests its underlying philosophies represent libertarianism and alternative health regimens.[51] Indeed the very success of immunisation could be another factor in that the high prevalence and severity of symptoms of the various 'childhood' epidemics seems a distant memory. Having said that, tangible affirmation of Healy's reference to lingering memories episodically surfaces. A *Bundaberg News-Mail* interview with an affected relative cites a 'botched vaccination program' and implicates aetiological factors like the 'purchase price of the serum' and the 'cost of injection'.[52] To some of Bundaberg's senior residents, the 1928 incident is not forgotten. Furthermore, the noticeable and common occurrence of a small scar on the throat of Bundaberg's senior citizens is testament to a generation that preferred the risk of diphtheria, quarantine and tracheostomy rather than of immunisation.

The positive

As often happens, out of human despair comes scientific advance. Commissioner Kellaway was a director of the Walter and Eliza Hall Institute of Medical Research where Dr (later Sir) Frank Macfarlane

Burnet, as an assistant director, had recently returned from London with a Doctorate of Philosophy in bacteriology.[53] Kellaway recognised Burnet's potential 'in the advancement of world science' and 'deputed Burnet to conduct the necessary laboratory investigations' for the Commission.[54] The Bundaberg tragedy impacted on Burnet, who was emerging as a prolific and eminent researcher who 'found himself taking a more serious approach to antibody production.' Burnet quickly isolated Staphylococcus aureus in both the administered toxin-antitoxin mixture and from pus from survivors. However Burnet was fascinated by the apparent metamorphosis of common skin bacteria into virulent pathogens and the survival of some inoculated victims.[55] Ensuing investigations gave Burnet an insight into the importance of the role of the host body and its susceptibility to infectious disease and provided an example of the way a relatively harmless bacterium could be responsible for fatal infections.[56] Burnet published findings on staphylococcal toxins and antibody response, which later evolved into the 'clonal selection theory'.[57] The latter related to the nature and kinetics of primary and secondary antibody responses, and according to author, Ian Mackay, this interest opened Burnet's 'road to Stockholm,' where he was awarded the 1960 Nobel Prize in Medicine for his work on immune tolerance.[58] Hence, the Bundaberg incident had indirectly contributed to the evolving field of immunology, which would impact heavily on the medical sciences, for the benefit of the world.

One unanswered question relates to the fate of Dr Thomson, who continued to reside in Bundaberg for several years. Not without supporters, rumour has it that he personally struggled with events. After his departure from Bundaberg, Dr Thomson disappeared into the mists of time. The Commonwealth Government offered £100 to parents and guardians of the deceased and paid the 'medical, nursing and other expenses' of the surviving children.[59] Perhaps the concluding observation is best left to Mr and Mrs CO Baker's inscription on the Stanthorpe gravestone of their two sons Edward and Keith: 'Thy purpose Lord we cannot see – But all is well that's done by thee'.[60]

Endnotes

1 'Serum tragedy', *Brisbane Courier*, 14 June 1928, p. 12.

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