

INFECTIOUS DISEASE IN CHILDHOOD IN TWO MINING TOWNS IN NORTH WEST TASMANIA IN THE LATE NINETEENTH AND EARLY TWENTIETH CENTURY**Peter Stride***

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Article Received on 06/04/2024

Article Revised on 27/04/2024

Article Accepted on 17/05/2024

ABSTRACT

The discovery of tin in northwest Tasmania precipitated a flood of miners into the area, followed shortly, inevitably by their families. Paediatrics became part of the local doctors' practice and communicable diseases were common. Childhood infectious diseases in the mining towns of Waratah and Zeehan in north-west Tasmania as documented in the local newspapers a century ago are described. The challenges of working in such a remote environment and the diverse skills expected of a medical practitioner in a situation similar to today's remote general practice are outlined.

KEYWORDS: Tasmania, Mining, Paediatric infections, 19th century, Zeehan, Waratah.**INTRODUCTION**

The towns of Zeehan and Waratah in Northwest Tasmania are less than fifty kilometres apart. Both were the home of families during the mining eras beginning in the late nineteenth century and thrived vigorously for over fifty years.

Inevitably a considerable proportion of the medical work load involved caring for children with infectious diseases. The incidence of infectious diseases is of particular relevance today when the anti-scientific evidence and anti-vaccination movement is causing a substantial increase in the frequency of vaccine preventable or optional diseases.

Most details relating to the Zeehan and Waratah Hospitals are obtained from the archives of the Zeehan and Dundas Herald and other Tasmanian newspapers digitised on the National Libraries of Australia Trove website. Clearly this is not a peer-reviewed publication, but it is probably the best available source of information. This treatise is essentially related to the clinical details, while administrative, financial and political events are largely omitted.

Unfortunately press releases from the hospital board came from small business men as medical and nursing

experts were not usually included in committee meetings, hence the deficiency of expert opinions and clinical details.

HISTORY

The Waratah and Zeehan area was first colonised some forty thousand years ago by the Peerapper and Tommeginne Indigenous people. In 1642, the intrepid Dutch explorer and brilliant navigator, Abel Tasman, sighted and named Mount Zeehan after the brig *Zeehan* in which he was sailing. Bass and Flinders in their circumnavigation of Tasmania in 1802, confirmed the name of Mount Zeehan and named the nearby Mount Heemskirk after Tasman's second ship.

Tin was discovered near Waratah at Mount Bishoff in 1871 and at Mount Heemskirk near Zeehan in 1879. Mining commenced almost immediately and the two towns grew rapidly. Miners and prospectors arrived first followed by families and the whole infrastructure and workforce of an independent township.

Waratah had a doctor by 1876 and a hospital in 1881. Zeehan's first doctor was in town by 1891 and the first permanent hospital opened in 1894.



Figure 1: Waratah Town and Waterfall.



Figure 2 Bischoff Hotel 2022.

Infectious diseases

Infectious diseases shortly before the antibiotic era and in the early days of vaccine development were predictably common with a significant morbidity and mortality in all age groups. Public concern and Public Health involvement inevitably occurred. Diagnosis then depended imprecisely upon clinical features and current local epidemics. Bacteriology was in its infancy and virology and serology were yet to be developed.

Diphtheria and Typhoid were the major recurrent infections in the mining communities of North-West Tasmania with epidemics, hospitalisations and deaths. Unfortunately, the press releases from hospital administrations gave few clinical details and gave total numbers of cases without distinguishing young and old.

Therefore this segment relates total number of cases across all age groups.

Chicken Pox

Although common, Chicken Pox only appears once in press releases in the time and place described. It has a low mortality in children, about one per hundred thousand cases, though as many as twenty five per hundred thousand cases in adults.^[1]

The state school teacher was patient zero in the only documented outbreak of Chicken Pox at Guildford Junction twenty five kilometres from Waratah, causing problems with isolation and spread of the infection. The school was closed for a period on the recommendation of Dr. Montgomery as the local health officer.^[2]

Diphtheria

Diphtheria is a highly contagious and potentially life-threatening bacterial disease caused by *Corynebacterium diphtheriae*. It was once among the top-ten causes of child death causing respiratory insufficiency due to airway obstruction, especially in infants. The overall case-fatality rate for diphtheria in the pre-antibiotic, pre-vaccine era was 5%–10%, with higher death rates (up to 20%) among persons younger than five and older than forty years of age.

During the 1920s, 13,000 to 15,000 deaths from diphtheria were reported each year in USA. There were more than 4,000 deaths from diphtheria in Australia between 1926 and 1935.

Although a diphtheria antitoxin serum was first used in the nineteenth century with benefit, diphtheria toxoid was developed in the early 1920s but was not widely used until the early 1930s when diphtheria cases fell dramatically. Between 1999 and 2019, eight cases of respiratory diphtheria were reported in Australia. (0.002 per 100,000 population per year).

Unfortunately respiratory diphtheria recurred in Australia in 2022 when an unvaccinated toddler from the far north coast of New South Wales required admission to an intensive care with respiratory diphtheria, the first case since 1992. A six-year-old close family contact was also infected. Diphtheria is now becoming more common in the current anti-scientific evidence, anti-vaccine era, another optional disease.

In 1885 there were eight cases of diphtheria^[3] under the medical officer, Dr. Kennedy, in Waratah.

There was an anti-vaxxer movement as far back as 1897 and the Central Board of Health modified the compulsory clauses to promote universal vaccination to preventive small-pox. There appears little improvement in common sense and informed opinion in over a century!

In 1887 there were one hundred and fifty cases of diphtheria notified, and twelve deaths registered attributed to it, as compared with one hundred and fourteen cases with thirteen deaths in 1896. The Board noted that notwithstanding the greatly increased number of cases the number of deaths was smaller.

Between 1894 and 1897 the death-rate from diphtheria continuously and rapidly decreased from 19.8 per cent of cases in 1894, through 16.8 per cent in 1895, and 11.9 per cent. in 1896, to 8.0 per cent. in 1897. As this decrease in mortality is coincident with the increase in use of antitoxin serum, the board could not but regard this as the cause and effect.^[4]

Three cases of diphtheria, two in one household, were reported by Dr. Montgomery as the medical officer at

Waratah. Stringent measures were adopted to suppress the disease, but as a great many people had been away during the holidays, the Mercury considered there may be more cases reported before long.^[5]

Francis Davis, a boy from Hatfield in the Waratah municipality, died in the Zeehan Hospital from diphtheria according to the medical superintendent. Great care was taken in isolating and disinfecting the ward.^[6]

An outbreak of diphtheria occurred in Zeehan in May 1913. The Medical Officer also reported that the diphtheria outbreak commenced on April 21st and that there had been eight cases to date, six in the one household which had been totally isolated. The drains were examined, cleaned, carbolicised and fenced to prevent cattle carrying the infection into the dairies. The three school children had not attended school for ten days or more. Schools were cleaned and disinfected. Two patients were swabbed with one being positive for diphtheria and one being inconclusive.

Vaccination for diphtheria was not available till 1920. The mortality varied from 5-20% depending on age a century ago before antibiotics. The disease is sadly, predictably being seen again in the antivaccination era.^[7]

An outbreak of diphtheria occurred in the town. The first two cases were reported four weeks ago and it was hoped the occurrence was past, however, last week several more cases were reported. Steps were taken to have the affected families isolated and on the request of Dr Driscoll, the old hospital was converted into an isolation unit. Two wards were equipped and the patients moved into them on the following day.^[8]

Sister Davies reported that twenty nine children had been immunised against diphtheria.^[9]

Hydatid disease.

Echinococcosis is a parasitic disease caused by tapeworms of the Echinococcus type. Adult *E. granulosus* tapeworms infect dogs and other canines, and the tapeworm eggs are shed in faeces of these infected animals. People become infected by ingesting (swallowing) the eggs. This can occur via hand-to-mouth transfer after handling dogs or objects contaminated with the eggs, or from consuming contaminated food or water.

Following control programs, greatly benefited by the absence of dingoes, hydatid disease has not been seen in humans in Tasmania since 1970 Dr Panting performed a post-mortem examination on the body of the fourteen year-old boy, Thomas Leonard Fahey, son of William Fahey who expired suddenly, when seized with a fit of coughing. He was supposedly ill from a cold, and a cough.

Panting announced to the coronial enquiry that he found the body to be that of a well-nourished young male

fourteen years of age with no external marks of violence. Only one lung was found to be present, that on the right side being represented by a fibrous root. Its place was occupied by a large unilocular hydatid cyst filled with a glairy fluid which was frothy. Similar fluid was found blocking the air passages and mouth.

Panting considered that death use due to the rupture of this cyst and consequent asphyxiation and the coroner agreed. Presumably, considering his normal development to the age of fourteen, a normal right lung had become infected with hydatid rather than a maldeveloped cystic lung developing secondary infection with hydatid though that is not clear.^[10-11]

Influenza

Published Tasmanian State Health report for 1887 revealed twenty eight deaths from influenza.^[4]

The 1918–19 influenza virus is often called 'Spanish flu' because it was widely reported in Spain before other countries. There was no wartime censorship in neutral Spain. The pandemic started in 1918, most likely in the United States, and passed through soldiers in Western Europe in successively more virulent waves, finally reaching Tasmania in late 1919.

The influenza epidemic was now rampant across Tasmania. Dr Panting as Local Health Officer inspected incoming trains, though travellers were few and mostly wearing masks unless the only occupant of a carriage. Two travellers not wearing masks were taken by the police for further questioning, an interesting comparison with the current Covid era.

One visitor from Linda was detained in the Zeehan Hospital for testing. One patient in Zeehan Hospital with influenza had recovered sufficiently to be discharged and the other inpatients were reported to be recovering. Two other patients with influenza, isolating in town were also recovering.^[12]

Mr Grimshaw died in the Zeehan Hospital one day after developing influenza associated pneumonia. One mild case was admitted, one was about to be discharged and the other influenza inpatients were recovering. The citizens of Zeehan were genuinely concerned about people from Strahan with influenza passing through Zeehan and sought some form of lockdown.^[13]

Dr Panting reported the admission of two patients to Zeehan Hospital with mild influenza, no complications were detected. The other inpatients with influenza were convalescent except one with secondary pneumonia.^[14] Influenza had become very prevalent in Waratah, the Spanish 'Flu had presumably arrived. Dr Heyer was still unwell presumably with the 'flu and Dr J Collins had arrived from Melbourne as locum tenens to the great relief of the town. A trained nurse had also been

stationed at Magnet. This was the final mention of influenza in the local press.^[15]

Measles

Measles was very common in Australia before measles vaccination was added to the childhood immunisation schedule in the mid-1970s. In 2014, Australia was declared measles free. A measles outbreak occurred in Samoa in 2019 in which there were over five thousand, seven hundred cases and eighty three deaths. The cause of the outbreak was attributed to decreased vaccination rates there, from 74% in 2017 to 31–34% in 2018.

Published Tasmanian State Health report for 1887 revealed three cases of measles.^[4]

Meningitis

Although lumbar punctures were first performed and described by Dr Walter Essex Wynter at the Middlesex Hospital in 1891, there is no evidence of the procedure being performed in the cases reported below hence the diagnosis is not confirmed and the infecting organism unknown.

Miss Revt, youngest child of Mr Thornton Revt, sub-overseer at the Mount Bischoff Mine died at Waratah from 'brain fever,' after a short but painful illness. The deceased was attended by Dr. Brewis, assisted by Dr. Smith, who did all that earthly aid could do. Bacterial meningitis appears the likely diagnosis.

The infant child of Mr and Mrs F. Connors, Renison Bell, died in the Zeehan Hospital after appearing to survive the crisis of pneumonia only to succumb fairly suddenly to meningitis.^[16]

Mumps

Mumps is a relatively mild contagious viral illness with an overall case-fatality rate of about 2 people per 10,000, in those who develop encephalitis. Mumps can cause serious complications including hearing loss and infertility.

Dr Faulkner was reported to be haying a busy time during the wintry weather with frequent colds and an outbreak of mumps.^[17]

Pneumonia

Lobar pneumonia had a mortality of 20-25% prior to antibiotics as occurred in the Zeehan and Waratah Hospitals. Most cases were caused by Streptococcus pneumoniae and Staphylococcus. An early article describing the clinical features and progress was written by the eminent Russian physician, Dr Anton Chekhov.

The admissions to Zeehan Hospital in February included seventeen patients with pneumonia, four secondary to typhoid.^[18]

Eva Chandler, a girl from the Magnet, was admitted to the Waratah Hospital severely ill with pneumonia. There were no further press reports on her progress.^[19]

Forty-one cases of pneumonia were admitted to the Zeehan Hospital of whom five died, two being moribund on admission. This compared very favourably with Broken Hill Hospital which had an eighty percent mortality, and the national average mortality of fifty percent. The chairman could not identify any other hospital with so low a mortality.

The reason for this low mortality is a matter for conjecture. As doctors and nurses it is easy to accept the suggestion of clinical brilliance, but other causes are more likely in the era before diagnostic bacteriology, serology for infectious diseases, intravenous fluids and antibiotics. Presumably, the cases of pneumonia were confirmed by radiology, though they may have been primary viral disease rather than pneumococcal disease.^[20]

The son of Mr W. Cameron was admitted to the Zeehan Hospital with pneumonia.^[21]

Three deaths with pneumonia were reported. Dr Montgomery worked then in an inadequately constructed hospital with no operating theatre and no isolation ward.^[22]

Gwendolin Harris, aged ten, the daughter of Mr and Mrs C.P. Harris, died in Zeehan Hospital from pneumonia, a reminder that in the pre-antibiotic days death from pneumonia was tragically not limited to the elderly and infirm.^[23]

Jean Folder, the little daughter of Mr. and Mrs. W. Folder, was admitted to the Waratah Hospital suffering from pneumonia and was progressing well.^[24]

Mr J. H. Oakley, one of the sons of Mr and Mrs B. Oakley of Waratah, was admitted to the Waratah Hospital seriously ill with bilateral pneumonia.^[25]

Scarlet Fever

Scarlet fever or scarlatina is a bacterial illness that may follow a streptococcal throat, most commonly in children five to fifteen years of age. Clinical features are a bright red rash that covers most of the body, a sore throat, lymphadenopathy and high fever. Untreated, scarlet fever can result in rheumatic fever, chorea or glomerulonephritis. In the 1800s, epidemics of scarlet fever were common. It was a leading cause of death in children with a mortality rate up to fifteen to twenty percent.

Today scarlet fever is less serious thanks to antibiotic therapy, improved public hygiene and public health and diminished bacterial virulence. However resistance to

antibiotics has emerged in the last decade, unsurprisingly from China.

Published Tasmanian State Health report for 1887 revealed two hundred and three cases of Scarlatina with five deaths.^[4]

A meeting of the central Board of Health noted that the fever wards of Hobart and Launceston Hospitals were empty. Two cases of scarlatina or scarlet fever were noted in Hobart. The index case was their father who had been in Zeehan Hospital having surgery following an accident at work, who then returned to Hobart. Apparently, he was not isolated in hospital despite signs and symptoms. Apparently the new hospital secretary was unaware that scarlet fever was a communicable disease despite an outbreak in Zeehan! Hopefully, he was not in a position to make important decisions controlling the outbreak.

The children were isolated till they recovered, the house was cleaned and there was no further transmission.^[26]

An outbreak of the highly infectious and potentially fatal diseases of scarlatina and diphtheria occurred in Zeehan in May 1913. The Medical Officer of health reported the current epidemic of scarlet fever began on April 2nd, and there had been twenty-six cases by mid-May. Eleven were school children and three of these had not attended school for ten days or more. Houses were fumigated and drains were cleaned and carbolised. The M.O. considered this outbreak to be in a very mild form.^[27]

Cases were isolated at home and advised not to mix in public or attend school for six weeks. Houses were fumigated and drains were cleaned and carbolised. The M.O. considered this outbreak to be in a very mild form.

Dr. Faulkner was extremely busy with a Scarlatina epidemic affecting school children and several adults. Closing the State School seemed only to have the effect of spreading the disease as the children were mixing more with their playfellows outside the school! The Mercury considered that institution could no longer be blamed for spreading the infection.

The Herald reported what it considered a remarkable case. Fortunately, the press for once gave the detailed clinical features reported by the sufferer which enable us to make a retrospective diagnosis.

Miss Bertha Columbine, aged fifteen, became unwell with an attack of scarlatina followed by erysipelas which seemed to ruin her whole health. A few months previously, following that Streptococcal infection, she was a nervous wreck with apparently no chance of recovery. Often she was so violent that she had to be tied hand and foot. The worst feature was that at one time she lost all power of speech.

Her legs, arms and fingers started to twitch and jerk, and she could not keep them still. She could not hold anything in her hand and had to be fed like a baby. She could not walk and sharp pains shot through her my legs. Often she cried with the pain though she could not speak a word. Sometimes she would lie like dead, and other times it. would take two strong men to hold her or tie her down. Dr. W. Faulkner considered she was the worst case of the kind that he had ever seen.

After some weeks she took some of Dr. Williams' Pink Pills from Mr McCreery, the Chemist. Shortly her speech returned, her twitching ceased and her nerves recovered. Bertha was convinced the pills had cured her. Miss Columbine said, *'Now you would not find a healthier or happier girl than I am.'*

Perhaps she was just making the normal slow recovery from Sydenham's chorea. A condition, first described by the English physician Thomas Sydenham in 1686, like her initial scarlet fever, caused by Group A Streptococci.^[28,29]

An outbreak of the highly infectious and potentially fatal diseases of scarlatina and diphtheria occurred in Zeehan in May 1913.

Smallpox

A year after the 1906 Zeehan typhoid outbreak, Dr John Elkington, the chief public health officer, produced a scathing report on this and other medical issues. Elkington, a Victorian born in 1871, failed his medical exams at the University of Melbourne, but subsequently graduated from Edinburgh and Glasgow. In 1903 he was asked to return to Launceston to assist with an outbreak of smallpox where he naturally recommended mass vaccination. Subsequently he became Queensland and Australian Quarantine Officer establishing a number of laboratories in Australia and Rabaul to deal with infectious epidemic diseases. He died in Mooloolaba in 1955.^[30]

Smallpox was declared eradicated from the world in 1980 following a unique global campaign of cooperation and vaccination that cost around the price of one nuclear submarine.

Tuberculosis

Published Tasmanian State Health report for 1887 revealed one hundred and thirty five deaths from phthisis (tuberculosis). TB is not mentioned again.^[4]

Typhoid

Typhoid was a major health problem in the two towns with frequent outbreaks in spite of abundant rainfall and fresh water. The Typhoid bacillus was first detected and identified in 1880 by Karl Eberth and confirmed as the cause of the disease by Georg Gaffky in 1884, but it is considered to have been the cause of many past outbreaks of infection with associated high mortality, for

example the Athenian plague of 430BC, which killed a third of the population including Pericles and the disease which wiped out the English settlement of Jamestown, Virginia, USA in the early 17th century. It is thought to have caused the death of over 80,000 soldiers in the American Civil War.

The association of typhoid with poor sanitation and disposal of sewage was well known by the 1890's. Patrick Manson in his text 'Tropical Diseases' notes the frequency of the disease in Europeans soon after arrival in unsanitary places in Asia, particularly from drinking contaminated water. He writes:-'Similar testimony has come from Australia, where typhoid has occurred in the back country in lonely spots, hundreds of miles from fixed human habitation'. In Kalgoorlie Hospital, Western Australia in 1890 up to 70% of inpatients had typhoid with a mortality just under 20%

William Osler was the leading global medical authority in the late nineteenth century. His text 'The Principles and Practice of Medicine' describes the diagnosis and management of typhoid at that time. He considered that *'In cities the prevalence of typhoid fever is directly proportionate to the inefficiency of the drainage and the water supply'* and noted that the mortality varied from 10-30% in different outbreaks. He believed contemporary medications were of little use.

Diagnosis of typhoid would have depended upon clinical features in the early days of bacteriology and before serology. Pathology is not mentioned in committee press releases. The history of a pre-febrile phase with headache, malaise, bronchitis and anorexia, followed by a febrile illness with diarrhoea was strongly suggestive of typhoid. Rose-coloured spots found in 5-30% of cases and splenomegaly were key features on examination.^[31]

A meeting of the central Board of Health noted that the fever wards of Hobart and Launceston Hospitals were empty and that there had been no deaths from typhoid in Tasmania for a month.

There were epidemics of infectious diseases, though precise numbers are elusive. Are twenty patients in hospital one month and thirty the next the same patients or different ones? Not all cases are admitted, some mild cases of typhoid, diphtheria and scarlet fever were isolated at home. However it appears there were fifty-eight cases of typhoid during the epidemic in Zeehan with only three deaths, followed by three subsequent isolated cases, one of whom died.

An editorial in the Herald reported that there were six cases of typhoid fever in the Zeehan Hospital, and an undisclosed number receiving treatment at home. A week later the Mercury reported that one patient had died from typhoid. A further two days later it was reported that there were nine cases in hospital. It notes some unsanitary premises in town where kitchen refuse rots on

site, and where dirty water is thrown out back doors to run through open drains that are not flushed or disinfected. The Herald considers that Zeehan with a congested population and no sewerage system is ripe for a more severe outbreak of typhoid.

It cites Beaconsfield where acquisition of money superseded hygiene such that there were just under a hundred cases of typhoid the previous year. It cites the domestic rainwater tanks which would not only trap rainwater, but also pollution from dust and dirt, and metals from the mines. Boiling was recommended as a standard safety measure.

The Herald also recommended tuberculin testing for cattle to eliminate the disease from local herds and reduce bovine tuberculosis in the community.^[32,33,34]

The epidemic of typhoid escalated, another day later there were a total of eighteen cases in Zeehan Hospital of whom ten had typhoid, and another death from typhoid was recorded. Two weeks later there were twenty inpatients, over half of whom had typhoid.^[35,36,37]

Statistics for Zeehan for the month of August were twenty-six births and five deaths, an indication of the number of young families now in town. The hospital was estimated to be serving a population of ten to twelve thousand. The Zeehan Hospital figure for the same month were ten admissions, ten discharges, one death and ten remaining. It was reported that Queenstown hospital was unable to isolate patients with typhoid and one of their nurse had recently died of typhoid.^[38,39]

Impure water supplies and insanitary human waste disposal lead to frequent outbreaks of infections such as typhoid. Improving standards, training of nursing staff and the 1918 Registration of Hospitals Act saw slow improvement.

The following week there were six patients with typhoid in Zeehan Hospital amongst the sixteen admissions.^[40]

Four days later, the Mercury noted there were twenty-three patients in Zeehan Hospital, four of whom had typhoid.^[41]

The admissions to Zeehan Hospital in February included seventeen patients with pneumonia, four secondary to typhoid.^[42]

Dr Butler, the house surgeon at the Zeehan Hospital vaccinated seventy-one people in two days. The nature of the vaccine is not recorded. Available vaccines by 1903 included smallpox, cholera, rabies, tetanus, typhoid fever and bubonic plague, typhoid would perhaps seem the most likely in view of the incidence in Zeehan. Butler was reappointed as medical superintendent for another year at the monthly board meeting.^[43,44]

Roseberry has an outbreak of typhoid and several cases required admission to Zeehan Hospital.^[45]

The typhoid outbreak became more severe with the Medical Superintendent reporting twenty admissions with typhoid during the month, but no deaths. Nineteen inpatients were present on May 8th, twenty were admitted, twenty-three were discharged, there were no deaths leaving sixteen inpatients on June 12th. There had been seven hundred and thirty-one consultations and nine hundred and eighty-eight prescriptions.^[46,47]

In July there were fifteen inpatients with typhoid and eight with pneumonia. One hundred and twenty-five patients had been admitted to Zeehan Hospital in the previous half year with only one death. A commendable figure in a typhoid outbreak.^[48]

By August there were twenty-five typhoid cases in the Zeehan Hospital, though none were admitted the day prior to publication. Two days later three patients with typhoid were admitted in one day.^[49,50]

Two weeks later Dr Butler reported there were thirty-one patients in hospital, still twenty-three with typhoid. There was a total of thirty-seven cases of typhoid in town and the hospital was seeking a house to function as a convalescent ward. Dr Butler had made one thousand, four hundred and twenty-five consultations and one thousand, two hundred and thirteen prescriptions were dispensed.^[51]

Another epidemic of typhoid occurred. Fifty-eight cases were admitted with three deaths, a mortality of just over five percent, which compares very favourably with for example Kalgoorlie at the same time with a seventeen percent mortality.^[31]

Typhoid was a clinical diagnosis of limited accuracy prompted by fever, rose red spots and splenomegaly.^[52] Zeehan with an abundant fresh water supply may have had lower bacterial loads than Kalgoorlie in an arid zone and the percent of correct diagnoses is anyone's guess.

A year after the 1906 Zeehan typhoid outbreak, Dr John Elkington, the chief public health officer, produced a scathing report on this and other medical issues. Elkington, a Victorian born in 1871, failed his medical exams at the University of Melbourne, but subsequently graduated from Edinburgh and Glasgow. In 1903 he was asked to return to Launceston to assist with an outbreak of smallpox where he naturally recommended mass vaccination. Subsequently he became Queensland and Australian Quarantine Officer establishing a number of laboratories in Australia and Rabaul to deal with infectious epidemic diseases. He died in Mooloolaba in 1955. Elkington's report commenced with stating that *"The smaller local authorities remain for the most part in a condition of almost primeval insanitation, three and a half years of careful observation have forced me to the*

conclusion that in the great majority of rural districts, and in not a few of the larger towns, local sanitary administration is a mere pretence, and a farcical waste of the little money devoted to it. These communities live in a fool's paradise so far as any real protection from disease outbreaks is concerned. It is only too apparent that in certain cases this is due to the disinclination of a small but influential local class to pay for works done for the advantage of those whose sanitary interests they are actually appointed to safeguard.

Unless the new local bodies which will come into being under the Local Government Act can be induced to handle this matter of protection of the public from unnecessary and dangerous disease with much greater earnestness and skill than their predecessors have brought to bear on it, it will be only a matter of time before some epidemic disaster will force on the question of removing altogether from their hands the local administration of so important and technical a statute as the Public Health Act."

Elkington noted that local doctors were paid little for public health duties and were hesitant to antagonise the more wealthy and influential community leaders for whom profit is more important than community needs. Elkington and the newspaper editorials hoped that government action would ensure public safety was elevated to become the major concern.

The 1906 typhoid outbreak in Zeehan was traced to infected milk and the three-year-old daughter of a local milkman. She had been in hospital for five weeks with accidental burns at the same time as a case of typhoid. Shortly after discharge she had an unrecognised subclinical attack of typhoid and probably infected five of her siblings and her mother who was actively involved in milk preparation and marketing.

Forty-one of the one hundred and fifty-five households supplied by the dairy developed one or more cases of typhoid. Hospital precautions to prevent the spread of typhoid were almost non-existent. Bedpans was scalded once daily only and that only one third strength disinfectant was used. Urine from typhoid sufferers and bedpan washings ran into a defective hospital drain and thence into an open gutter where children were seen playing and making mud pies.

The local authorities in Zeehan confessed they were fearful to invoke the limited powers of the 1903 Public Health Act for fear of conflict with the wealthy influential or litigious businessmen in town. It appears the dairy was not closed down for a period.^[53,54] Another example of finance driving policy ahead of the average citizens health requirements. The Hospital Board's self-congratulations for dealing with the pandemic appear premature and erroneous.

A case of enteric fever or typhoid was admitted to Zeehan Hospital from Tullah.^[55]

Miscellaneous

Herbert Lawler, the son of Mr and Mrs W.J. Lawler of East Devonport was admitted to the Zeehan Hospital with blood poisoning or bacteraemia. The site of primary infection was not reported.^[56]

April figures for Zeehan from the Registrar-General of births and deaths were twelve births and seven deaths. Including Lyell and Strahan there was an area excess of births over deaths of twenty-three. Dr Butler was relieved during his holiday by Dr W.R. Graham whose attention had been much appreciated.^[57]

Victor Roy Ramsdale, aged seven weeks was admitted to the Zeehan Hospital under the care of Dr Panting and died four days later to be the subject of a post-mortem examination and coronial enquiry. The prior history was of a normal delivery of a healthy boy, a fourth child to the Ramsdales, followed by the development of chafing of the legs, progressing to severe infected ulcerating dermatitis extending from the knees to the rectum, intermittent constipation, wasting and weight loss and convulsions.

Evidence was given by the child's parents, the hospital matron and nurse, the young lady employed as assistant by the family and Panting. Victor was treated with regular washing and topical olive oil and powders for constipation. There was delay in the mother seeking medical advice as she had been erroneously informed that Dr Panting would not see Victor as he had not attended the confinement.

Dr Panting's autopsy found no evidence of any internal disease, the intestines were normal with a partially digested meal detected. He was of the opinion that 'death was due to a marasmic condition brought on by septic absorption from the large, ulcerated surface on the body,' and the coroner agreed.

Coexistent infantile diabetes could explain the wasting and chronic skin infection but is exceedingly rare before the age of one. No comment was made on the state of the pancreas or urine testing for sugar. Bowel disease or malabsorption appears excluded by the post-mortem. In spite of the child's nanny's evidence, it seems that the child had a common but unusually severe 'nappy rash' from infrequently changed nappies.^[58]

Table 1

| Disease | Children cases | Children deaths | Unspecified cases | Unspecified deaths |
|---------------|----------------|-----------------|-------------------|--------------------|
| Diphtheria | | 1 | 21 | |
| Hydatid | | 1 | | |
| Influenza | | | 5 | 1 |
| Measles | | | 3 | |
| Meningitis | | 2 | | |
| Pneumonia | 4 | 1 | 66 | 8 |
| Scarlet fever | 3 | | 26 | |
| Typhoid | | 1 | 206 | 4 |

CONCLUSION

The table below tabulates the numerical data as published in the press. Ages are not stated in most cases, hence the unspecified columns. Total number of cases is approximate since numbers were not given for some outbreaks of infection. Number of inpatients for consecutive months may be new admissions or prolonged admissions, hence the data below is far from comprehensive.

However it is clear diphtheria, scarlet fever, pneumonia and especially typhoid were common and potentially fatal a century ago in the Tasmanian mining towns of Waratah and Zeehan. Meningitis in the pre-antibiotic era had 100% fatality.

There are an estimated 11–21 million cases of typhoid fever and 200,000 deaths occur worldwide each year, particularly in Africa and South East Asia. Some two billion people in our world consume contaminated water. It is estimated that achieving universal access to safe drinking water and sanitation in 140 low- and middle-income countries would cost about USD 114 billion per year, perhaps 0.5% of the GDP of China, the world's greatest polluter. One \$US per day could provide clean water for three people.

Unfortunately as previously stated finance drives policy. Company profits of multibillions and CEO salaries of multimillions are preferred by finance to universal clean water. No man, woman or child die in a war unless decreed by a politician. Similarly no woman or child would die of starvation or infection caused by unclean water unless decreed by a politician and business.

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