Hospitals as Cultures of Entrapment: A Re-Analysis of the Bristol Royal Infirmary

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Organizational culture is often used to explain extraordinary organizational performance. In fact, the term “safety culture” has recently emerged in the healthcare literature to describe the set of assumptions and practices necessary for healthcare organizations to provide optimal care. Culture enables sustained collective action by providing people with a similarity of approach, outlook, and priorities. Yet these same shared values, norms, and assumptions can also be a source of danger if they blind the collective to vital issues or factors important to performance that lie outside the bounds of organizational perception. Cultural blind spots can lead an organization down the wrong path, sometimes with dire performance consequences. This was the case at the Bristol Royal Infirmary (BRI).

The example of BRI represents a sustained period of blindness associated with organizational culture. Culture can entrap hospitals into actions from which they cannot disengage and which subsequently lead to repeated cycles of poor performance. The working definition of culture used in the BRI inquiry was “those attitudes, assumptions, and values which condition the way in which individuals and the organization work.” While Schein provides a more detailed definition, a more compact definition is used here to treat culture as “what we expect around here.” Cultural entrapment means the process by which people get locked into lines of action, subsequently justify those lines of action, and search for confirmation that they are doing what they should be doing. When people are caught up in this sequence, they overlook important cues that things are not as they think they are.

A preliminary set of ideas about Bristol were presented at a conference funded by the Agency for Healthcare Research and Quality held at the University of Michigan Business School November 16-18, 2001, titled “Creating an Organizational Infrastructure for Patient Safety.” We are indebted to Kyle Weick for his comments on a preliminary version of this article.
The Bristol Royal Infirmary pediatric cardiac surgery program had significantly higher mortality rates than other centers in England and failed to follow the overall downward trend in mortality rates seen in the other cardiac surgery programs. The case shows how small actions can enact a social structure that keeps the organization entrapped in cycles of behavior that preclude improvement. The question is why did Bristol Royal Infirmary continue to perform pediatric cardiac surgeries for almost fourteen years (1981-1995) in the face of poor performance? This persistence was the result of a cultural mindset about risk, danger, and safety that was anchored by a process of behavioral commitment that shaped interpretation, action, and communication.

Description of Events at Bristol Royal Infirmary Pediatric Cardiac Surgery

The Bristol Royal Infirmary (BRI) and the Bristol Royal Hospital for Sick Children, also known as Bristol Children’s Hospital (BCH), are teaching hospitals associated with Bristol University’s Medical School located in southwest England. In 1984, the BRI and BCH were designated by the National Health Service as one of nine Supra Regional Service (SRS) centers to provide pediatric cardiac surgical care for infants and neonates under 1 year old. (To put things into perspective, this involves surgery to correct anomalies on hearts no bigger than a peach pit.) BRI was designated to provide open-heart surgery, while the BCH was designated to provide closed-heart surgery.

The decision to centrally fund specialized services and establish the SRS center system was made by the National Health Service to control and concentrate resources and to assure that clinicians would encounter a sufficient number of rare cases to acquire necessary experience and expertise. As noted in the BRI Inquiry final report, the assumption was that “[a] unit should undertake a certain volume of cases to ensure good results in this very exacting field.” The idea was that the more practice, the better a center would become, and the more likely it would be to experience over time a complete range of rare conditions and complications.

Very few open-heart surgeries on children under 1 had been performed at BRI when it was initially designated. In contrast to other units in the UK that had developed special expertise in pediatric cardiac surgery, Bristol did not stand out in this area. In fact, government officials admitted that the case for making Bristol an SRS was weak because it was unlikely to have sufficient volume to maintain the proficiency of its participants. Still a decision to designate it as an SRS was made primarily on geographic grounds—there were no other locations in southwest England nearly as capable as Bristol, and to have no program in southwest England at all would have led to quite long transfer distances. As
noted in the report, “the Advisory Group was concerned to see that part [south-west England] covered...if you are designating a service for the first time and you are endeavoring to cover the country, you may well have to identify a unit which at that moment in time is not performing as well as some of the other centers which may have been established for many years, the intention is to develop that service, nurture that service.”

The physical setting at Bristol is worth noting since it figures prominently in the inquiry report. BRI is located two-blocks away from the BCH. Open-heart surgery is done at Bristol Infirmary and closed heart is done at Children’s Hospital. Cardiologists are located at Children’s Hospital, there are none at the BRI, and surgeons are based at BRI. Most of the children are kept in wards at BRI after they are operated on with an open-heart procedure. At BRI, open-heart surgery is done on the fourth floor, while the ICU unit is on the sixth floor. The ICU unit can only be reached by a non-dedicated elevator, so it is necessary to have somebody moving out of surgery waiting for an elevator, with the possibility of getting on an elevator that has several other people on it. Once children are moved up to the sixth floor, they are taken care of for a short period of time until they are stabilized. Then they are taken back down in the elevator, transferred to an ambulance that moves them to the BCH where they are cared for on a ward. These transfers and handoffs all have the potential to magnify small problems that linger after surgery. The problems with the split site and split service were noted in the early 1980s by hospital officials and the regional health authority and the aim was to unify the care of children on one site and to recruit a surgeon who specialized in pediatric cardiac surgery.

Several other features need mentioning. First, the regional health authority and hospital board relied on the CEO, Dr. John Roylance, for direction. Dr. Roylance in turn relied on Dr. James Wisheart, one of the two pediatric surgeons who did the work. Wisheart was a man of many trades, holding other positions in BRI such as associate director of cardiac surgery and the chairman of the hospital’s medical committee. Wisheart is described in the report in rather negative terms; he arranges late to surgery, his patients typically are on bypass before he shows up (not highly recommended), and when he gets into complicated problems he is faulted for not being able to step back and see what is developing. Moreover, he’s intimidating and autocratic enough that the rest of the team is reluctant to tell him what they see unfolding in front of them. The other surgeon is Dr. Janardan Dhasmana, who is described as being more deferential. He is seen to have adequate skills with the exception of the neonatal switch procedure. He is also described as self-critical, disengaged from his surgical team, and unaware of their importance as a “whole team.”

Dr. Wisheart and Dr. Dhasmana operated both on children and adults. However, pediatric cardiac surgery was only a small part of the overall cardiac
surgery activity. Experts agreed that the minimum caseload necessary for a center to maintain sufficient expertise was approximately 80-100 open-heart operations annually for two surgeons (40-50 per surgeon).14 As noted, the Bristol open-heart pediatric caseload for children under 1 year of age was low, averaging about 46 between the two surgeons per year.

When the pediatric cardiac surgical program began, its performance was roughly commensurate with the other programs. However, over the next seven years, while all other centers improved their performance, Bristol did not. Between 1988 and 1994, the mortality rate at Bristol for open-heart surgery in children under one was roughly double the rate of any other center in England in five of the seven years. The mortality rate (defined as deaths within 30 days of surgery) between 1984 and 1989 for open-heart surgery under 1 at Bristol was 32.2% and the average rate for the other centers for the same period was 21.2%.15 For the year 1989-1990, the mortality rate for Bristol was 37.5% and the comparable figure for other UK centers was 18.8%.16 For the period 1991 to 1995, data analyses showed that Bristol had between 30 and 35 excess deaths over what would have been expected if the unit had been “typical” based on the performance of the other eleven centers around the UK. The mortality rate for closed-heart procedures in children under 1 year at BCH did not differ significantly from those of the other centers around the UK.17 Although some clinicians explained the differences in mortality rates on the ground that Bristol was seeing a more complex mix of cases, clear evidence indicated “divergent performance in Bristol.”18 Bristol simply had failed “to progress.”19

Clues that things were not going as well as they seemed were abundant. In fact, concerns about pediatric performance began to surface as early as October 1986 when a professor at the University of Wales wrote to the Regional Health Authority to report: “It is no secret that their [BRI pediatric cardiac] surgical service is regarded as being at the bottom of the UK league for quality.”20 Government officials investigated the issue, but in the absence of supporting evidence, they concluded that the problem was related to the volume of cases, not the quality of care.21 As events unfolded there were at least 100 formal concerns raised about the quality of care being delivered, including those raised by Dr. Stephen Bolsin, a consultant anesthetist who joined BRI in 1988.22 Bolsin immediately noted differences between his previous experience at Brompton hospital and his experience at BRI. In contrast to Brompton, operations at BRI were longer, which meant that the babies were being kept on the by-pass machines much longer with consequent adverse outcomes.

In addition to Bolsin’s explicit and repeated complaints to colleagues, he complained to the hospital’s CEO John Roylance, who dismissed him by saying the issue was a clinical matter, one that was the domain of the pediatric cardiac surgeons. While Bolsin wasn’t shy about expressing his concerns to the CEO and colleagues within his specialty, he never directly confronted either of the surgeons with his concerns. Concerns surfaced in other places as well. An article written by the Pediatric Pathologist at Bristol reporting on postmortem examinations of seventy-six Bristol children who had under gone surgery for congenital
heart disease was published in the Journal of Clinical Pathology in 1989. Among the findings reported in that article are 29 cases of cardiac anomalies and surgical flaws that contributed to death. In January 1991, the Royal College of Physicians refused to accredit the BRHSC as an institution to train pediatric cardiology because of the split site and split services. A series of six exposé articles criticizing pediatric care at BRI, written by Dr. Phillip Hammond, were published in Private Eye (Bolsin was the source of the information for these articles). Events reached a climax in early 1995 after the death during surgery of a child, Joshua Loveday, whose operation had been resisted by everyone except the two surgeons. An external review by two people selected by Dr. Wisheart described “confusion” at Bristol and pediatric cardiac surgeries were essentially halted. Parents called for an inquiry in 1996. The inquiry itself started June 18, 1998 and ended with the publication of the report in July 2001.

What Happened?

There is no disagreement that the pediatric cardiac service provided at Bristol was less than adequate and continued as such for many years in the face of growing evidence of the poor quality of care. Although there are many plausible interpretations of what went wrong, one of the most striking findings of the Bristol inquiry is the conclusion by investigators that “while the pediatric cardiac service was less than adequate, it would have taken a different mindset from the one that prevailed on the part of the clinicians at the center of the service, and senior management, to come to this view. It would have required abandoning the principles which then prevailed: of optimism, of ‘learning curves,’ and of gradual improvements over time. It would have required them to adopt a more cautious approach rather than ‘muddling through.’ That this did not occur to them is one of the tragedies of Bristol.”

How did the mindset originate and why was it impervious to change? A single organizational process of behavioral commitment explains the origins of the BRI mindset and its persistence. While this mindset may look like “muddling through” from the outside, it has a different standing inside. The mindset at BRI was sufficiently workable and reasonable that it explained away both poor performance and the need to learn.

The basic ideas of behavioral commitment are summarized by Salancik and Pfeffer. “Commitment binds an individual to his or her behavior. The behavior becomes an undeniable and unchangeable aspect of the person’s world, and when he makes sense of the environment, behavior is the point on which constructions or interpretations are based. This process can be described as a rationalizing process, in which behavior is rationalized by referring to features of the environment which support it. Such sensemaking also occurs in a social context in which norms and expectations affect the rationalizations developed for
behavior, and this can be described as a process of legitimating behavior. People
develop acceptable justifications for their behavior as a way of making such
behavior meaningful and explainable."

That description is noteworthy for its connections between micro and
macro levels of analysis. At the macro level of hospitals and their environments,
the description links micro rationalizing processes such as justification to the
larger setting when it refers to: features of the environment that offer support
to the justification; the social context whose norms and expectations supply the
content of justification; legitimacy of actions and justification in the eyes of key
stakeholders; and justifications that are explainable and meaningful to people
outside the circle of action at the sharp end of the error chain.

At the micro level, the description links justification to specific details in
day-to-day medical work. When people take important actions that are visible
and hard to undo, it is hard for them to deny that the actions actually occurred.
If those clear actions are also seen as volitional, then those actions are also
harder to disown and the actor is held responsible for them. Public, irrevocable,
chosen actions put reputations on the line and compel some kind of explanation
and justification. The content of those justifications is not chosen casually
because so much is at stake. Only a limited number of justifications are socially
acceptable, and people have to live with the justifications they adopt. Thus,
whatever justifications people voice tend to have considerable tenacity, they
tend to influence subsequent perceptions and action, and they focus disproportio-
nately on information that confirms their validity rather than disconfirms it.
Behavioral commitment, therefore, has three components: an elapsed action,
socially acceptable justification for that action, and potential for subsequent
activities to validate or threaten the justification.

It is important to understand that the idea of justification as used here is
not synonymous with mere individual self-justification or defensiveness. Justifi-
cation is “rationalizing done within socially acceptable bounds." Rationaliza-
tion will not work unless it is culturally appropriate.

These ideas help us make sense of what happened at BRI. Bristol is
described as a collection of fragmented, loosely coupled, self-contained subcul-
tures (the inquiry board calls them “tribes”), managed by a CEO whose idea of
leadership and oversight was to say, “You fix it." The BRI culture is one in which
people share the practice “of explaining or justifying...mediocre or poor results
on the basis of case severity rather than directing attention to producing better
results." The prevailing explanation for bad results at BRI is not “we are doing
something wrong and need to improve,” but rather that these are “bad
patients...and we are doing our best.”

If this pattern at BRI is translated into the language of behavioral com-
mitment, then there is high autonomy and choice within each sub-culture of
professionals. There is high irrevocability since surgical interventions on tiny
patients are hard to reverse. In addition, there is high visibility for the actions
and outcomes among people within the same specialty, surgical teams and ICU
personnel, and among referring cardiologists, the families of patients, and
regional and National Health Service monitors. BRI, as is true of many hospitals, enacted a context of choice, irrevocability, publicity, and rationales within which adversity was an outcome that was easier to justify than to remedy. The initial justifications that focused on unusual case complexity had a surprising tenacity that is explained by the fact that they served to reduce uncertainty, they were supported when “tested” against records maintained by the affected personnel, and they were plausible in the sense that a case can be complex either because of the patient’s presenting condition or because of the physician’s inadequate treatment of that condition. Moreover, right when the justification seemed most endangered, there was an anomalous year in 1990 where mortality rates at BRI came back into line with those of the other centers.33 Rather than question why there was this change, people treated it as evidence that the justifications were correct (i.e., we’re learning and gradually improving).

The BRI board of inquiry summarized the essentials of what we call a culture of entrapment, this way: “The surgeons were working in a relatively new and developing field of highly complex surgery. They were dealing with small numbers of disparate congenital cardiac anomalies. Perhaps unsurprisingly, they tended to turn to their own logs of operations as the most detailed, relevant and reliable sources of data. In these logs they saw a pattern of complex cases. In this hard-pressed service, which was attempting to offer the full range of specialist care to these children, as well as meeting all the other needs of a cardiac surgical unit, the poor results achieved were believed then, and are still believed, by Mr. Wisheart to be the result of this pattern of complex cases, the result of caring for an unusually high proportion of unusually difficult cases.”34 Tenacious justifications make it harder to learn, harder to discontinue the justified action, and easier to spot information that confirms their validity. Carried to the extreme, this is one mechanism by which people developed “professional hubris.”35

This basic social process for constructing reality is common to organizations of all kinds, both those experiencing adversity and those experiencing success.36 Even though this social process is fundamental, it gets ignored because people tend to blame adversity on operators at the sharp end of the accident chain and fail to look at earlier moments when commitments are hardening. The analytic error is compounded when people are then removed from their organizational contexts (which favor some justifications and discourage others) and are then judged one at a time, in isolation, as if they alone intended to err.

Static renderings of organizational structure can mask ongoing interpretations, expectations, and learning that enable action to continue. Medical work turns either toward adversity or away from it because of the content of culture. However, content alone is not sufficient to produce adversity or to protect against it. Content needs to matter. When it is selectively mobilized to justify actions that might otherwise raise doubts about legitimacy, then content matters...
a lot. Content that matters can either open current practices to closer inspection and improvement, or it can seal them off—as was the case at BRI.

**Discussion**

“Medicine used to be simple and ineffective and relatively safe, but now it is complex, effective, and potentially dangerous.” Surges at BRI did not expect that their learning would be so gradual, or that other centers would outperform them, or that their own management would inadvertently undermine possibilities for improvement. When the unexpected occurs, sensemaking intensifies. As Diane Vaughan made clear in her analysis of the Challenger disaster: “When an unexpected event occurs, we need to explain it not only to others, but to ourselves. So we imbue it with meaning in order to make sense of it. We correct history, reconstructing the past so that it will be consistent with the present, reaffirming our sense of self and place in the world. We reconstruct history every day, not to fool others but to fool ourselves, because it is integral to the process of going on....People attempt to rescue order from disorder.”

BRI reconstructed a history of excess deaths and transformed it into a history of excess complexity. That reconstruction rescued order from disorder and imbued the past with meaning, all of which is perfectly understandable. What is harder to accept is the persistence of a rationale that precludes learning, reduces openness to information, and minimizes cross-specialty communication. The reconstructed rationale persists because layers of bureaucrats above the surgical unit, people who had some say in the original choice to designate BRI as a center of excellence, find their own judgments in jeopardy. The unintended consequence is that the whole chain of decision makers comes to support an explanation that makes it difficult for an underperforming unit to improve or to stop altogether.

To analyze BRI as a setting that entraps people in behavioral commitments does provide a compact synopsis of a sprawling, complex lapse in patient safety. However, there is always the danger that such an analysis seems like little more than an exercise in re-labeling. That is not the case here. There are some unusual implications that follow from the analysis, three in particular.

One unexpected twist is that those who are in a better position to learn from adversity are those who have low choice to become involved in adverse events. If high choice sets justification in motion, then low choice reduces the pressure to justify and reduces the necessity to engage in a biased search for the sources of adversity. Choice is higher at the top of hierarchies than at the bottom (e.g., surgeons are higher than anesthetists who are higher than nurses). People at the bottom of hierarchies also tend to be closer to the patient’s bedside, for longer periods, with richer data. They see adversity as it unfolds; and their reduced sense of volition reduces pressure on them to justify and construct acceptable reasons for errant actions.

However, there is a catch. Their actions are visible to everyone above them in the hierarchy and they are also at the sharp end of the chain of events
leading to adversity where the last irrevocable act occurs. This increases pressure on them to justify adverse outcomes. People at the bottom are torn between justification and candor. Their public irrevocable acts tempt them to justify, but their forced compliance with directives from above tempts them toward candor. The tensions created by these opposing temptations may mean that frontline medical workers are people at a tipping point. That possibility is important because it means that they may welcome surprisingly small interventions of support, security, and psychological safety that could tip the balance toward candor and learning and away from concealment and justification. The point here is that fear of punishment may not be the only dynamic that leads people to cover up error. Errors may look like they are being covered up when in fact they are being explained away in order to justify public, irrevocable, volitional actions that have turned into mistakes.

If attempts to improve patient safety focus on justification rather than on fear of punishment, then the targets for change are quite different. Interventions would tend to focus on perceived choice with the intent to show that earlier choices were less voluntary than first thought (e.g., you really had no choice but to go in), and/or focus on perceived irrevocability with the intent to show that treatment can be started over (e.g., let’s stop all medications and see where we are), and/or focus on perceived visibility with the intent to demonstrate that observers forgot what they saw, were unimportant to begin with, or understood how the system conspired to make things worse (e.g., they have rotated onto a different service and are seeing a different set of problems). The central and simple idea is that people with less of a stake in what they can afford to see and what they must ignore, will see more, spot the development of adversity at earlier stages, and contain adversity more effectively.

A second unexpected twist is that the much-discussed “autonomy” of professionals such as surgeons and hospital CEOs takes on a different meaning. Hospitals are contexts in which autonomy works against learning. When physicians contract with hospitals, call their own shots, and, as in the case of BRI, “report to” a CEO who says “you work it out, the quality of clinical care is your exclusive preserve,” then they experience relatively high levels of choice. If you add in the fact that when physicians are concerned about accountability and liability, these are proxies for visibility and irrevocability, then it is clear that hospitals are sites where professional action is exceedingly binding and where justifications are consequential. The net result is that change is next to impossible, even when no one is satisfied with current performance levels. Through repeated cycles of justification, people enact a sensible world that matches their beliefs, a world that is not clearly in need of change.

Finally, the idea of a “safety culture” is applicable in medical settings, but
not for the reasons people usually think. Discussions of culture typically focus on content and refer to shared beliefs, shared norms, and shared assumptions. The BRI board of inquiry variously referred to BRI as a provider-oriented culture, a culture of blame, a culture of inner circle and not on your performance, a culture of fear, an oral culture, a culture of justification, a culture of paternalism (professionals know best so don’t ask questions), and a culture of uncertainty. As investigators combed through the BRI data with the benefit of hindsight, they sought some kind of “invisible hand” that preserved the same interpretation of the same inadequate performance for several years. People at BRI persistently believed that things were anomalous rather than unacceptably poor. It was the combination of choice, irrevocability, and publicity that preceded this interpretation and not the content of the interpretation per se that precluded learning. Accelerated learning, in this view, is more likely when the committing context itself is weakened and not when the content of justifications dwells more on maxims of safety.

If there is a maxim implied in this analysis, it reads “challenge easy explanations.” An “easy” explanation is one that has shallow plausibility, meaning that it can explain away any outcome, is not readily refuted, and the best that can be done to disarm it is to doubt it. Easy explanations for the poor outcomes at BRI included: “our poor outcomes will improve over time with experience,” “outcomes will improve once we get a hoped-for new surgeon,” and “our poor outcomes are an artifact of small numbers that look worse when converted into percentages, and they are inevitable because we are treating sicker children.” As the board of inquiry said, “All of these arguments had sufficient plausibility at the time that they could be believed, and they could not be readily refuted, though they might be doubted.”

Justification turns a conspicuous action into a meaningful action. The resulting meaning can promote or impede improvement. Culture plays at least two roles in this transformation. First, culture supplies the meaning. Second, culture supplies the conspicuousness that influences the intensity with which the meaning is defended.

The lesson for hospitals is also twofold. First, be certain that the socially acceptable reasons that are available as content for justifications center on a learning orientation that values communication, openness, mutual aid, and mindful attention to patient care. As Marc de Laval put it, “physicians must become more open and comfortable with their fallibility and the patients must accept their own vulnerability.” Second, hospitals should try to weaken the committing context that surrounds adverse events so that people are not forced to justify inadequate performance. This is the tougher assignment of the two. The BRI inquiry board said that the better professional mindset at BRI would have been “to abandon the principles which then prevailed of optimism, of learning curves, and of gradual improvement over time, and adopting what may be called the precautionary principle.” However, that is as far as the board went. One way to give substance to their precautionary principle is to translate...
it into the image of tempered commitment. To temper a committing context is to create moderate levels of choice, publicity, and revocability. One means to do this is to make the interdependencies that are involved in medical work more explicit. The unwillingness and inability to see and improve interdependence at BRI was the feature most often criticized. This feature is the one that makes the biggest difference in performance improvement.

When people understand interdependence, behavioral commitment can be moderated. Thus, choice is reframed as a collective responsibility such that the buck stops everywhere. Publicity is reframed as a collective commitment to provide constructive feedback to one another in order to improve performance. Irrevocability is reframed as a collective responsibility to identify escape routes, contingency plans, and to mentally simulate potential interventions in order to spot potential traps. When choice, publicity, and irrevocability are treated as collective responsibilities necessitated by task interdependence, this spreads responsibility but it does not diffuse it.

The dangerous person in a scenario of behavioral commitment is an exposed individual, in search of perfection, who is reluctant to admit fallibility, but who also feels momentarily vulnerable in the face of adverse behavioral commitments. Vulnerability continues until he or she finds a plausible justification that explains the adversity away. What began as merely a plausible justification is likely to harden into dogma because it performs such an important function. Dogma precludes learning, and it precludes improvement. This is what happened at BRI and it need not happen again.

Notes
3. Ibid.
4. Learning from Bristol (Crown Copyright 2002), p. 266.
7. Learning from Bristol [see note 8], p. 4.
8. All details concerning the Bristol Royal Infirmary are taken from the Bristol Royal Infirmary Inquiry Final Report. The Report of the Public Inquiry into Children’s Heart Surgery at the Bristol Royal Infirmary 1984-1995, Learning from Bristol, Presented to Parliament by the Secretary of State for Health by Command of Her Majesty, July 2001, Crown Copyright 2001. The inquiry was conducted between October 1998 through July 2001. The magnitude of the inquiry is daunting. The final printed version of the report is 530 pages and includes two CDs of raw data. The investigators received written evidence from five hundred and seventy-seven witnesses (two hundred and thirty-eight of those witnesses were parents). They also received and reviewed over nine hundred thousand pages of documents, eighteen...
hundred medical records, and took oral evidence for ninety-six days. They commissioned a
hundred and eighty papers that were presented at seven different seminars. There are no
restrictions on quoting or using the report. See www.bristol-inquiry.org.uk.

10. Ibid., p. 25.
11. Ibid., p. 105.
12. Ibid., p. 105.
13. Ibid., p. 175.
15. Ibid., p. 139.
17. Ibid., pp. 4-5.
18. Ibid., p. 4.
19. Ibid., p. 4.
20. Ibid., p. 134.
22. Ibid., pp. 134-151.
23. Ibid., p. 136.
25. Ibid., p. 141.
26. Ibid., p. 4.
27. G.R. Salancik and J. Pfeffer, “A Social Information Processing Approach to Job Attitude and
28. Ibid., p. 231.
29. Ibid., p. 235, footnote 3.
30. Learning from Bristol, op. cit., p. 266.
32. Ibid., p. 161.
33. Ibid., p. 4.
34. Ibid., pp. 239-240.
35. Ibid., p. 164.
36. For examples, see M. L. Tushman and C.A. O’Reilly III, Winning through Innovation: A Practical
   Guide to Leading Organizational Change and Renewal (Boston, MA: Harvard Business School
37. Sir Cyril Chantler, former Dean, Guy’s, King’s and St. Thomas’s Medical and Dental School,
   cited in Learning from Bristol, op. cit., p. 355.
38. D. Vaughan, The Challenger Launch Decision: Risky Technology, Culture and Deviance at NASA
40. M. Paget, The Unity of Mistakes: A Phenomenological Interpretation of Medical Work (Philadelphia,
41. Learning from Bristol, op. cit., p. 74.
42. Ibid., p. 257.
43. Ibid., p. 16.
44. Ibid., p. 302.
45. Ibid., pp. 68, 201.
46. Ibid., p. 201.
49. Ibid., p. 268.
50. Ibid., p. 273.
51. Ibid., p. 163.
52. Ibid., p. 148.
53. Ibid., p. 247.
54. Ibid., p. 247.
55. Ibid., p. 272.
56. Ibid., p. 248.
57. Ibid., p. 4.