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NORTHERN SCOTLAND

Industrial deaths during construction of the first Tay Bridge, 1871-1878

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Abstract: *the deaths of workmen during construction of the Tay Bridges are usually mentioned in passing in histories of the collapse in 1879. There was only a minimal legal requirement for the investigation of such deaths, no public inquiry and the consequences for employers were few, if any.*

Key words: Tay Bridge; construction site; employee safety; industrial deaths

INTRODUCTION

The narrative history of the collapse of the Tay Bridge in 1879 is repeated regularly with emphasis on the critical event and consequential deaths of railway employees and passengers. Little attention seems to have been directed at trying to discover the physical risks during construction of the bridge and the industrial accidents then, although attempting to discover now what occurred is virtually impossible because of the legal regimes in place then. The conventional histories at best mention the occasional death of a workman, or perhaps the separate incidents in which several workman died.

The office of coroner in Scotland has few historians.[1] Deaths at the collapse of an engineering structure in mid-Victorian Scotland did not result in any inquest.[2] The debate on the decline of the office of coroner has its own history, and at least one lawyer qualified in England thought that coroners courts might be abolished.[3] The minimal legal processes and lack of regulatory supervision or accountability around workplaces in Scotland suggest an unconstrained freedom for entrepreneurs and their contractors. Broadly, the principles of liability for accidents were developing and their relevance to construction sites then might be thought doubtful.[4]

What followed in law after the accidental death of a workman in the course of his employment in the 1870s on the first rail bridge over the River Tay? The short answer was that nothing was required amounting to an inquiry in a *public* forum. Confidential investigation into sudden deaths by the Procurator Fiscal, as local public prosecutor, by the 1870s was an administrative task.[5] Whether anything followed beyond reporting to higher legal authority is unlikely, but that outcome was common.[6] The reduced role of Procurator Fiscal was probably acquiesced in because it was so limited, and as such it could not be construed as an admission of the need for a principle of government interference.[7]

ACCIDENTS

What is an accident? [8] One view in 1880 was that it was 'better not to attempt to define the term, because it is sufficiently significant in itself, and more significant than any definition, and because every definition, at least any we have seen, is apt to be incomplete and to overlook some case which it ought to embrace.'[9] A later textbook writer advised that the legal meaning of the word 'accident' was then *damnum fatale,* or 'an occurrence which is not to be foreseen or prevented, as opposed to one due to negligence.[10] It was also written that 'accident' in its legal use describes an event by reference to a cause; in its popular or wider meaning it describes an event apart altogether from its cause.[11]

The word 'accident' in legislation in 1897 led to its detailed consideration.[12] Elements of chance, lack of foresight, causes external to the incident, fault on the part of the deceased or injured workman, and visible external events were all considered on analysis.[13] Much later again, it was written, implying pragmatism as a policy, that sudden deaths due to industrial accidents had a cause that was

> at once apparent or it may emerge on very slight enquiry; it may never be reached only by exhaustive investigation; or it may never be ascertained with certainty… In the end, one may be left with sheer mystery.[14]

Without a duty to inquire fully or any meaningful consequences in law for those deaths occurring during employment there was no compelling reason for investigating or recording the incidents.

The Tay Bridge was built twice; the first collapsed catastrophically in 1879 and the whole structure was then rebuilt and opened for use in 1887.[15] The deaths of workmen in construction of the first bridge have been considered by some historians.[16] Some railway historians do not make any reference to the loss of life in construction.[17] The literature on events in 1879 is extensive, with discussion around the number of deaths of railway employees and passengers in the principal fatal incident, and the difficult recovery of the remains of the deceased.[18] There appears to have been no clarity around the industrial deaths as there has been for the construction of the Forth Bridge.[19]

The determination of facts and the identification of fault, or negligence, in the incidents of death at the Tay Bridge construction site can only be regarded as a major or impossible undertaking for individual tradesmen or labourers, given the absence of any official or police with the duty of getting involved. For on-site employees, accepting hazardous employment with higher risk and therefore, presumably, higher wages, the absence of disagreement with the requirements of their work might lead to an absence of any right of recourse that could have existed.[20]

Three relevant legal issues might now usefully be considered briefly: first, who were the actual employers of the workmen on the construction site? Local labour probably predominated because of the work being so dependent on the variable weather. There was also then a widespread tendency for short employment capable of being terminated with the minimum of notice.[21] It is highly likely that the individuals were paid in cash weekly. The employers were likely to be sub-contractors of either the *North British Railway Company* or the *Tay Bridge Railway Company*, the latter a different company, but with some directors on the board for each company.[22] Notably, it was a general principle of law, 'now well-established, that parties employing a regular contractor to do work for them are not responsible for his acts or operations.'[23]

Secondly, any worker employed in the construction of the Tay Bridge was covered by the principle that a worker accepted the dangerous risks inherent in any particular job, and that was an implied term of the contract of employment given that labouring for money was a voluntary act: *volenti non fit injuria*. In the mid-Victorian era the law was that knowledge of the risk, and the absence of compulsion to face it, or in other words the existence of an option to avoid it, satisfied the requirements of the maxim.[24] Yet, to the contrary asserting a political point, it has been commented that 'for most working people, consensus must have been as ironic a notion as free labour'.[25]

Finally, it had not occurred to Scots lawyers that the fact of the injured person being in the same employment as the person who injured him made any difference to the legal aspects of the case, and nor had it been thought that 'a master [employer] was under less obligation to his workman than to a stranger with whom he had no contract'.[26] Until 1858 the master might be held liable for his personal fault, as by having provided defective premises or machinery, or vicariously, for the personal fault of a manager or other subordinate or of a fellow-workman of the injured man, whether of precisely the same class and grade or not.[27] However, the doctrine of common employment had been applied in Scotland from 1858, contrary to established Scots law.[28] The workman injured at work because of the negligence of a fellow-employee was prevented by that doctrine from raising an action against *their* employer.[29] That inhibiting factor was based on the theory of the implied contractual acceptance of risk, and in practice it prevented an injured workman from seeking a deserved claim for damages.

The doctrine required the private vindication of rights to compensation, in reality most probably by impoverished workmen at their own expense, against others in the same financial position said to have failed in a duty. It became a source of political industrial discontent by the 1870s and what concerned the trade unions was that the doctrine discriminated against the manual worker and put the worker in a worse position, for compensation for injury, than a stranger or 'chance passer-by'.[30] The minimal risk of claims by workmen for compensation for injury suggests that the premiums for any insurance cover would be low, if any such policy actually existed.

The law was ameliorated by statutory changes in 1880, too late to cover the construction of the first Tay Bridge, but until 1897 the workman was not entitled to damages where 'he knowingly exposed himself to a known danger', which probably covered the whole of the construction site of the Tay Bridge over water and the raised works over land, and much else.[31] In this context, in fact and in law, the place of the construction of the Tay Bridge may be seen as an area of organisational monopoly by the railway company freed from public or state regulation, with little chance of litigation by workers. Further, there was no obvious trade union engagement which meant that the construction work was by non-union labour, 'so-called free labour'.[32]

CIRCUMSTANCES OF DEATHS

Attempts to define disasters by the harm to humans and the environment that they produce fail to capture the essential features of these events, and the perceptions of disasters reflect strongly the pre-occupations of whoever is doing the perceiving.[33] To see the Tay Bridge disaster only as the event that led to deaths on 28 December 1879 masks the earlier cumulative incidents during construction, and later during re-construction, that led to deaths. The difference of attitudes between the incidents during construction and the major collapse in 1879 were probably those associated with the social concept of risk, that is to say, 'dread and familiarity'.[34] Journalistic 'good copy' associated with the collapse of the bridge exceeded any general interest arising from the death of a single workmen.[35]

One contemporary comment was that the collapse was 'one of those catastrophes which impress the imagination far more than in proportion to the loss of life'.[36] That may be so but there was also litigation afterwards, not directed at compensation for life or injury, but rather at determining the extent of the obligation to remove the remnants of the old bridge. The completion of major new structures included an expectation of accidents: for the construction of the Tay Bridge 'a serious casualty list was regarded as inevitable'.[37] The 'wonder' was that there was 'so little loss of life or personal injury'.[38] The safety of the men employed in the construction of the bridge was said to have been the first consideration of the bridge manager, 'all other questions being rendered subservient to the comfort and security of workmen' of whom the workforce ranged in approximate numbers from 100 to 600.[39] However, the public commemoration of those railway employees and passengers who died in the collapse in 1879 has not been matched by inquiry into the deaths of construction workers.[40] Nor has much been made historically of the assistance for the nearest dependent relatives whose financial support had disappeared.

Without detailed evidence of the precise context of each death, it cannot now be said that all the physical events around the death of a workman was an accident, or even at least something that fitted then into a pattern.[41] Self-evidently, if a pattern of events and consequences was identified then a plan for prevention might have been devised. This uncertainty about the site management suggests a lack of any developed managerial concern for those tradesmen or labourers engaged on site and who subsequently died, or were injured. A contract of employment implies or states explicitly a set of expected events, with a degree of accountability somewhere for unfulfilled terms of agreement.[42]

A modern history of the Tay Bridge, in dramatic narrative form, a style that does not necessarily render any fact improbable, asserted that workmen were either crushed or drowned: 'One moment, a man would be fly-perched upon a rising girder-span, and the next moment the wind had picked him off and flung him down eighty to the water.'[43] Specific accidents often had several consequential deaths.[44] At any rate, crushing or drowning as causes of death suggest widely differing causes. There was at least some recognition of the difference in place for accidents. There were

> many other incidents in which workers were killed or injured, working often at height under difficult conditions. The most severe working conditions were experienced in the central or high girder spans, roughly equidistant from either shore and the most exposed part of the whole structure. If problems occurred here, help would not be close at hand.[45]

An assessment of a cause of death was a matter for a medically-qualified examiner. It is easy to see how a man with developing hypothermia on an exposed girder in the middle of the river Tay and thereby falling into the water below might be considered, by members of the public, to have drowned when the precise cause medically was or could have been the antecedent condition. There may be instances when such a falling man may have sustained a serious head injury first and thereafter fallen into the water. In an unregulated environment the nearest broadly stated cause of death was probably acceptable for administrative purposes. It had been thought, contemporaneously and somewhat naively, that with the compulsory registration of deaths from 1854, that the means had been provided for bringing all cases of sudden death under suspicious or unknown conditions to the notice of the appropriate authorities.[46]

However, the established system in Scotland was intended as a means of investigation into matters involving the criminal law, whereas the deaths in the construction of engineering works or in factories were not such as to engage the criminal law. Few, if any, of the commentators of the era seem to have been concerned about industrial accidents that caused death. The shortcomings of the

system in Scotland where there was no coroner, were that Procurators Fiscal, as solicitors in private practice, were mostly part-time office-holders, with a lack of accountability for failing to act, and simple causes of death were settled on. There were simple alternative models of solving a problem of settling on a cause of death, which were publicised.[47] Such support for that 'startling description' of 'the authorities' uniformly declining to interfere, that related to criminal matters and not industrial deaths.[48]

In practical terms, it is easy to understand how deaths may have occurred without there being a collision of barges and structures, or the collapse of metal or machinery on being lifted, and how causes of death identified. In the summer, 20 hours out of 24 were occupied with two shifts of 10 hours each, and in the winter of 1876-77 electric lights were used to allow work on shore.[49] However, the weather in the winters of the 1870s had been unusually severe.[50] Workmen on the bridge during construction were exposed to the elements, particularly storms and the wind, often very suddenly and lasting for days, even weeks.[51] During construction, the site of the bridge, from available photographs (see e.g., appendix below) seemed insecure with no apparent restrictions as who was allowed access. The site did not have handrails or safety nets at the edges on the sides of the bridge, nor toe-boards, nor workmen's safety harnesses fixed to secure points, and no signage is visible.[52] Construction materials seem to have been stacked for use but they were essentially left lying, waiting to be used and these constituted a tripping hazard, as did the access planks placed casually on the floor of the bridge. Hoists above the floor of the bridge had no protection against the wind; the dangers were obvious even if a fall was only down to the floor of the site.

Whether the clothing worn by individuals was appropriate to their place of work seems unlikely.[53] The variable sea bed, the height of the construction and adverse wind conditions meant that there was no scaffolding (a temporary structure on the outside of a building, made of wooden planks and metal poles, used by workmen while building), or staging (temporary platforms arranged as a support for workmen or between different levels of scaffolding) on the site and everything was, as far as possible, constructed in parts on the land and moved out to the bridge.[54] These circumstances suggest that training in safety on a corporate level was non-existent.

A trip or a slip of even a minor degree might well have led to a tumble, or a fall by a workman into the cold water below. A fall onto the wooden deck of a barge might have been survivable but one into the deep water of the river was probably not. Workmen in the mid-Victorian era did not wear high-visibility clothing and a fall into the water, particularly at a point away from the shoreline, would seem to have been highly problematic because of the difficulty inherent in spotting a struggling workman in the water with the weight of sodden clothing and leather boots.[55] The difficulties would be exacerbated early or late in the day during hours of restricted light. It is also possible that in constructing the approaches men fell from a height on to the hard land.

The personal dangers for workmen in the course of their employment on the bridges was known. When Sir William Arrol received the Freedom of Dundee in 1889, following the opening of the second Tay Bridge, he adverted to the place of the workmen in the whole scheme of constructing both edifices, and how these un-named skilled workmen ought not to be forgotten. As a rough estimate from the references by historians, the construction of the *two* Tay Bridges involved the deaths of a total of about 34 workmen. There does not appear to have been any attempt anywhere to identify and list (in print or by monument) those workmen who died nor their dependents nor any analysis of the facts and circumstances of the deaths such as by trade of place on the construction site, in order to discover the true causes of these events.

INVESTIGATION OF DEATHS

In Scotland, the Sheriff had the ancient responsibility of administering his sheriffdom, and thereby investigating crime which came to be, by slow delegation, the responsibility of the Procurator Fiscal.[56] The local public prosecutor in the Sheriff Court investigated sudden, suspicious and unexplained deaths to discover if there had been a crime.[57] Sudden deaths were investigated principally to exclude criminality. This has been said to be the first principle of efficient medico-legal investigation, namely that all sudden deaths of unexplained cause ought to be examined to exclude the possibility of homicide.[58] These investigations were in effect by a public official but conducted in private: 'much in the same way as in France'.[59] Whether that suggestion was then correct or not, comment contemporaneous with the construction of the Tay Bridge suggested that the Procurator Fiscal 'ought possibly' to be made coroner.[60]

Investigation involved to some degree qualified medical practitioners: the legal developments in Scotland at least, may be said to have been informed by the advance in medical knowledge.[61] Whether the reality matched these sentiments or purported explanations of the law may be doubted: there is evidence from 1843 that deaths continued to occur without 'the slightest notice being taken by Procurators Fiscal' unless in response to a formal complaint.[62] One writer in 1858 thought that the public in Scotland were content with their arrangements.

> We cannot well be charged with anything like a blind reverence for English law, or English forms of procedure; and we are far from wishing to say that a Coroner, elected by the rate payers of some petty village or rural district, is likely to be better qualified than our Procurator Fiscal, for inquiring into cases of sudden or mysterious death. There is not the least necessity for importing the details of English practice into our legal system, already sufficiently encumbered with foreign technicalities.[63]

It is easy to see how the mere involvement of the Procurator Fiscal, the public prosecutor, in the investigation of a death might raise general concerns, although the circumstances of a death might be shown swiftly to be unremarkable. An earlier view suggested that medical practitioners were privy to deaths that were not criminal but for which there was not an easy explanation: what might that have meant? The commentator offered advice on the failings of the procedures in Scotland.

> It is obvious that the defects of our Scotch [*sic*] method of inquest arise mainly from the circumstance that we begin our inquiries at the wrong end. Instead of calling on the public prosecutor, at this early stage, to take a precognition [a collection of witness statements] as for a charge of *murder* [emphasis in the original], the object should simply be to ascertain the cause of death by means of a public trial conducted by some neutral authority.[64]

The great reluctance of medical practitioners to become involved in anything that might be seen as quasi-criminal proceedings was accordingly emphasised. Indeed, it was said to be part of the argument that the very fact that a public inquiry was inevitable in all cases of 'mysterious or accidental deaths' would relieve an inquiry of much of the opprobrium of a criminal investigation.[65]

However, the rather ambivalent nature of the assessment of the duties of the offices of Coroner and, separately, Procurator Fiscal became obvious with the stated fear that the office of Coroner had fallen, in some towns, into the hands of 'an inferior class of men'.[66] Some of these men had, it was said, taken up cases for inquiry where the death was due to natural causes: the explanation

for such action was apparently to be found in the practice of paying by fees, which gave a reason for hearings.[67]

Views differed in mid-Victorian Britain as to what to do with non-criminal deaths: an English lawyer, Charles S. Greaves QC MA (Oxon), opined that the coroner's inquest 'in the present state of things is a very mischievous institution'.[68] It was 'impossible to conceive any tribunal that works worse in practice'.[69] The essence of the reasons for that criticism was the tendency of coroners' hearings to compromise later criminal prosecutions and the general inefficiency of arrangements.

However, the essence of the contemplated reform in Scotland would be restricted to two points and specifying these is important as it sets out the failings of the then system. First, it was thought best to

> deprive the Procurator Fiscal of all arbitrary discretion in the matter of prosecuting or refusing to prosecute such inquiries, and to oblige him, under suitable penalties, to hold a court of inquest upon receiving a written intimation from any qualified medical practitioner stating that so and so had died suddenly, and that the cause of death was unascertained, or on receiving an equivalent representation from one or more respectable householders in the neighbourhood. [70]

Secondly, it was suggested in bland and uncertain terms, that means should be taken to secure publicity, 'in so far as is consistent with decorum and with the nature of the inquiry'.[71] The exposure of the evidence of the death to the public was the plan. Thereafter, it was postulated, but somewhat naively it might now be thought, once the elements of certainty and publicity were secured the investigation in all other respects might safely be left to take care of itself.

The anonymous writer referred in the discussion to a pamphlet by a doctor in the Edinburgh area in which he detailed a number of cases, 'some of them of the most startling description' but unspecified, which the doctor had noted.[72] The result of his observations was that unless the authorities were positively requested by the relatives of a deceased person to investigate the cause of death, they almost uniformly declined to interfere 'no matter how notorious the suspicion of foul play, no matter how deep the interest of these very relatives to stifle and elude inquiry.'[73]

The desirability of an office of Coroner in Scotland arose in 1858 as part of a review of Scots law.[74] After discussion of contemporary concerns about the mode of investigation there was published for the information of the public the General Order by the Lord Advocate to Procurators Fiscal.[75] Considering the highly sensitive nature of the mode of investigation by Procurators Fiscal and the high privilege of absolute confidentiality given to Crown papers, it is surprising even now to see such an order set out for whoever purchased the journal of the time.

In brief, the order required a Procurator Fiscal in the case of death by accident, sudden death, the discovery of a dead body or the death of a person in custody to make inquiry, obtain a report from a qualified medical practitioner and report to the Crown Agent, an Edinburgh solicitor who was also the administrative head of Crown Office. The latter would make the papers available to Crown Counsel for a decision, especially in regard to intimating to the Registrar of Births, Deaths and Marriages any final cause of death for an individual. The rules in the General Order are brief but there is little doubt as to where the responsibility lay for inquiry, and the existence of supervision by the Law Officers who were accountable to Parliament.

The regulations referred to were the instructions sent out from Crown Office to Procurators Fiscal, which the latter were to follow. These regulations were promulgated as new circumstances arose. The *Books of Regulations* were not law as such, but in a centrally-directed bureaucratic system

with an acute hierarchy of officialdom, the importance of these publications imposed certainty and regularity and exuded state authority (albeit in a necessarily attenuated form) that cannot in context be overstated. Administrative arrangements for investigative strategies to find facts could achieve conveniently and discretely results that otherwise required judicial activity in public and slowly.

The *Book of Regulation* published in 1868 was a revised collection of all instructions from which it may be surmised that the desirability of regulation of crime and deaths in a changing society had become a necessity. In the 1868 regulations, the medical contents had been revised by three professors of medicine.[76] The regulations and instructions had been revised by Crown Counsel. All Procurators Fiscal were instructed by the Lord Advocate to observe this code of instructions in criminal and other investigations. The style of the book was that of a codification of the instructions from Crown Office sent out over earlier years.[77]

The Procurator Fiscal was required to report the death to Crown Office in every case, where death has occurred, and *there is any suspicion or reasonable grounds to suppose that it may have been occasioned by violence* [emphasis in original], even although no particular person may be suspected.[78] Further:

> In all cases of *death from accident* [emphasis in the original], which shall come to the knowledge of the Procurator Fiscal, through reports by the police, or otherwise, it shall be his duty to make inquiry, or if deemed advisable by him, to take a precognition, relative to the facts connected with the accident and the death of the individual.[79]

A comparable rule applied in regard to sudden deaths and also to the circumstances where a dead body is discovered or notice was received of the suicide or death of a prisoner in custody.[80] The Procurators Fiscal were required to obtain a medical report from a qualified medical practitioner relative to the cause of death for the last two categories of death.

It seems likely that the next rule is the most important covering as it seems to do the vast bulk of deaths, which were unremarkable in any characteristic:

> Where in any case the medical practitioner employed can, <u>without opening the body</u> [emphasis added], satisfy himself, and certify in usual from that the deceased died from natural or from ascertained causes, his written report to that effect will be taken as sufficient compliance with the foregoing Rules.[81]

A form of inquiry and report by a Procurator Fiscal was referred to in the regulations.[82] This approach was recommended for use in cases where a formal precognition was not essential.[83] Moreover, in cases of a still more simple or ordinary kind, it was thought sufficient for Procurators Fiscal to report that on inquiry if has been found that the death to have arisen from some natural cause, or under circumstances not inferring blame – stating at the same time, as accurately as possible, the cause and circumstances of the death.[84]

In this chapter of instructions there was one rule in particular which made it clear beyond any doubt where investigative responsibility was being laid:

> It is the duty of the Procurator Fiscal to make the inquiries, and to take the precognition, and to obtain the medical certificates directed by the foregoing rules, and he is responsible for doing so. The police informations [final reports] will not be forwarded with any proceedings reported by the Procurator Fiscal to the Crown Agent.[85]

The general dissatisfaction with the prevailing system was not abated by the production of the *Book of Regulations.* Adverse comment in 1876 suggested a practical urgency that was unappreciated by policy makers, such as there were. A pamphlet prepared by the Medical Officer of Health for Glasgow and dated 19 April 1875 was discussed in an article in the pages of the *Journal of Jurisprudence*.[86] Reference was made there to the law of the registration of deaths which required that a medical certificate of the cause of death be produced to the Registrar so as to appear in the registers of death. The article in the law journal acknowledges the terms of the medical pamphlet where a contrast is made between the Coroner in England and the Procurator Fiscal in Scotland. The writer of the pamphlet preferred the coroner

> because it both adds considerably to the certification of deaths which otherwise would be uncertified, and acts as a recognised deterrent from neglect to procure attendance during life, while the system of Fiscals' precognition is useless for either end. It is right to point out that the Fiscal institutes his enquiry [*sic*] solely for the *detection of crime* [emphasis in original]. The coroner certifies to the Registrar in England the causes of death in a class of cases, amounting to five or six times the number certified by the Fiscal to the Registrar in Scotland, after the lapse of months.[87]

In short, the Procurator Fiscal whose responsibility had been directed at one aspect of death (exclusion of criminality) was, in the absence of anyone else to do so, being expected to take on another role (determination of the medical cause of death). In these circumstances it may be doubted whether it was then carried out very satisfactorily. If the criticism in the pamphlet was read by those who might have done something, nothing much came of it in a legal sense. Indeed, a criminal case in 1940 gave some indication into the line of thinking 90 years earlier and the concerns earlier. The relevant judicial comment was that *to arrive at a cause of death by a process of elimination of common alternatives was unsafe*.[88] That view was expressed in the context of a capital murder case with regard to an earlier capital case. No such inhibitions need necessarily have applied to settle a cause of death of a workman killed at work.

Yet, any existing unhappiness about incomplete certification did not feature in the address by Professor Douglas Maclagan to the British Medical Association at Bath on 9 August 1878.[89] He preferred the Scottish system and he repeated that view when he appeared before a Select Committee of the House of Commons: consideration was then being given to a Coroners' Bill and the Scottish perspective was sought.[90] On this occasion the professor was accompanied by William A. Brown, the Procurator Fiscal at Glasgow, who offered a legal view of the system. He explained that traditionally the Sheriff had been responsible for the investigation of crime within his particular geographical jurisdiction but over time the responsibility for the investigation of deaths had been delegated to the Procurator Fiscal as the Sheriff's 'executive officer'. The duty had been to exclude criminal deaths but that had led to inquiries being extended to all deaths: 'In the strict sense of the word, there was no coroner in Scotland. In recent times it had become the practice of the Procurators Fiscal to be coroners ...' [91]

KNOWN DEATHS IN CONSTRUCTION

The *North British Railway Company* maintained an accident book, but the list for 1868 to 1881 merely has claims on the company for deaths of nearest relatives or personal injury in railway accident or when crossing or on railway property.[92] Although an initial claim was recorded in the book, not all

claims were necessarily pursued by the aggrieved person, and many are marked as having been discontinued. There is a section for the claims that followed the collapse of the bridge on 28 December 1879 but these too are by nearest relatives following the deaths of railway staff or passengers.[93] It seems from the contents of the known accident book that the deaths of, or injury to, workmen engaged in construction work, if recorded at all, were not specified there.

It cannot be said that those responsible for the construction site for the Tay Bridge had no knowledge of the events involving deaths at the construction site. Sir Thomas Bouch appointed William Paterson and Henry Noble, the former a chartered engineer and the latter 'a first class man in the masonry and brickwork department'.[94] It was not possible for a supervising engineer, two inspectors and various numbers of their assistants not to know of what had happened immediately on their construction site, particularly if progress was threatened or actually impeded. It is possible that the addition of a further Inspector, William Muir, followed from the first of the two known major industrial accidents.[95]

First, 'the most disastrous calamity' on 26 August 1873 when six workmen died in the same accident which in engineering terms was probably more technically complex than suggested in general narratives.[96] Large cylinders, or caissons, were lowered to the bed of the river and emptied of water allowed workmen to descend into the void so that they could work on the structures and the ground around it. On this occasion, a contemporary press report narrated that the cylinder exploded and two men at the top of one cylinder were blown into the water and survived by swimming ashore. The six men working below were overcome by water and drowned. [97] Four other workmen escaped from an adjoining place of work and they got into a safety boat there but after waiting an hour, it being pitch dark, and silent except for the noise of the river and nothing heard from the missing six men, they went ashore.[98]

It was said within two days that the 'most thorough investigation' had been made and it was 'exceedingly doubtful whether the real cause will ever be ascertained'.[99] Later, it was added that 'a searching inquiry' had been made about the matter but the exact cause was never explained satisfactorily.[100] Nothing of the technical difficulties was made available to the public and any findings, such that might have impacted on the progress of the whole construction, seem to have been passed over without public scrutiny by others. Such a discrete approach is evident in that the remains of the deceased were removed from the workplace at 1am and each put into a shell and returned to their respective homes. In this way, it was stated, 'any sensation which might have attended their removal during the day was entirely prevented'.[101] The only safety change from the deaths seems to have been working hours were restricted from 12 hour shifts to 8 hours and the hourly rate increased from 8d [eight old pennies] to 12d [one shilling] although some workmen were unhappy at the change in hours.[102]

Secondly, on 2 February 1877, the lifting of major parts of the bridge into place led, somehow, to these substantial elements falling from the hoists onto other parts of the bridge under construction and into the water. Several workmen missed death, one sustained a severe leg fracture and another appears, somehow unseen, to have fallen into the water and had been lost: as a matter of speculation he 'must have fallen off the pier or missed his footing at embarkation'.[103] An extra-ordinary gale had appeared quickly and then the accident occurred.

Leaving the structure by boat was impossible in the conditions and 54 workmen were left on the girders to spend 'a fearful night' and when removed later at 5am were 'terribly benumbed, drenched to the skin and nearly half-dead with cold'.[104] A man who was thought to have been lost re-appeared later. However, William Laughran, the missing man, had been part of the larger group and

he went missing while on the structures and was thought to have fallen into the river and drowned.[105] Without any clear evidence of a fall that caused a death, or circumstances that suggested that death must have ensued, there was no known death for what was in any event the very limited involvement of any authorities.

In neither major incident, so far as can be discovered, were there any subsequent investigations made or, if made, publicised. The other deaths, not in these two incidents, seem to have been individual accidents in which a workman was injured and died, or simply fell into the river below and drowned. Given the existence of a *Tay Bridge Accident Fund,* relying on public donations, founded as early as *six years before* the collapse at the end of 1879, the risk from atrocious weather and dangerous site conditions and probable deaths and injury had been anticipated by some.[106] The fund may be, and probably is, indicative of an absence of any suitable employment insurance policy or even an employee's benevolent fund.

The railway company or the construction company may have contributed to the accident fund, although the deaths and injuries of workmen may have been regarded by the railway company as no concern of theirs because constructing the bridge was at various stages the responsibility of other companies: the *modus operandi* for the construction of the bridge was 'left to the contractors'.[107] Alternatively, the railway company may, with knowledge of their lack of legal liability, have simply not bothered to record incidents involving the employees of others as there were no obligation to do so and no public consequences in other regards for these events.

Railway companies had to make returns of accidents to the Board of Trade but those events had to be 'in or about any railway or any works or buildings connected with such railway, or any building or place, whether open or enclosed, occupied by the company working such railway', and the list included 'any accident attended with loss of life or personal injury to any person whomsoever' and also 'any accident of a kind not compromised in the foregoing descriptions, but which is of such a kind as to have cause loss of life or personal injury, and which may be specified in that behalf by any order to be made from time to time by the Board of Trade'.[108]

It seems to be a reasonable argument that the site of the construction of a bridge, for use *later* once completed and then in use by a railway company, was not a railway at the time of that construction and notification was not required. Given the nature of the two miles of bridge being constructed over water, it is not at all certain that industrial deaths there were in any way consistent with other railway deaths over land even if bridges were involved.

AN UNREGULATED CONSTRUCTION SITE

The lack of Parliamentary interest in safety on the railways attested to the power of the railway lobby amongst Members of the Commons, and to the weakness of government in the mid-Victorian period.[109] Moreover, the 'Scottish paradox' was probably central to the relevance of construction deaths: the Scottish intelligentsia had acquiesced in parliamentary union, and yet had been granted policy autonomy in, amongst other things, the law.[110] There was then no political pressure in Scotland for workers protection. Generally, those workmen engaged in the construction of the Tay Bridge ran a known risk, and that included any disaster. There was a no regulatory or supervisory regime but the least possible accountability in law.

Moreover, there was no organisational unity amongst employers, and hence no consensus on labour questions: 'each firm pursued an individual route'.[111] Such labour questions must surely have included matters of health and safety, and pay. Indeed, the wonder is how it was that those managing the construction of the Tay Bridge were able to recruit men to work in such dangerous conditions

given that there was then the largest jute mill in the world in Dundee, and 49% of the labour force in the city was employed in the manufacture of jute.[112]

The minimalist demands of common law and statutory regulation over the industrial activity such as the site of the construction of the Tay Bridge suggest few viable dynamics for change. Doubtless the function and structure of executive government changed profoundly in the course of the nineteenth-century.[113] Perhaps there is room in all this for recognition of the *irrelevance* here of the fallacy of *post hoc ergo propter hoc.* Humanitarianism cannot be credited with merciful legislation, or a recognition that merciful legislation itself contributed to humanitarianism.[114] No workplace safety legislation can be attributed to lessons learnt from the events of the Tay bridge disaster, as no one who has taken an interest in the disaster has specified any specific lessons learnt around personal safety arising from the whole event.

Some individuals in authority did appreciate what was involved in the physical labour: Sir William Arrol was 'always very concerned for the welfare of his workforce', but he was alert also to the inherent problems.[115] Drunkenness 'was a considerable problem' during the building of the Forth Bridge and Sir William once commented that he never visited the site without seeing drunken construction workers outside the works, apparently having been put out until they had sobered up. Thus, one railway historian has argued, it is 'probably true to say that drink was responsible for the comparatively high number of accidents' in building the Forth Bridge.[116] That may be too simple and judgemental a statement to be of much value: what caused the consumption of alcohol during construction? It may have been simply a response to the cold and dangerous conditions.[117] If it had been simply alcohol dependence as such, then presumably with a continuing risk the offending workmen would have been dismissed rather than allowed to return once fit to work.

At the site of the Forth Bridge there were 'rigorous safety regulations – handrails wherever possible on the superstructure, wire netting being stretched on frames below any exposed point, and lifeboats constantly patrolling the water below', but the railway historian does not specify any legal 'regulation' and what may have been seen followed from benevolent managerial instructions for that site: benevolence and legal duties import different qualities. The same may also be said of the *Sick and Accident Club* established in 1883 for the benefit of Forth Bridge construction workers and membership was compulsory.

The lessons that emerged from the practical circumstances at the construction site of two Tay Bridges may have informed the arrangements at the Forth Bridge site. In the immediate aftermath of the Tay Bridge collapse, the *North British Railway Company* sought to find from 'local evidence' reasons for the catastrophic event, and a lack of supervision during the construction was soon identified, amongst other reasons.[118] In context, the actual inquiry was held essentially in pursuit of engineering explanations, but it seems likely that, with Sir William Arrol supervising the construction of the second Tay Bridge, any failures (including poor workmanship) were identified. The whole circumstances around the River Tay, not least the state of the law, support the idea that the widest possible definition of 'lack of supervision' ought to be considered relevant.

The construction of the Tay Bridge must be seen in the context of the deferential and coincidentally indifferent society then. A contemporary political concern was the 'scant' attention paid to Scottish affairs at Westminster.[119] If that was true at the national political or policy level, it seems also to have been true in regard to the supervision to ensure the safe construction of the bridge. There is little doubt that the conceptual framework in Scotland around the time of the Tay Bridge disaster was understood elsewhere, but not necessarily approved. One coroner wrote of changes to the

English system around investigating deaths being unacceptable as they 'savoured of the Scotch secret system of inquiry'.[120]

Yet, the facts and circumstances of deaths do not always warrant public hearings and a general airing of personal medical details (even by discrete coroners) is not necessarily what nearest relatives wanted.[121] The Procurators Fiscal, as local representatives of the Sheriff acting on policy instructions emanating from the Lord Advocate, relied on 'medical men' from whom information as to deaths might be obtained, all in the context of seeking uniform implementation.[122] The *Book of Regulations* of 1868 provided in effect a code of practice and it seems likely that much earlier practice would have merely been incorporated into the text.

An indication of an administrative deference to medical practitioners, is apparently a constant theme in the law of Scotland. For the vast bulk of deaths, unremarkable and almost routine as being the expected events, certification by a medical practitioner concluded any necessary interest of the Procurator Fiscal. In the context of the construction of the Tay Bridge, first and second, the 'facts' were only too obvious: the weather was atrocious at times, the work highly dangerous and it can be seen from contemporary photographs that there was no corporate considerations of health and safety as there would be undoubtedly now.

The developing complexity of society in the mid-Victorian era promotes the idea that the nature and extent of the incidents to be investigated were becoming beyond the capacity, and perhaps even capability, of a local Procurator Fiscal: for example, sudden or unexpected deaths related to medical operations or mishaps must surely have multiplied enormously.[123] The instructions from Crown Office in the *Books of Regulation* suggest strongly that inquiries into deaths were (once criminal activity had been excluded) a means of establishing the bare facts judicially for the information of the executive for whatever action it considered desirable. Avoiding a recurrence, especially where *public* safety might have been compromised, could be a desirable policy objective but remedial legislation when balanced politically with *laissez faire* circumstances suggested too much executive interference.

In Scotland especially, confidentiality was regarded as an essential part of the system in which deaths were investigated.[124] The law was at the time defective in not having a suitable means of promoting or ensuring public accountability. When the growth of the direct influence of trades unions, arguing for a system of investigating industrial deaths in Scotland comparable to the *mandatory* public inquiries in England and Wales, led to the introduced of Fatal Accident Inquiries, the political tensions around industrial deaths had altered to require answerability.[125]

CONCLUDING REMARKS

Railways and rail construction constituted 'perhaps the most distinctive manifestation of Victorian enterprise'.[126] Historians of the *first* Tay Bridge have suggested various numbers for the industrial deaths during construction, from between 14 and 20. One contemporary engineering description of the *second* Tay Bridge asserts that the number of fatal accidents was 13 and these were 'almost entirely' confined to men falling from the pontoons or wharves into the river, or from their over-balancing themselves on the high parts of the structure

> in fact [*sic*], they were not occasioned by negligence or carelessness in the manner of carrying out the works, but were due in almost every case to the individual recklessness of the men themselves.[127]

A reliable or objective source of that purported 'fact' was not shared with the reader, but that narrative clearly shifted responsibility for deaths to the workmen themselves. Similarly, another railway historian opined that: 'structural workers were notoriously rash'.[128] It may be supposed that around 30 or so men died building the *two* Tay Bridges: in the absence of any formal determination of the facts and circumstances of each death the best that might be done is to find some reference in local or trade press reports. However, the true number of workmen injured in the course of their employment is simply unknown now. The causes of death, criminality having been excluded, could well have been any medical assessment, apparently reasonable in the circumstances. In the evolving politics of the late 1870's can be seen the complaints of the neglect of the well-being of workers, with many of the main issues being considered 'constitutional and temperance fads'. [129]

The minimal extent of government involvement in industrial sites is demonstrated by, first, a procedure for regular and accurate reports of deaths from local representatives to the central executive, the Lord Advocate. That procedure was commendable to the extent that the peak of the pyramid received reports of events and their outcomes, or at least the clerks in the office did. The democratic and, indeed, constitutional accountability within the Scottish system was admirable as the Lord Advocate in Parliament was answerable for such matters. Yet, given the state of the law in regard to workers on the Tay Bridges nothing happened after industrial accidents and deaths.

Secondly, in any event mid-Victorian economic theory favoured the minimalist state and in the history of the administrative evolution of the inspection of construction works, the Tay Bridge that collapsed in 1879 showed what *did* happen in an absence of any means of accountability, coercive force or even a statutory prohibition requiring self-enforcement.[130] An argument has been made reasonably that Britain had moved much further from the interventionist government than its main trading rivals.[131] The Tay Bridge disaster is illustrative of the results of minimalist legislative or even corporate intervention.

To make a simple point about the regulation of construction sites and a completed structure, the evidence of one witness might be cited. Thomas Congleton, a solicitor, lived in Newport, Fife, and worked in the firm of Heron and Congleton, solicitors, Castle Street, Dundee. He commuted regularly by bridge between home and work, sometimes he did the journey four times a day. He recalled in a witness statement after the collapse that he had *walked* across the bridge four times in all.[132] There is no suggestion that special permission was necessary or had been obtained; nor was it said that any security had to be overcome. Access to the completed bridge appears to have been unregulated and foot passage by the public was not prevented.

The legal context of the collapse of the Tay bridge in 1879 suggests, it is argued now, that Scotland may have moved even further towards a *laissez-faire* business environment than elsewhere in the United Kingdom on account of the recent imposition of the doctrine of common employment; the continuing absence of any managerial accountability in a public forum; and, the apparent indifference, or perhaps more charitably the inactivity, of central authority in Edinburgh and London (two separate hurdles). Such engineering triumphs as the two Tay Bridges, and the economic benefits from a new railway link, held out the promise of great wealth for the financial risk takers and they were left to pursue their aims.

Whether as a results of an accident, *damnum fatale* or if caused by the negligence of others, an injured workman had probably little practical recourse in law anywhere to obtain compensation. It is not difficult in these circumstances to accept the view that *laissez-faire* was not just losing its appeal as politics moved to a more class-based foundation, but caused such a move.[133] If anything, the true importance politically of the collapse of the central part of the first Tay Bridge was its symbolic

representation of the ideal minimalist state which was soon to lose its place in the intellectual atmosphere with the development of class consciousness.[134]

Please see the next page below for the APPENDIX

APPENDIX

Pier 41. Reproduced by kind permission of *Libraries, Leisure & Culture, Dundee*

[1] Robert Houston, *The Coroners of Northern Britain* (London: Palgrave, 2014), see p. 5 for a description of how there came to be an erosion of the significance of coroners in Scotland.

[2] Robert S. Shiels, 'The Investigation of Sudden Deaths and the Tay Bridge disaster of 1879' 2016 Jur. Rev. 213-226. For the workings of the legal system in regard to deaths other than in major incidents see Robert S. Shiels, 'The Investigation of Sudden and Accidental Deaths in Scotland', in Susan Buckham, Peter C Jupp, and Julie Rugg (eds) *Death in Modern Scotland, 1855-1955: Beliefs, Attitudes and Practices* (Oxford: Peter Lang, pb., 2016), Chapter 9.

[3] C.S. Greaves QC, 'Criminal Procedure' (1866) 21 *Law Magazine and Law Review* (February – August: issue XLII) 165 – 214, at pp. 177-186, esp. p.179 and 181. One Scots lawyer noted the point: Anon., 'Prisoners Declarations' in James Hutton Watkins (ed.) 5 *Scottish Law Magazine: New Series* (Glasgow: Thomas Murray and Son; 1866), 65 – 69, at p. 65.

[4] Walter Cook Spens and Robert T. Younger, *Employers and Employed* (Glasgow: James Maclehose and Sons; 1887) describe the liability of employers as it applied to the public and, separately, employees: Parts 1 and II.

[5] Robert S. Shiels, 'The Mid-Victorian Codification of the Practice of Public Prosecution (2019) 98 (248) *Scottish Historical Review* (Supplement) 410-438, at p. 420.

[6] Earlier inquiries into mining disasters established causes for particular incidents, though that never led to further action: O.O.G.M. MacDonagh, 'Coal Mines Regulations: The First Decade, 1842-1852' in Robert Robson (ed.), *Ideas and Institutions of Victorian Britain* (London: G. Bell & Sons, 1967), p. 69.

[7] MacDonagh, 'Coal Mines Regulations', p. 75.

[8] The question was being asked contemporaneously: Anon., 'Accident Insurance' (1880) 24 *Journal of Jurisprudence* 645-659. There is reference there to several possible definitions. In the textbook following legal reform of 1895 in Scotland, the author starts with the definition of 'accident': Henry H. Brown, *The Procedure in Accident Inquiries and Investigations* (Edinburgh: T & T Clark, 1897), pp. 2-4.

[9] Anon., 'Accident Insurance', ibid, p.647.

[10] Arthur Thomson Glegg, *Commentary on the Workmen's Compensation Act 1897* (Edinburgh: William Green & Sons, 1898), p.12.

[11] Glegg, *Commentary*, ibid, p.12.

[12] E.g., Charles H. Brown, in 'What is an accident?' (1903) 15 *Juridical Review* 183-5, considers contemporary case law on the issue.

[13] Brown, 'What is an accident?', p. 184.

[14] James Mill, *The Scottish Police: An Outline of Their Powers and Duties* (Edinburgh: W. Green & Son, 1944) p. 59.

[15] The first Tay bridge as a construction site seemed to have started with the laying of a foundation stone on the south, Fife, side of the river on 22 July 1871 and a similar move on the north side on 7 August 1871: *The Scotsman,* 21 September 1877, p. 3. The first bridge was formally opened for public business on 31 May 1878.

[16] E.g., John Prebble, *The High Girders* (London: Secker & Warburg; re-issued 1975) p. 217 (20 deaths); Andre Gren, *The Bridge is Down*, (Kettering: Silver Link, pb., 2008), p.9 (20 deaths); David Swinfen, *The Fall of the Tay Bridge* (Edinburgh: Birlinn, pb. 2nd ed., 2016), pp. 43-5 (20 deaths), relying on Prebble, op. cit., and 'John Leng & Co., *The History and Construction of the Tay Bridge* (1878)'.

[17] E.g., Peter F. Marshall, *The Railways of Dundee* (Oxford: Oakwood Press, 1996), Chapter 6. Charles McKean, *Battle for the North: The Tay and Forth Bridges and the 19th-Century Railway Wars* (London: Granta, 2006), pp. 246-7, (referring to the rebuild, 'only 14 deaths');

[18] Murray Nicoll, Clare Nicoll and Grant Buttars, *Victims of the Tay Rail Bridge Disaster* (Dundee: Tay Valley Family History Society, 2005) is devoted to identifying the dead from the collapse on 28 December 1879.

[19] Sheila Mackay, *The Forth Bridge: A Picture History* (Edinburgh: Birlinn, 2011 ed.), 'The Sacrifice' pp.59-61. The author states that 57 lives were lost during construction and 518 men taken to the Edinburgh Hospital: ibid, p.59.

[20] Spens and Younger, *Employers and Employed*, ibid, pp.93-94.

[21] Trevor Griffiths, 'Work, Leisure and Time in the Nineteenth-Century' in Trevor Griffiths and Graeme Morton *A History of Everyday Life in Scotland, 1800 to 1900* (Edinburgh: Edinburgh University Press, pb., 2010), p. 171.

[22] *The Dundee Directory, 1878-1879,* (Dundee: James P. Mathew & Co., 1878), p.39.

[23] *North British Railway Company v Leadburn Railway Company and Waddell* (1865) 3 Macpherson's Reports 340, *per* Lord Neaves at p.343.

[24] Glegg, *Commentary*, pp.6-7, and see fn. for the relevant case law.

[25] K. Figlio, 'What is an accident?' in Paul Weindling (ed.), *The Social History of Occupational Health* (London: Croom Holm, 1985), p.194.

[26] Glegg, *Commentary*, ibid, p.2.

[27] For the case law, see David M. Walker, *A Legal History of Scotland : Volume VI: The Nineteenth Century* (Edinburgh: Butterworths,2001), pp.909-910, and footnotes there.

[28] Terence Ingman, 'The Rise and Fall of the Doctrine of Common Employment' 1978 Jur. Rev. 106-125. The appellate committee of the House of Lords had imposed the rule in Scotland, whereas the developments in the courts in Scotland during the period of 1847-58 had been 'much more enlightened': ibid., p. 115. The doctrine was also known as that of 'collaborateur': Spens and Younger, *Employers and Employed*, ibid, pp. 62-92.

[29] The rule also applied to industrial deaths and associated claims: *Bartonshill Coal Co. v. Reid* (1858) 3 Macqueen's Reports 226: *Bartonshill Coal. Co. v. McGuire* (1858) 3 Macqueen's Reports 300.

[30] Ingman, 'The Rise and Fall of the Doctrine of Common Employment', p. 121.

[31] Walker, *A Legal History of Scotland,* ibid, p.910 and footnotes for case law.

[32] Vernon Bogdanor, *The Strange Survival of Liberal Britain* (London: Biteback Publishing, 2022), p.244.

[33] Tom Horlick-Jones, 'Modern Disasters as Outrage and Betrayal', 13(3) *International Journal of Mass Emergencies and Disasters*, 305-315, at p. 307.

[34] Horlick-Jones, 'Modern Disasters as Outrage and Betrayal', ibid, at p. 308.

[35] Horlick-Jones, 'Modern Disasters as Outrage and Betrayal', ibid, at p. 309.

[36] Anonymous, 'News of the Week', *The Spectator*, Issue 2688, 3 January 1880, p. 9.

[37] Grothe, *The Tay Bridge: its History and Construction,* ibid, p. 68.

[38] *The Scotsman*, 21 September 1877, p. 3.

[39] Grothe, *The Tay Bridge,* ibid. Gren, *The Bridge is Down*, ibid, p. 9, asserts that 660 were employed. With a variable size of workforce at different times and on different tasks in the construction over years, the exact maximum on any one occasion may have been difficult to assess.

[40] See Swinfen, *The Fall of the Tay Bridge,* Appendix 1, for background, and p. 142, for a photograph of the memorials placed at the side of the river Tay.

[41] Figlio, 'What is an accident?', ibid, pp. 180-206, at p. 180.

[42] Figlio, 'What is an accident?', ibid, pp. 180-1.

[43] Prebble, *The High Girders,* ibid., p. 56.

[44] Grothe, *The Tay Bridge* p.68*;* Prebble, ibid., p. 56-7. Prebble relates the deaths of two workmen without specifying a date for the incidence of a collapse of machinery, and similarly another in which two further workmen died.

[45] Peter R. Lewis, *Beautiful Railway Bridge of the Silvery Tay: reinvestigating the Tay Bridge Disaster of 1879* (Stroud: Tempus, 2004), p. 33.

[46] Anonymous, 'Official Inquiry in Cases of Sudden Death' (1858) *Journal of Jurisprudence* 2, 271-6, p. 271

[47] James Craig, *On The Law of the Coroner and on Medical Evidence in Preliminary Investigation of Criminal Cases in Scotland*, (Edinburgh: Sutherland and Knox, 1855), esp. pp.20-21.

[48] Anon, "Official Inquiry in Cases of Sudden Death", (1858) *Journal of Jurisprudence* 2, 274-5.

[49] The Scotsman, 21 September 1877, p. 3; Grothe, *The Tay Bridge,* p. 67.

[50] Kean, *Battle for the North,* p. 132.

[51] Grothe, *The Tay Bridge,* pp. 65-6; Prebble, ibid., pp. 35-6, and p. 55. Robin Lumley, *Tay Bridge Disaster: The Peoples' Story* (Stroud: The History Press, 2013), p. 99.

[52] Kean, *Battle for the North,* ibid, at pp. 253 reproduces an area of the site with obstructions to the walkway; Swinfen, *The Fall of the Tay Bridge,* ibid, at p. 47, reproduces a photograph taken during construction that demonstrates the severely exposed and dangerous position of workmen. Also, Gren, *The Bridge is Down,* ibid, in the photographs reproduced between pp. 112 and 113, shows on pp. II and IV shows the same scenes of a deeply unsophisticated construction site clamant of danger to those on it.

[53] The tall man standing on the right of the photograph in the annex is Sir Thomas Bouch who designed the bridge and he appears to be wearing ordinary clothing and hat.

[54] Albert Grothe, The Tay Bridge, NATURE, (1 August 1878), 361-368, 362.

[55] McKean, *Battle for the North,* on p. 247, reproduces a contemporary photograph showing three men and, apparently, three boys whose positions at the workplace suggest the dangers referred to.

[56] William Reid, 'The Origins of the Procurator Fiscal in Scotland', 1965 *Juridical Review,* 154-160.

[57] J.D.J Havard, 'Detection of Secret Homicide: A Study of the Medico-legal System of Investigation of Sudden and Unexplained Deaths', (London, Macmillan, 1960) 186 fn. 1 explains how the absence of local public prosecutors inhibited an introduction in England of a system similar to Scotland.

[58] Havard, 'Detection of Secret Homicide', 39.

[59] JW Brodie-Innes, 'Some Outstanding Differences between English Law and Scots Law: Part IV, The Little Courts', 1915 *Juridical Review* 27, 312-27, 323.

[60] Dr J.J. Gordon, 'The General Criminal Law of Scotland as a basis of improvement and new legislation', Edwin Pears (ed.) *Transactions of the National Association for the Promotion of Social Sciences* (London: Longmans, Green, Reader & Dyer, 1871) 295-6, at p. 296.

[61] D.J. Pounder 'Law and Medicine in Scotland' (1993) 14 *Am J Forensic Med Pathol*, 340, 346-7.

[62] Havard, 'Detection of Secret Homicide', 50–1.

[63] Anon, "Official Inquiry in Cases of Sudden Death", ibid, pp. 271-6.

[64] Anon, "Official Inquiry in Cases of Sudden Death", 272.

[65] Anon, "Official Inquiry in Cases of Sudden Death", 273.

[66] Anon, "Official Inquiry in Cases of Sudden Death", 273.

[67] Anon, "Official Inquiry in Cases of Sudden Death", 273.

[68] C.S. Greaves, 'Criminal Procedure' (1866) 21 (February – August: Issue XLII) *Law Magazine and Law Review* 165-214, pp. 177-186, esp. p. 179. Greaves had been in practice and he was the Editor of the 3rd and 4th editions of Russell on *Crime*.

[69] Greaves, 'Criminal Procedure', ibid, p. 181.

[70] Anon, "Official Inquiry in Cases of Sudden Death", 274.

[71] Anon, "Official Inquiry in Cases of Sudden Death", 274.

[72] Anon, "Official Inquiry in Cases of Sudden Death", 274-5.

[73] Anon, "Official Inquiry in Cases of Sudden Death", 275.

[74] Anon, "The 'Edinburgh Review' on Scottish Law", (1858) 2 *Journal of Jurisprudence*, 553-7.

[75] Anon, "The 'Edinburgh Review' on Scottish Law", 556–7.

[76] National Records of Scotland ('NRS'): AD5/11: 'Regulations to be Observed in Criminal and other Investigations': (hereafter '1868 Regulations') Introduction dated 1 July 1868 by TG Murray, Crown Agent referring to the contributions of Robert Christison, James Syme and Douglas Maclagan. For discussion of the importance of this central text of government policy see: Robert S. Shiels, 'The Mid-Victorian Codification of the practice of Public Prosecution' (2019) 98 *Scottish Historical Review* (Supplement) 410-438.

[77] Anon, "On Codification", (1873) *Journal of Jurisprudence* 17, 188, 190; '...codification, rightly understood, is the arrangement of materials which are to hand, with the elimination of all that is superfluous or injurious.'

[78] 1868 Regulations, Part 1, Title 2, Rule 1.

[79] 1868 Regulations, Part 1, Title 2, Rule 2.

[80] 1868 Regulations, Part 1, Title 3, Rules 3, 5 and 6 respectively.

[81] 1868 Regulations, Part 1, Title 3, Rule 7.

[82] 1868 Regulations, Part 1, Title 3, Rule 10.

[83] The suggested form of report is in 1868 Regulations, Appendix II, 14-6.

[84] 1868 Regulations, Part 1, Title 3, Rule 10.

[85] 1868 Regulations, Part 1, Title 3, Rule 13.

[86] H.B., [probably Hugh Barclay], 'Review: Report upon Uncertified Deaths in Glasgow', (1876) *Journal of Jurisprudence* 20, 302-5.

[87] (1876) *Journal of Jurisprudence,* 20, 304.

[88] *HM Advocate v Margaret McMillan* 1940 Justiciary Cases 62; 1940 Scots Law Times 420, considering the cause of death in the famous murder trial of Madeleine Smith in 1857.

[89] D Maclagan, "Forensic Medicine from a Scottish Point of View", (1879) *Journal of Jurisprudence* 23, 1 with Scotland discussed specifically at pp. 17-18. Also, the professor gives an insight into the state then of forensic medicine 'Medical Jurisprudence', (1881) *Journal of Jurisprudence* 25, 617-631.

[90] Anon, *The Coroners' Bill* (1879) *Journal of Jurisprudence,* 23, 313 at 313 – 314.

[91] Anon, *The Coroners' Bill,* 314–5.

[92] NRS: BR/NBR/4/2. This consists of the Accident Book itself and four lots of supporting papers.

[93] NRS: BR/NBR/4/2: Accident Book, pp. 166-171.

[94] Lumley, *Tay Bridge Disaster: The Peoples' Story*, p. 97; Gren, *The Bridge is Down*, pp.37-8. These professional men and their various assistants at different times were all on the payroll for Bouch: NRS GD266/238 and 239. These receipts for salaries were with the papers for the North British Railway Company which seems to suggest that, although recruited by Bouch, the source of their pay was that company. Moreover, their expenses included 'composition' tickets for the ferry from one side of the Tay to the other, and to Newcastle and Edinburgh, so that it was not a matter of mere presence in one place of professional Inspectors and their assistants.

[95] NRS: GD266/239, item 13 (20 December 1873). This suggests that Muir had started work (at £3 per week) at the end of November 1873, presumably having been recruited a short time earlier.

[96] Grothe, *The Tay Bridge,* ibid, p. 68.

[97] The deceased were identified in the newspaper account, *The Scotsman*, 27 August 1873, p. 4. From the names of the deceased mentioned in the newspaper the records of five deaths were found easily and they had been given the cause of death as 'accidental drowning': Dundee Registrar (St Peter district): 282/1/343 to 282/1/345,and 282/1/347 and 282/1/348.

[98] *The Scotsman*, 27 August 1873, p. 4.

[99] *The Scotsman*, 28 August 1873, p. 4.

[100] Grothe, *The Tay Bridge,* ibid, p. 68.

[101] *The Scotsman*, 28 August 1873, p. 4.

[102] Prebble, *The High Girders,* ibid., p. 61.

[103] Grothe, *The Tay Bridge,* ibid, pp. 68-9: *The Scotsman*, 21 September 1877, p. 3.

[104] *The Scotsman*, 5 February 1877, p. 5.

[105] *The Scotsman*, 5 February 1877, p. 5.

[106] *The Scotsman*, 19 September 1873, p. 4. Subscribers attended at an adjourned meeting and agreed to invest the undisclosed sum raised to date, with a committee to administer the investments. Yet, it had been found that the amount collected by that date was 'insufficient for the purpose contemplated, and the feeling was expressed that the public would still come forward and subscribe liberally.

[107] Grothe, *The Tay Bridge,* ibid, p. 8.

[108] Railway Regulation Amendment Act 1871 (c.78), s.6(1) and (4).

[109] Ian Henderson, 'The British Approach to Disaster Management: A Fresh Look at the Tay Bridge Disaster, 1879' (1998) 18(1) *Northern Scotland* 57-74, at p.65.

[110] Christopher Harvie, *A Floating Commonwealth: Politics, Culture, and Technology on Britain's Atlantic Coast, 1860-1930* (Oxford: Oxford University Press, 2008) p. 24.

[111] I.G.C. Hutchison, *Industry, Reform and Empire: Scotland, 1790-1880* (Edinburgh: Edinburgh University Press, pb. 2022) p.57.

[112] Hutchison, *Industry, Reform and Empire: Scotland, 1790-1880,* p.41.

[113] Oliver MacDonagh, *A Pattern of Government Growth, 1800-60* (London: MacGibbon & Kee, 1961), p. 320.

[114] MacDonagh, *A Pattern of Government Growth, 1800-60,* p 321.

[115] Anthon Murray, *The Forth Railway Bridge: A Celebration* (Edinburgh: Mainstream Publishing, 2nd ed., 1983), p.64.

[116] Murray, *The Forth Railway Bridge,* p.65.

[117] McKean, *Battle for the North*, ibid, at p.164, mentions ice flows covering the Tay at one point in 1878 during construction.

[118] National Records of Scotland: BR/NBR/10/11: letters dated 23 February 1880; 2 March 1880; and 3 March 1880.

[119] David Torrance, *A History of the Scottish Liberals and Liberal Democrats* (Edinburgh: Edinburgh University Press, pb., 2022), p. 13.

[120] I.A. Burney, *Bodies of Evidence: Medicine and the Politics of the English Inquest 1830-1926*, (Baltimore and London, The Johns Hopkins University Press, 2000), p. 171.

[121] That absence of an *intrusive* public hearing has been supported in the modern era by at least one member of the medical profession with experience in Scotland: M.T. Cassidy, "Forensic Pathology in Ireland and Scotland", (2002) 8 *Medico Legal Journal of Ireland* 23.

[122] I.A. Burney, 'Bodies of Evidence', 9 observes that: "In political terms, the age of the expert tends to be associated with the rise of bureaucratic and centralised administrative structures".

[123] In the three Glasgow infirmaries, for example, there were 198 operations in 1855 and by 1910 that had risen to 12,058: C.I. Pennington, "Mortality and Medical Care in Nineteenth Century Glasgow", *Medical History* 1979 October 23(4) 442-50 Table IV, 445.

[124] Confidentiality and secrecy imply different qualities, or degrees of the same sort of concept, and the former has been exhorted as desirable even in comparatively modern times when investigating deaths, although nearest relatives were considered and interviewed: JC Gardner, "Inquiry into Sudden Deaths in England and Scotland", (1946) *Juridical Review* 58, 209-216, 215.

[125] Robert S. Shiels, 'The origins of the fatal accident inquiry' 2017 *Scots Law Times* (News) 47-53.

[126] K. Theodore Hoppen, *The Mid-Victorian Generation, 1846-1886* (Oxford: Clarendon Press, 1998), p.289.

[127] Crawford Barlow*, The New Tay Bridge: A Course of Lectures* (London: E & F.N. Spon, 1889), p. 43.

[128] C. Hamilton Ellis, *The North British Railway*, (London: Ian Allan, 1955), p.121. It seems that accidents on constructing the Forth Bridge were 'frequent, in comparison with the new Tay Bridge': ibid, p.131.

[129] David Howell, *British workers and the Independent Labour Party 1888-1906* (Manchester, Manchester University Press, 1983), p.140.

[130] MacDonagh, 'Coal Mines Regulations', p. 86.

[131] Graeme Morton, *Unionist-Nationalism: Governing Urban Scotland, 1830-1860* (East Linton; Tuckwell Press, 1999), p. 25.

[132] Dundee City Archives: GD/TD/1: file 4. There are two rough copies of what the witness might say and a final precognition.

[133] Hutchison, *Industry, Reform and Empire: Scotland, 1790-1880,* p. 299.

[134] Bogdanor, *The Strange Survival of Liberal Britain,* ibid, pp.258-259.