

'Regulation run mad':

The Board of Trade and the loss of the *Titanic*

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'And so a rule which has become established by the safe practice of some 30 years is to be set aside because one exception has occurred in what are acknowledged to be exceptional circumstances. Surely this is regulation run mad The whole blame should have been placed on the bad look-out.' - Sir Alfred Chalmers, former Nautical Advisor, Board of Trade, 'Memo on the finding of the Court of the loss of the Titanic', c. August 1912, PRO MT9/920/425. Stress in original

' "Boats for all" [is] one of the most ridiculous proposals ever put forward' - R. D. Holt MP (partner in Alfred Holt & Co, shipowners), House of Commons, 7.10.1912

'The Board of Trade has got many eyes and many ears, but it does not seem to have any brains' – W. D. Harbinson, counsel for the third-class passengers, British inquiry transcript, p.738.

Abstract

Disasters often involve regulatory failure. Somebody was responsible for safety and failed to ensure it, through negligence or lack of imagination, or both. As part of an ESRC-funded research project on the Aberfan disaster of 1966, we are looking at regulatory failure in other British disasters, beginning with the *Titanic*, the century's best-known and deadliest peacetime disaster. This article revisits the causes of, and inquiry into, the loss of the *Titanic*. It illustrates how the disaster was an early example of the kind of injustice and regulatory failure that has often been central in more recent catastrophes. A regulatory body had, in effect, to inquire into its own shortcomings; therefore too little blame was laid in high places, and too much in low places. The *Titanic* report scapegoated the captain of another vessel, although the question of his blameworthiness was not read into the inquiry's instructions until after it had heard him. The shipping industry blocked any serious discussion of the disaster in Parliament.

Introduction

The history of the *Titanic* disaster has been the subject of a wealth of work ranging from the sensational to the academic. Investigations of some of the disaster's controversies have examined the questions of blame and responsibility.² Here we take that subject on by offering further evidence, analysis and parallels with later disasters. The core of this paper is an analysis of the preparation, writing, and reception of the UK official report on the disaster. We conclude by locating the *Titanic* disaster in the current literature on policy failure and regulatory capture.

The White Star liner *Titanic* struck an iceberg on her maiden voyage from Southampton to New York on the night of 14/15 April 1912. Two hours later she foundered in a flat calm sea with the loss of 1,490 lives; 711 people were saved.³ A US Senate investigation began on 17 April 1912; a UK Court of Inquiry, chaired by Lord Mersey, a retired Liverpool judge who had specialised in commercial cases, was set up on 23 April, but had to await the return of many witnesses from the USA. The surviving British crew of the *Titanic* were detained on return to Britain in order to extract their witness statements and, where appropriate, to hear their oral evidence. For some of them, this was their second detention. Their pay stopped when the *Titanic* sank. Both the US and the British authorities therefore took steps to detain the crew. The UK inquiry held 37 sittings; its report is dated 30 July 1912, and it was presented to Parliament on 1 August 1912.⁴

The Mersey Report and its reception

The Mersey Report proper is four lines long: 'The Court ... finds ... that the loss of the said ship was due to collision with an iceberg, brought about by the excessive speed at which the ship was being navigated'. The rest of the document is technically labelled an 'Annex' to the Report (but to avoid pedantry is called the Report in the rest of this paper.) It is designed to answer 26 questions, some of them in multiple parts, put to Lord Mersey by the Board of Trade. The material ones, with the Report's answers, are in Table 1. Where we quote a question or answer verbatim, it is enclosed in single quotation marks.

Table 1

Titanic: Board of Trade questions and Mersey Report answers

<i>Q. no.</i>	<i>Board of Trade question</i>	<i>Mersey Report answer</i>
2	'Did the <i>Titanic</i> comply with the requirements of the Merchant Shipping Acts...?'	'Yes'
3	'In the actual design and construction of the <i>Titanic</i> what special provisions were made for the safety of the vessel and the lives of those on board in the event of collisions and other casualties?'	Described in Report; regarded as satisfactory
5c	'Had a boat drill been held on board, and if so, when?'	No, because firemen refuse to get involved in boat drills
5d	'What was the carrying capacity of the respective boats?'	'1178'
6	Were the Marconi wireless arrangements satisfactory?'	'Yes'
7	Were the company's navigation instructions to the Master satisfactory, given the 'time of year and dangers likely to be encountered'?	'Yes, but having regard to subsequent events they would have been better if a reference had been made to the course to be adopted in the event of reaching the region of ice'
19a	Was the boat launching equipment in good order?'	'Yes'
19b	Were the boats launched correctly under appropriate supervision	'Yes'
20a-c	Analyse each boatload according to the proportion of crew, male and female passengers, and passengers in each class	Unable to do so because crew's evidence conflicts with that of the rescuers
20d	'Did each boat carry its full load and, if not, why not?'	'No ... for the following reasons:- 1. Many people did not realise the danger or care to leave the ship at first 2. Some boats were ordered to be lowered with an idea of their coming round to the gangway doors to complete loading. 3. The officers were not certain of the strength and capacity of the boats in all cases'
21f	'What reason is there for the disproportion if any' between the survival rates of different classes of crew and passengers?'	[See Tables 2-3]
24b	Did any vessel fail to assist in the rescue? [for origin of this question see text]	'The <i>Californian</i> . She could have reached the <i>Titanic</i> if she had made the attempt when she saw the first rocket. She made no attempt.'
24c	'Was the construction of the vessel and its arrangements such as to make it difficult for any class of passengers or any portion of crew to take full advantage of the existing provision for safety?'	'No'
26	'The Court is invited to report on the Rules and Regulations made under the Merchant Shipping Acts, 1894-1906 ... and to make any recommendations or suggestions that it may see fit ...'	[see text]

Several of the questions arose from survivors' reports, the earlier inquiry held by the US Senate, and press campaigns. When the Mersey Committee started work, the following facts were already common knowledge:

- although exceeding the number required by Board of Trade regulations, there were not enough boats to rescue all the passengers and crew;
- not all of the boats were full;
- many more women and children had survived than men; more deck crew than engineering or catering crew; and more first-class passengers than third-class
- several survivors had reported seeing the lights of a ship not far away, which they assumed would come to the rescue.

As to the differential survival rates, the Mersey Committee gives the following information.

Table 2⁵
Titanic: survival rates of passengers

Category	Survived	Died	Survival rate, %
1st class male	57	118	32.6
1st class female	140	4	97.2
1st class children	6	0	100
2nd class male	14	154	8.3
2nd class female	80	13	86.0
2nd class children	24	0	100
3rd class male	75	387	16.2
3rd class female	76	89	46.1
3rd class children	27	52	34.2
All passengers	499	817	37.92

Table 3
Titanic: survival rates of crew

Category	Survived	Died	Survival rate, %
Deck	43	23	65.2
Engine Room	72	253	22.2
Victualling	97	397	19.6
All crew	212	817	23.95
(Female crew included above:)	20	3	87.0)
Summary: passengers and crew	711	1490	32.30

Although far more third-class passengers died than first or second, the Court decided that they had not been deliberately obstructed. Their own counsel agreed with this position in his summing-up.

The President of the Board of Trade, Sydney Buxton, faced several sessions of angry Parliamentary Questions on the loss of the *Titanic*. The Board had, after all, passed the *Titanic* as fit to sail. On 21 May 1912, the Opposition moved to reduce Buxton's salary by £100. This was the usual parliamentary means of voting censure on a minister. It was talked out without a vote. On 7 October 1912, there was a Commons debate on the Mersey Report. This was likewise talked out without a vote, and Lloyd George, standing in for the Prime Minister H. H. Asquith, refused to provide Parliamentary time to resume the debate.⁶ The most important point raised in the Commons was that the Mersey inquiry might find the Board of Trade itself to blame: how then could it properly report to the Board of Trade 'if they find that the Board of Trade has been culpable'? Asquith intervened to say, 'There is no difficulty whatever.... They are perfectly entitled to find the Board of Trade culpable'. Later, Joseph Martin (Lib., St Pancras East; a former Premier of British Columbia) asked Buxton

whether, in view of the fact that the want of proper regulation for life-saving apparatus was the cause of the loss of many persons on the *Titanic*, he intends to suspend the head of the Marine Department of the Board of Trade and to reorganise that Department on a business basis?

Buxton replied that he would await the report. However, the debate on the report was first hijacked by vested interests and then talked out. So Buxton never had to answer that question.⁷

The critics had a point. The Report was commissioned by, and answerable to, the Board of Trade, which set its agenda by asking the 26 questions. The Board's reply, that although it requested Mersey he was actually appointed by the Lord Chancellor, hid behind a mere technicality.⁸ Mersey and his colleagues quickly found out that the Board's regulations under the Merchant Shipping Acts had not been updated since 1894. They merely prescribed lifeboat capacity (defined by volume in cubic feet, not by number of passengers) for an undifferentiated class of passenger ships larger than 10,000 tons. But since 1894 the size of the largest passenger ships had quadrupled. The *Titanic* was of 46,328 g.r.t (gross register tons, a measure of volume, not weight). She was over-equipped in relation to the regulations in force when she sailed, which would have required her to have lifeboats only for 962 people, instead of the actual capacity of 1178 (for a complement of 2201 passengers and crew on the fatal voyage, and authorised capacity of 3547).

The overt cause of the disaster, as identified in the four-line Report proper, was excessive speed in an area of icebergs. Mersey laid some of the blame on an inadequate lookout. Crew members who had been part of the lookout team told the inquiry that they had had binoculars for the empty trip from Belfast to Southampton, but that they had been taken away at Southampton, where the first passengers boarded. One member, Frederick Fleet, who spotted the iceberg, told the Counsel for the National Sailors' and Firemen's Union (Thomas Scanlan MP, Nationalist, N. Sligo) that had

White Star followed its normal practice of providing binoculars the disaster would have been avoided.

(Mr Scanlan) Do you think if you had had glasses you could have seen the iceberg sooner? – [Mr Fleet] Certainly.

How much sooner do you think you could have seen it? - In time for the ship to get out of the way.

So that it is your view that if you had had glasses it would have made all the difference between safety and disaster? – Yes.⁹

Yet Mersey concluded, after hearing the evidence of figures within the shipping industry, that, despite the lookout being insufficient, binoculars were not necessary. He blamed the number of crew placed on lookout rather than the actions of those in the crow's nest at the time.¹⁰

Regarding the *Titanic's* speed, Mersey found that the practice of all the shipping lines was, to put it crudely, to run like hell when they entered an area of icebergs. It had never led to an accident before. Therefore, although Mersey found that it was bad practice, and that the iceberg zone could be avoided by a change of course which would involve only 10 hours' more steaming time, he did not blame either the Captain of the *Titanic* (who was killed) or White Star (her owners) for the practice. Mersey concluded that J. Bruce Ismay, the White Star chairman who survived the sinking, had no influence on the ship's speed. In contrast, the US inquiry felt that while Ismay was not personally to blame, he may have unconsciously influenced Smith to travel at speed.¹¹ Thus Mersey held no one to blame for the reckless practice of speed in the vicinity of ice. However, the Report did conclude that 'What was a mistake in the case of the "Titanic" would without doubt be negligence in any similar case in the future.¹² No longer would there be the excuse that such recklessness was simply the norm.

The *Herald of Free Enterprise* sank in 1987 because the assistant bosun had failed in his duty to ensure that the bow doors were shut and the master had thus set sail with his ship in an unsafe condition. However, the Sheen Report into the disaster cast the blame far wider than the captain and individual crewmembers: 'a full investigation ... leads inexorably to the conclusion that the underlying or cardinal faults lay higher up in the Company.'¹³ The Mersey Report in contrast made some adverse comment on the captain and on the Board of Trade, but ultimately held no individual or corporate body responsible for the actual sinking despite shortcomings in practice, regulation and the law.

Mersey may have wished not to be too harsh on a deceased captain not there to defend himself and/or to protect an industry hampered by industrial unrest.¹⁴ Yet even had the Mersey Report looked for culprits there was no guarantee that it would have led to action. Establishing criminal negligence for killings by companies has long proved notoriously difficult. Maverick MP Horatio Bottomley raised the question of criminal proceedings against White Star in Parliament,¹⁵ but the experience of other disasters suggests that any action would have run into difficulties. The Senghennydd disaster of 1913, where 439 miners were killed, was blamed upon the failure to take precautions

common within the industry. However, most were not actually legally required since the relevant act had not yet come into force. Consequently, seven of the charges against the manager were dropped while he was acquitted of another five. He was found guilty of three essentially minor charges of failing to keep proper records and fined £24. As one local newspaper pointed out, this worked at just 1 1/4d for each miner's life lost.¹⁶ Aberfan (1966) and Hillsborough (1989) were followed by inquiries that laid the blame clearly at the feet of the NCB and police respectively.¹⁷ Yet neither led to public prosecutions. The Sheen Report's condemnation of Townsend Thoresen, the *Herald of Free Enterprise's* owners, and an unlawful killing verdict at the inquest did lead to manslaughter charges but they failed on what was essentially a technicality.¹⁸

The standard of proof required in a civil case is lower than that in a criminal one. In 1913, a British jury found White Star negligent for excessive speed in a compensation case and awarded the claimant, whose deceased son had been a third class passenger, £100. This decision was upheld by the Court of Appeal leading White Star to settle the US cases out of court in 1916. The company agreed to pay a total of \$2,500,000, to be divided pro rata between the American claimants. The maximum sum was fixed at \$50,000 (approximately £10,417) for the death of a first class passenger and \$1,000 (approximately £208) for a migrant passenger.¹⁹ The inequalities of class were not unique to Britain.

Thus in contrast to the Mersey Report, the settlement of compensation claims entailed placing the blame on White Star. Ismay's career was ruined by the *Titanic*, yet neither he, his employees nor his company suffered a criminal prosecution that would offer the justice sought by so many later disaster victims. Victims who receive financial compensation still often feel ill treated by the law. They seek not revenge or money but justice.

Of mystery ships and scapegoats

The sinking of the *Titanic* produced powerful cultural resonances about class, technology and heroism that ensured its fame has been enduring.²⁰ More recently that fame has been given added impetus by James Cameron's epic Hollywood film. Integral to the continued interest in the disaster has been the question of who was to blame for the disaster. Both the Mersey report and US inquiry offered an alternative culprit: a mysterious ship seen by passengers and crew on the *Titanic* to whose assistance it never came. The controversy over the role of the *Californian* has raged ever since.

Mersey devoted a chapter of his report to the SS *Californian*, a British cargo steamer which was immobile in field ice at the time of the disaster. Shortly before the disaster, her wireless officer radioed the *Titanic* to report that she was stopped and surrounded by ice. The *Titanic's* operator responded 'Keep out' [i.e., go off air] because *Titanic* was trying to send messages to a remote shore station. The *Californian's* sole wireless officer then went to bed. (The Board of Trade had not yet issued any regulations to govern the new technology of wireless telegraphy). Later that night her crew saw eight flares from a distant vessel. Captain Lord of the *Californian* said that he believed it was a vessel of about the size of his own, namely 6223 tons. When the vessel's

lights disappeared, the crew of the *Californian* assumed that she had steamed out of sight. The *Californian* recorded her position as 19 miles away from the *Titanic* at the time of the disaster. Mersey was 'satisfied that this position is not accurate'; concluded that she was only eight to ten miles away, and that if she had gone to the scene, the *Californian* 'might have saved many if not all of the lives that were lost'.²¹

There is a crucial ambiguity in that final sentence. 'Many if not all' has two opposite meanings: 'many, but not all', and 'many, and perhaps all'. Did Mersey really mean to say that if the *Californian* had reached the scene before the *Titanic* went down, she might have saved the lives of all of those on board? Sir Alfred Chalmers, former Nautical Advisor to the Board of Trade, wrote a long self-justifying memorandum after the Mersey Report was published. For the most part, he replied to Mersey's blaming him by attacking the report. But, on the *Californian*, he concurred with the Report, saying 'Had it not been for the inexplicable misapprehension or apathy of the Officers of that vessel an effective rescue of all would have been possible within an hour or so of the mishap'.²²

However, this is wildly implausible, given that there were 1178 boat places for a complement of 2201, that the *Titanic* had stated her position incorrectly, and that the upper decks of the *Titanic* were 60 feet above the sea. It was, to say the least, careless of Lord Mersey to use the casual and ambiguous phrase 'many if not all' at the end of the chapter on the *Californian*. For the rest of his life, the Master of the *Californian* struggled to clear his name, asserting that he had given his correct position. There are many candidates for the 'mystery ship' seen by *Titanic* survivors. A dozen ships are known to have been in the vicinity, some with radio, some not.²³ One was a Norwegian whaler, *Samson*. Her first mate claimed in 1962, shortly before his death, that she had kept silent that night because she was engaged in illegal fishing, and thought the *Titanic*'s distress rockets were from a fisheries protection or other official vessel.²⁴ Also, there was evidence available to Mersey, and some more which arrived soon after his report was published, to show that a Canadian steamer, the *Mount Temple*, was much more likely than the *Californian* to have been the 'ship which stood still'.

Two attempts to reopen the case in the 1950s came to nothing. However, in 1985, the wreck of the *Titanic* was found, about 13 miles away from the position that the Mersey Report believed her to have sunk. This of course reopened doubts about the relative positions of *Titanic* and *Californian*. In 1990, the Secretary of State for Transport finally requested a 'reappraisal of the evidence relating to SS *Californian*'. The Department of Transport's Marine Accident Investigation Branch (MAIB) first commissioned a report from an independent expert. However, the Branch disagreed with some of the expert's conclusions, and its report contains both sets of contradictory conclusions.²⁵ The two ships were either about eight miles apart (as found in 1912, and by the outside investigator), or about 18 miles apart (as found by MAIB). The ship seen by the *Californian* either was or was not the *Titanic*. If it was, it was possibly as a result of super-refraction associated with temperature inversion, which may allow objects below the visible horizon to be seen. The difficulty for the 1912 inquiry and the 1992 independent inspector is that the crew of the *Californian* had a ship in view from about 23.00 until about 02.00 ship's time. Survivors from the *Titanic* reported a ship in view from about 00.30 ship's time until the *Titanic* sank at

about 02.30.²⁶ Ship's time, in 1912, was set by solar observation at noon each day, therefore it could vary significantly between ships. However, the *Titanic* and the *Californian* had been sailing in the same direction and on similar bearings, so their times differed by only about ten minutes. Therefore, if the *Californian* saw the *Titanic* only about five miles away from at least the moment of impact, why on earth did nobody on *Titanic*, including crew who would have been desperately scanning the horizon for any other vessel, report seeing another ship until about 00.30? The *Californian* undoubtedly did see the *Titanic's* distress rockets and should have gone to help. But the 1992 inquiry's most important finding is this: *Even if the Californian had gone to help as soon as she had confirmed the sight of distress rockets, she would not have reached the scene until about the same time as the actual rescuing ship, about two hours after the sinking.* The Mersey Report's conclusion that 'many if not all' lives would have been saved is therefore wrong on either reading of its meaning.²⁷

On the 24th day of the hearings, the Attorney General, Sir Rufus Isaacs, suggested that the questions under consideration should be amended so as to consider directly the role of the *Californian*.²⁸ Mersey accepted the suggestion and the following was inserted into question 24 of the Inquiry's remit: 'What vessels had the opportunity of rendering assistance to the "Titanic" and, if any, how was it that assistance did not reach the "Titanic" before the ss. "Carpathia" arrived?' In making this suggestion the Attorney General was creating a situation where the *Californian* could be directly criticised for the loss of life. Yet its captain had already given evidence and was thus unable to answer the subsequent allegations. Although a Formal Investigation is not a court, the procedure of inserting the question after the witness had been heard was so irregular that had it occurred more recently Captain Lord would have won a judicial review of the reasonableness of the investigation.

Sir Rufus Isaacs had an agenda as a member of the Government and another one as a private citizen. Neither served the public interest. As a member of the government, he had an interest in deflecting blame from the Board of Trade, or any other arm of the UK government, to any convenient scapegoat. The *Californian* had already been so identified in the US inquiry. Lord Mersey was willing to go along with the extraordinary procedural device of adding a question after the material witness had already been heard, because the transcript shows that he, too, had convinced himself of Lord's guilt.²⁹ As a private citizen, Isaacs held a large block of shares in the American Marconi Company, whose shares would become more valuable, the more he was able to show that Marconi wireless had saved lives, and its extension would save more. Hence, whereas the American inquiry had questioned Guglielmo Marconi very sharply over his role in restricting information from the disaster in order to maximise his employees' windfall profits, Isaacs asked Marconi only a sequence of respectful questions.³⁰

In contrast to the treatment handed out to the *Californian*, the *Mount Temple*, another ship closer to the *Titanic* than was the *Carpathia*, escaped censure. A sworn affidavit by one of its passengers claimed that

Several of the stewards and passengers ... informed him that word had been received by wireless from the *Titanic* that the *Titanic* had struck an iceberg and was calling for help. Orders were immediately issued and the *Mount Temple*

course changed, heading straight for the *Titanic*. About 3 o'clock, 2 o'clock ship time, the *Titanic* was sighted by some of the officers and crew; as soon as the *Titanic* was seen all lights on the *Mount Temple* were put out and the engines stopped and the boat lay dead for about two hours....³¹

This document was in print before Mersey reported. Neither Senator Smith nor Lord Mersey makes any use of it; it was not even put to the *Mount Temple*'s captain at the UK inquiry, despite his confusion over his ship's position at the time of the disaster. With the *Californian* already in place as a scapegoat, Isaacs did not need another.

In August 1912 Captain Lord's trade union sent another piece of *Mount Temple* testimony to the Board of Trade; it is now in the Public Record Office. It is a letter to Lord from W.H. Baker, an officer on the *Mount Temple* immediately after the disaster. Baker wrote:

The officers and others told me what they had seen on the eventful night when the *Titanic* went down, and from what they said, they were ten to fourteen miles from her when they saw her signals. I gather from what was told me that the captain seemed afraid to go through the ice although it was not very thick. They told me that they not only saw her deck lights but several green lights between them and what they thought was the *Titanic*.... The captain said at the Washington inquiry that he was forty-nine miles away but the officers state he was not more than fourteen miles off. I must tell you these men were fearfully indignant that they were not called upon to give evidence at the time, for they were greatly incensed at the captain's behaviour in the matter.³²

Despite this new evidence being made available to the Board of Trade immediately, it was another eighty years before the *Californian*'s case was reopened. Even then, the Department of Transport inquiry did not investigate the position of other ships, and makes no mention of the *Mount Temple* or of either of these documents.³³

Culpable partners: The Board of Trade and the shipping industry

Neither the real nor the alleged failings of the *Californian* exonerate the Board of Trade or the industry. The Board of Trade's questions for the Inquiry gave Mersey only a small opportunity to implicate the Board itself directly (Q. 26) and no opportunity to implicate the industry as a whole. Mersey nevertheless did investigate the Board's inaction. He found four reasons why the rules had not been changed to require boat places for all on board. One was sheer inertia: the Board had not got around to consulting on new regulations until 1911, although the vastly increased size of ships since the regulations were drafted in 1894 was common knowledge. ('I thought it was neither right nor the duty of a State Department to impose regulations on that mode of travel as long as the record was a clean one'.³⁴) The second was that the industry had designated Atlantic shipping lanes for each direction, hoping that vessels would be close enough to go to one another's rescue in the event of trouble. This consideration made the role of the *Californian* important in the question of the Board of Trade's responsibility. (But to designate lanes without either making rules to ensure that all ships had 24-hour wireless cover, or that distress rockets were a

different colour to other signals, turned out to be fatally complacent). The third was that the industry had objected to putting more boats on large ships, on the grounds that they were not prepared to take on extra crew to operate them. (In the light of the total crew complements of the day, this seems an oddly inflexible position). Fourthly, the experts believed that the bulkhead and double hull layout of a ship such as the *Titanic* made her unsinkable 'so ... that in the event of a disaster she would be her own lifeboat'.³⁵ Yet even after taking all this into account, Mersey failed to place a share of the blame firmly upon the Board of Trade. He concluded that, even had the boat regulations been updated, it was doubtful whether more lives would have been saved since the Board would probably not have demanded more boats than were actually carried. Although Mersey reasoned this was no excuse for the delay, he still did not condemn the Board for its failure to foresee the shortcomings in regulation.

Officials at the Board of Trade quickly realised that the lifeboat regulations were in need of updating and could leave them open to criticism. The Board's solicitors' department wrote:

I consider it necessary that our Counsel should have a lucid explanation of the reasons why these Rules more especially as regards boat accommodation were not altered from 1894 until now. ... It does not seem to me to be sufficient to say that a system has been adhered to; what the Court will want to know is why it was adhered to and whether it ought to be adhered to?³⁶

Thus the Board happily latched onto a letter it received from Professor J. H. Biles of Glasgow University that put the blame firmly on design defects relating to the ship's bulkheads.³⁷ Bulkhead regulations were drawn up by a committee partly composed of external experts thus exonerating the board in part, at least. Biles was consequently appointed by the Home Office as one of the Court of Inquiry's assessors. Given how his views on the disaster benefited the Board of Trade, it is likely that someone at the Board influenced the appointment. Mersey's final recommendations regarding bulkheads were essentially the same as those made by Biles in his initial letter.³⁸

Chalmers, in his defence of the Board and himself, argued that the whole lifeboat issue was irrelevant since more boats would not have saved more lives because there would not have been the time or crew to fill and man them. The existing lifeboats were, after all, not filled to capacity, despite the calm sea the evacuation operation took place in. The disorganisation in the filling of the lifeboats that was identified by the US inquiry cast doubts on this claim.³⁹ The comments of the Board of Trade official at Southampton who had passed the *Titanic* fit to sail reveal further failings in the Board's regulation:

In conclusion I would respectfully add that it is not all uncommon recurrence to find at our Emigration Clearances ABs' [able seamen] wholly incompetent to row in even a moderate weather and sea, but (prior to loss *Titanic*) to reject such men on the score that they cannot handle an oar would I most respectfully suggest have annoyed the Shipowner and perhaps led to litigation.⁴⁰

Chalmers argued that the Mersey and his committee appeared to have 'surrendered their common sense and experience to the hysterical panic of a public, notoriously

impatient of endurance and hardship, and childishly timorous in matters involving the slightest of risk to life.’ The Board may have ultimately given in to public pressure and conceded boats for all but Chalmers’ dismissal of the Mersey Report and the comments of the Southampton surveyor betrays the matter at the heart of the Board’s regulatory failure. It felt it had a monopoly of wisdom over what constituted reasonable practice and was reluctant to listen to external opinions. Its priorities were to the shipping industry rather than the safety of the public.

‘I wish to say that the Board of Trade has got many eyes and many ears, but it does not seem to have any brains’ said the Counsel for the third class passengers in his summing up.⁴¹ The Board may have disagreed but the deepest failures identified in the Report are, as so often in disaster inquiries, failures of imagination. Ship designers, operators and regulators had never conceived of such a thing happening. The *Titanic* was believed to be able to act as her own lifeboat because her design of bulkheads and watertight doors was expected to survive any holing. In the event, Mersey concluded, ‘The *Titanic* as constructed could not have remained afloat long with such damage as she received’.⁴² But he attaches no blame to her designers or builders, presumably because everybody thought the same, and everybody was wrong.

If the British inquiry was flawed because of its relationship with the Board of Trade, then surely the US inquiry would have reached different conclusions? The US Senate inquiry was chaired and inspired by Senator William Alden Smith, a populist and isolationist Republican from Michigan. Mid-western populists and Progressives were the bitterest opponents of what they called ‘trusts’, that is, industrial cartels. Over and above the human tragedy, Smith saw his inquiry as an opportunity to attack the Anglo-American shipping combine that owned White Star and other lines. Ismay and members of the crew were detained leaving them no option but to co-operate.⁴³ There was immediate concern within the British government regarding the US inquiry. Did it have the authority to inquire into the loss of a British ship? Were British subjects being held against their will? Would it impinge on the Board of Trade inquiry? Was Smith (who was, in the opinion of the British Ambassador, ‘a person always anxious to put himself forward where any passing notoriety can be achieved.’) suitable to head the inquiry? Such questions dominated communications between the British Embassy in Washington and the Foreign Office on the disaster.⁴⁴ Nonetheless, the US inquiry proceeded without British interference. James Bryce, the British Ambassador in Washington, believed that the ‘conduct of the enquiry is so incompetent that they may before long discredit themselves and public interest may subside.’⁴⁵

The final report criticised the Captain’s indifference to the possible danger of ice, the organisation of the escape in lifeboats, and the inaction of the *Californian*. It concluded that Ismay’s presence had subconsciously encouraged the Captain’s excessive speed.⁴⁶ Thus the report was notably harsher than the British inquiry it preceded. The criticisms were directed at the shipping industry but the Board of Trade’s role did not go unnoticed. In his speech accompanying the report, Smith said ‘we shall leave to the honest judgement of England its painstaking chastisement of the Board of Trade to whose laxity of regulation and hasty inspection the world is largely indebted for this awful fatality’.⁴⁷

But, like Lord Mersey and Sir Rufus Isaacs, Senator Smith had an agenda. The Populist movement tended to be anti-British, responding to the views of the waves of emigrants who had no reason to love the British. Although not as outspoken as the US popular press (one New York paper headlined a story 'J. Brute Ismay' in large letters), Smith was able to find plenty of evidence to confirm the Populist conception of Britain as stuffy, arrogant, and class-bound. Like Mersey, Smith made a scapegoat of Captain Lord of the *Californian*. This entailed ignoring the remarkable *Mount Temple* affidavit, although it was read into the record. It was thus available to Mersey, but never used. The Canadian master of the *Mount Temple* was heard respectfully at both inquiries and faced no hostile questions. Could it be that nobody hated the Canadians?

Although some information uncovered by the US inquiry could not be ignored by the British inquiry, the Mersey Report never provided Smith's 'chastisement'. C. H. Lightoller, the second officer on the *Titanic* and the most senior officer to survive the disaster, freely confessed in 1935 that he saw his role at the Mersey inquiry as being to defend White Star against various accusations, some of them justified (for which, he said, he got no thanks from the management).

A washing of dirty linen would help no one. The B.O.T. had passed that ship as in all respects fit for sea, in every sense of the word, with sufficient margin of safety for everyone on board. Now the B.O.T. was holding an enquiry into the loss of that ship – hence the whitewash brush. Personally I had no desire that blame should be attributed either to the B.O.T. or the White Star Line, though in all conscience it was a difficult task, when handled by some of the cleverest legal minds in England, striving tooth and nail to prove the inadequacy here, the lack, there, when one had known, full well, and for many years, the ever present possibility of such a disaster. I think in the end the B.O.T. and the White Star Line won.⁴⁸

Mersey, a conscientious man, may not have viewed his report as a whitewash but is difficult not to consider it, at least partly, in such a light.

Prime Minister Asquith said, in reply to a Parliamentary question, that it was an insult to Mersey to suggest that he might be influenced by the Board,⁴⁹ but nonetheless the inquiry was operating within terms laid down by the Board itself. The emphasis of the final Report was therefore never clearly on the shortcomings of the Board's regulation. Nor was Mersey himself perhaps as independent as Asquith claimed. Whatever his personal qualities and diligence, he remained a man connected with those he was investigating; the industry, through his work on shipping business and maritime law, and the establishment, through his peerage and personal life. As Davie points out, there is no evidence of collusion with the Board of Trade or fabrication or suppression of information,⁵⁰ instead any bias must have been subconscious. The case thus illustrates the importance of a thoroughly independent inquiry. Although more than eighty years ago, this lesson has not necessarily been learnt. Police forces are responsible for investigating the alleged criminal failures of their peers. Consequently, after the Hillsborough disaster there were serious concerns over the failure to institute criminal proceedings.⁵¹

Of the two Parliamentary debates on the *Titanic*, the first - held before Mersey had reported - was the more enlightening. An MP with mercantile marine experience pointed out that if the sea had not been flat calm, the death toll would have been far higher. If the ship had been rolling, boats launched from high above sea level would have been dashed against the side and destroyed. If she had been listing, none of the boats on the side opposite to the list could have been launched.⁵² These points (shown again many times since, most recently with the sinking of the *Herald of Free Enterprise*) prove that boats for all are not a sufficient safety precaution. They do not disprove that they are a necessary one. However, the first four speakers in the October debate were all from the shipping industry. They spoke, not on the Mersey report, but on a White Paper that Buxton had introduced after the disaster in order to tighten the regulations. The debate was opened by Leslie Scott (U., Liverpool Exchange), who announced that he spoke 'in a representative capacity on behalf of the whole shipping industry', including the Merchant Shipping Advisory Committee of the Board of Trade. As that Committee was a prime culprit for complicity in the disaster,⁵³ the industry was effectively getting its retaliation in first. The second speaker, (Richard Holt, Lib., Hexham; partner in Alfred Holt & Co, shipowners) described 'boats for all' [as] one of the most ridiculous proposals ever put forward'. Several speakers complained that if British ships were subject to tighter regulation, this would merely give a trading advantage to foreigners.

The industry arguments were weak. The Navy had, at least theoretically, provided boats for all for thirty years. British regulations could be imposed on foreign vessels by being applied to any vessel that docked in a UK port. This had happened with the Plimsoll line regulations. 'We remember well the Plimsoll load line and its prejudicial effect on our mercantile marine', said the retired admiral Lord Charles Beresford (U., Portsmouth) in the first debate, before spoiling his case by pointing out that the Plimsoll regulations had been enforced on foreign ships in just that way.⁵⁴ Holt's call for the industry to be allowed to regulate itself was derided by non-industry speakers. And the patriotic argument for protecting British ships ignored the reality that much of the Anglo-American trade belonged to a UK-US cartel, which owned both the White Star Line, owners of the *Titanic*, and the Leyland Line, owners of the *Californian*.

However weak these arguments, they served the purpose of using up debating time. By the time the Radical Liberal W. M. R. Pringle got up to complain that the debate up to then had been hijacked by representatives of the shipping industry, the time available for debate was half gone. The debate petered out without a vote. No identifiable individuals, except the crew of the *Californian*, were held responsible for the *Titanic* disaster.⁵⁵ Buxton got the industry to agree to put lifeboats for all on their ships, but they unrepentantly blocked any suggestion that they were to blame. Joseph Martin's implication that all would have been well if regulation had been on a business basis is 180 degrees from the truth. On the evidence of the Parliamentary debates, so is the suggestion, made by many people at the time, that there should have been a Parliamentary inquiry instead of one reporting to the Board of Trade. As after the report of the Aberfan disaster tribunal 55 years later, neither Parliament nor the industry protected the public.⁵⁶

Indeed, 'the public', even in the shape of *Titanic* passengers and victims' relatives, had difficulty in letting themselves be heard at all. Lord Mersey initially admitted only

counsel for White Star, for the National Sailors' and Firemens' Union, and for the Chamber of Shipping of the United Kingdom. He sought, and got, the approval of the Attorney-General (Isaacs) and of counsel for White Star to admit the union and the trade association, and to exclude other parties.⁵⁷ On the fourth day, with a bad grace, he admitted counsel for the third-class passengers as a group, while insisting that the inquiry was not a court, and that therefore he would not hear allegations of manslaughter in cases where individuals had apparently obstructed victims.⁵⁸ Gradually during the hearings, counsel for other parties, including other unions and the owners of the *Californian*, appeared, but they were not allowed in at the beginning. Lord Mersey and Rufus Isaacs took a very corporatist view of who should have the right to ask questions. Mersey treated a request by frequent transatlantic passengers to be represented as 'one of the strangest' he had heard.⁵⁹

Conclusion: the legacy of the *Titanic*

In 1993, Neil Hamilton MP (Parliamentary Under-Secretary of State, DTI) alleged that 'Our response to recent large scale disasters has been out of all proportion to the disasters themselves.' He was referring to the cost of the regulations implemented after tragedies such as the King's Cross fire (1987) and the sinking of the *Marchioness*. Hamilton saw disasters as exceptions that did not warrant regulatory responses that would unduly burden industry. Speakers representing the shipping industry in the Parliamentary *Titanic* debates would have agreed with his assertion that 'we have to ask ourselves whether the costs of regulation are proportionate to the risk. After all risk is an essential part of life.'⁶⁰

Risk may be part of life but that hardly excuses failures on the part of regulatory bodies to minimise it. Regulation of industry in twentieth century Britain has too often been primarily concerned with the interests of the regulated rather than of the consumer. The litany of disasters from the *Titanic* to Aberfan through to cluster of tragedies in the 1980s is evidence of the catastrophic consequences for the public. Yet even after disaster strikes, regulatory failures continue in the process of investigation and blame. That no one was held responsible, beyond compensation payments, for the loss of the *Titanic* was not unique. Be it because of the shortcomings of the inquiry process or those of criminal law, corporations and individuals responsible for disasters too often escape uncensored.

Our findings are entirely consistent with those of others who have looked at policy disasters and/or at regulatory failure. Gregory, applying the framework developed by Bovens and 'tHart to the 1995 Cave Creek disaster in New Zealand, shows that neither 'forward mapping' (from policy making to implementation to disaster) nor 'backward mapping' (in the opposite direction) permitted an appropriate assignment of blame in that case.⁶¹ There is a huge literature, mostly from economics, on regulatory failure. Briefly, economists expect regulators to operate in the interests of the regulated industry, rather than in the public interest when that can be identified. In earlier work, we and others have shown that UK industry regulation in the 19th century fell into this trap, despite the stalwart attempts of W. E. Gladstone to keep railway regulation out of the hands of the railway industry.⁶² Regulation by Parliament does not seem to work either. Parliamentary debates are typically captured by the producer interest in question. As well as with the *Titanic*, this happened after Aberfan⁶³ and in the 1844 debates about Gladstone's proposals for railway regulation.⁶⁴

There is a lively debate between the merits of self-regulation and those of regulation by Government agency. Our case (like those highlighted by Woolfson⁶⁵, Gregory, and numerous other writers) displays the special problems of self-regulation *by* a Government agency. The Board of Trade was all but judge in its own case. Sir Rufus Isaacs and his team were described not as ‘counsel for the Inquiry’ but as ‘counsel on behalf of the Board of Trade’.⁶⁶ At many points he ran the inquiry, dragging a complaisant Lord Mersey along with him. Small wonder that the Board of Trade escaped lightly.

The legacy of the *Titanic* may have been boats for all (and the International Ice Patrol), but it should have been more than that. Shutting the stable door after the horse has bolted may prevent the next horse escaping but in all likelihood the next disaster would be something different.⁶⁷ The lessons regarding the Board of Trade’s inappropriate regulatory priorities before and after the disaster went largely unheeded. To this day, public safety is not always at the forefront of the activity of regulators. The cost has been the repeated loss of life in avoidable disasters.

² In particular see Robert D. Ballard *et al.*, *The Discovery of the Titanic* (New & updated ed. London : Orion, 1995); Michael Davie, *The Titanic: The Full Story of Tragedy* (London: Bodley Head, 1986); R. Gardiner and D. Van der Vat, *The Riddle of the Titanic* London : Weidenfeld and Nicolson, 1995); Department of Transport, Marine Accident Investigation Branch, *RMS "Titanic": Reappraisal of evidence relating to SS "Californian"* (London: HMSO, 1992).

³ Because of the lack of passenger records, the (curious) failure of the *Titanic*’s log to survive, and discrepant accounts of survivors and rescuers, there remain minor discrepancies among different sources as to the number of survivors and victims. We use the numbers reported by the Mersey Tribunal.

⁴ Mersey, Lord (chairman), (1912) *Report of a Formal Investigation into the circumstances attending the foundering on 15th April, 1912, of the British steamship "Titanic," of Liverpool, after striking ice in or near Latitude 41° 46' N., Longitude 50° 14' W, North Atlantic Ocean, whereby loss of life ensued* London: HMSO, Cd 6352. (hereafter Mersey Report, p.2; *Hansard* 5th ser. 37:1521 (crew detention); 41:2220.

⁵ Source for tables 2 and 3: Mersey Report, p. 70; some figures regrouped.

⁶ *Hansard* 5th ser 42: 1057-8.

⁷ *Hansard* 5th ser 37: 1091 sqq; 1865 sqq; 2058 sqq; 38: 39 sqq, 1757 sqq; 42: 32 sqq, 1057. Quoted at 37:2060 (PQ by Major Archer-Shee, reply by the Prime Minister), and at 38:41 (PQ by Mr Martin and reply by Buxton).

⁸ Public Record Office (PRO) MT 9/920/B.

⁹ Wreck Commissioner’s Court, *Formal Investigation into the Loss of the S.S. "Titanic"*, Minutes of Evidence, part 4, qq. 17401-17403, p. 390. Another member of the lookout crew claimed that he and others had unsuccessfully asked for the binoculars to be replaced. George Alfred Hogg, Minutes of Evidence, qq. 17505-17511, p. 393.

¹⁰ Mersey Report, p. 64

¹¹ Ismay was one of only two passengers mentioned by name in the Report, the other being Sir Cosmo Duff Gordon. Both had been accused of dishonourable practices (pushing into a lifeboat ahead of women and children; bribing crewmembers not to row back to pick up survivors). Both were exonerated by Mersey. James Cameron’s movie however depicts Ismay asking Smith, the captain, to travel faster.

¹² Mersey Report, p. 30.

¹³ *MV Herald of Free Enterprise, Report of the Court, No 8074*, Dept of Transport 1987, para. 14.1.

¹⁴ Davie, *The Titanic*, p. 184.

¹⁵ *Hansard*, 5th ser. 37, col. 1204. Written Q by Mr Bottomley.

¹⁶ Michael Lieven, *Senghennydd, the Universal Pit Village, 1890-1930* (Llandysul: Gomer, 1994), p. 264.

¹⁷ H. E. Davies (chairman), *Report of the Tribunal appointed to inquire into the Disaster at Aberfan on October 21st, 1966* HL 316 and HC 553 London: HMSO 1967, Taylor, Sir Peter, *The Hillsborough Stadium disaster, 15 April 1989: inquiry by the Rt. Hon Lord Justice Taylor: final report* Cm 962 London: HMSO 1989. A private prosecution against the senior police officers responsible at Hillsborough is proceeding at the time of writing.

¹⁸ See Celia Wells, *Negotiating Tragedy: Law and Disasters* (London: Sweet & Maxwell, 1995), p. 32.

¹⁹ 29 Times LR 629, 30 Times LR 302. Also see Gardiner & Van der Vat, *Riddle*, p. 325 & Davie, *Titanic*, pp. 184-185.

²⁰ See Steven Biel, *Down with the Old Canoe: A Cultural History of the Titanic Disaster* (New York: W.W. Norton & Co., 1996).

²¹ Mersey Report, ch. 5, quoted at pp. 43, 46.

²² PRO MT9/920/425.

²³ See list in Gardiner & van der Vat, *Riddle*, pp. 367--8.

²⁴ *Ibid.*, pp. 186-187.

²⁵ Department of Transport, Marine Accident Investigation Branch, *RMS "Titanic": Reappraisal of evidence relating to SS "Californian"* (London: HMSO, 1992).

²⁶ Fleet, the lookout, first saw a light on port bow at about 1 am, He saw nothing while on duty up to midnight. Wreck Commissioner's Court, *Formal Investigation into the Loss of the S.S. "Titanic"*, Minutes of Evidence, part 4, day 15, pp. 390-391, qq. 17428-17435.

²⁷ The controversy over the *Californian* has not abated. For an unsympathetic view, see, e.g., the website -home.earthlink.net/~hiker1217/Frameset.html. But this does not address the discrepant times; the MAIB finding as to the ability of the *Californian* to reach the site before the *Titanic* sank; or the case against the *Mount Temple*.

²⁸ UK inquiry, Minutes of evidence, part 6, day 24, p. 611, speech by Isaacs: '[T]he only question which should be added is one relating to what I may call compendiously the *Californian* incident. There is no question in the twenty-six before you which would cover that.... [I]t is important that the question should be specifically put'.

²⁹ UK inquiry, Minutes of evidence, part 6, day 24, p. 611, comments by Commissioner..

³⁰ The US interrogation of Marconi is most conveniently found in T. Kuntz (ed.), *The Titanic disaster hearings : the official transcripts of the 1912 Senate investigation* (New York: Pocket Books, 1998) pp. 243-249 (Day 6). The British interrogation is in UK inquiry, Minutes of Evidence, qq. 24850-956, pp. 671-675, day 26.

³¹ Affidavit by Dr F.C. Quitzrau presented to the US Senate inquiry, appended to evidence, Day 14, as quoted by Gardiner and Van der Vat, *Riddle*, p. 182.

³² W. H. Baker to S. Lord, August 1912. PRO MT 9/920F, as quoted by Gardiner and Van der Vat, *Riddle*, pp 180—1.

³³ MAIB, *Reappraisal*.

³⁴ Sir Alfred Chalmers, quoted in Mersey Report, p. 49.

³⁵ Mr Archer, Principal Ship Surveyor, Board of Trade, in Mersey Report, p. 50.

³⁶ BoT Memo, 6 May 1912. PRO MT 9/920 B.

³⁷ PRO MT 9/920 B, 21 April 1912.

³⁸ Davie, *Titanic*, p. 180.

³⁹ The problems in evacuating of the ship can also be related to regulatory failure by the Board of Trade. The Board's assessor in Southampton claimed that White Star firemen (but not those of other companies) had been unwilling to take part in evacuation drill practice during its inspection of a ship. He admitted that he felt that this was unsatisfactory before the sinking but had allowed it because it was the custom. As with so many disasters, it took a tragedy for a regulator to take action to rectify a practice that it knew to be potentially unsafe. UK inquiry, *Minutes of Evidence*, pp. 640-641, qq. 24155-24174.

⁴⁰ M. H. Clarke (BoT surveyor's office, Southampton) to Ass Sec, Marine Dept, BoT, 12 May 1912. PRO MT 15/142.

⁴¹ W. D. Harbinson, UK Inquiry, *Minutes of Evidence*, p. 738.

⁴² Mersey Report, p. 34.

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- ⁴³ Ismay had planned to sail straight back to the UK after arriving in the USA aboard the *Carparthia*, the ship which picked up the *Titanic* survivors. However, his wireless messages were intercepted by the US Navy and, upon arriving in the States, he was visited by Smith leaving him little choice but to stay and co-operate. Ismay's desire to make a quick get-away has fuelled speculation over his blameworthiness in the disaster.
- ⁴⁴ See PRO FO 115/1710 & FO 369/522. Quote from British Ambassador to Foreign Secretary, 19 April 1912, FO 115/1710. Further summaries of the evidence can be found in Davie, *Titanic*, pp. 155-157.
- ⁴⁵ James Bryce, British Ambassador, 22 April 1912, PRO FO 115/1710.
- ⁴⁶ US Congress, Senate, *Report of the Senate Committee on Commerce pursuant to S. Res. 283, Directing the Committee to Investigate the Causes of the Sinking of the 'Titanic', with speeches by William Alden Smith and Isidor Rayner, 62d Cong., 2d sess., 28 May 1912, S. Rept. 806 (6127)*, Washington, Government Printing Office.
- ⁴⁷ Reported in letter from British Embassy, Washington to Foreign Secretary, 12 May 1912, PRO FO 369/522.
- ⁴⁸ Comdr. Lightoller, *'Titanic' and other ships* (London: I. Nicholson and Watson, 1935), p. 257.
- ⁴⁹ PQ by Sir E. Carson, reply by Asquith. *Hansard*, 5th ser. vol. 37 para. 2060.
- ⁵⁰ Davie, *Titanic*, pp. 183-184.
- ⁵¹ Phil Scraton, *Hillsborough: The Truth* (Mainstream: Edinburgh, 1999).
- ⁵² *Hansard*, 5th ser., 38: 1782, speech of Mr G. Terrell.
- ⁵³ See Mersey Report, pp. 49-60.
- ⁵⁴ *Hansard*, 5 ser., 38: 1765.
- ⁵⁵ *Hansard* 5 ser., 42: 32-103, quoted at columns 32, 61
- ⁵⁶ Iain McLean, 'On moles and the habits of birds: the unpolitics of Aberfan', *20th Century British History*, 8, 1997, 285-309.
- ⁵⁷ UK inquiry, Minutes of evidence, Day 1, pp 7—8.
- ⁵⁸ UK inquiry, Minutes of evidence, Day 3, pp. 30—1; Day 4, p. 58—9.
- ⁵⁹ UK inquiry, Minutes of evidence, Day 3, p. 46
- ⁶⁰ Neil Hamilton, quoted in Charles Woolfson & Matthias Beck, Matthias, 'Deregulation: The Contemporary Politics of Health and Safety', in Aileen McColgan (ed.), *The Future of Labour Law* (London: Cassell, 1996), p. 195.
- ⁶¹ Mark Bovens and Paul 'tHart, *Understanding policy fiascoes* (London: Transaction Publishers, 1996); Robert Gregory, 'Political responsibility for bureaucratic incompetence: tragedy at Cave Creek', *Public Administration* 76, 1998, pp. 519—38.
- ⁶² See H. Parris, *Government and the Railways in 19th-Century Britain* (London: Routledge, 1995); I. McLean and C. Foster, 'The political economy of regulation: interests, ideology, voters and the UK Regulation of Railways Act 1844', *Public Administration* 70 1992 pp. 313-331; C. Foster, *Privatization, Public Ownership and the Regulation of Natural Monopoly* (Oxford: Blackwell, 1992), pp. 15—69.
- ⁶³ McLean, 'Moles'
- ⁶⁴ McLean and Foster, 'Political Economy of Regulation'.
- ⁶⁵ C. Woolfson, J. Foster, and M. Beck, *Paying for the Piper: capital and labour in Britain's offshore oil industry* (London: Mansell, 1996).
- ⁶⁶ UK inquiry, Minutes of evidence, Day 1, p. 1.
- ⁶⁷ The classic text on this is Barry A. Turner, *Man-made Disasters* (London: Wykeham, 1978).