Public Policy and Administration
http://ppa.sagepub.com/

A Chaos that Worked : Organizing Bletchley Park

Christopher Grey and Andrew Sturdy

Public Policy and Administration 2010 25: 47
DOI: 10.1177/0952076709347075

The online version of this article can be found at:
http://ppa.sagepub.com/content/25/1/47

Published by:
SAGE
http://www.sagepublications.com

On behalf of:
ppa
Public Administration Committee

0952-0767
201001 25(1) 47–66

A Chaos that Worked

Organizing Bletchley Park

Christopher Grey and Andrew Sturdy
University of Warwick, UK

Abstract Drawing on a major historical study of the organization of Bletchley Park, the site of British and Allied codebreaking during the Second World War, this article shows that it was characterized by 'chaos' in terms of a lack of clear formal structures. It is argued that the success of Bletchley Park can be explained in terms of various factors including shared social capital of some employees, organizational hybridity, centralization, knowledge-sharing and organizational porosity. These factors may be understood to be the reasons why Bletchley Park was successful *despite* its organizational chaos, but the paper seeks to advance the stronger claim that it was successful *because of* its organizational chaos.

Keywords administration in the Second World War, Bletchley Park, contingency theory, organizational chaos, organizational hybridity, signals intelligence

Introduction

It is now over 30 years since the work of Bletchley Park (BP) during the Second World War became public knowledge (Winterbotham, 1974) and since then material relating to it has been gradually, although still not entirely, declassified. BP was the place where British signals intelligence (Sigint) efforts were concentrated and is most famously associated with the breaking of the German Enigma cipher. It has now entered popular mythology and has been the subject of a novel (Harris, 1995), giving rise to the film *Enigma*. BP has been satirized in a BBC radio comedy show, *Hut 33*, and elsewhere:

> At Bitchily and Tetchily Park, highly strung men and women in thick spectacles sat stooped over crossword puzzles and chessboards in chilly, poorly lit rooms throughout the night attempting to catch the famous Enigma cold. (Brown, 2005: 46)

DOI: 10.1177/0952076709347075
Christopher Grey, Warwick Business School, University of Warwick, Coventry CV4 7AL, UK.
[email: chris.grey@wbs.ac.uk]

At the same time, it has attracted a host of academic analyses and detailed journalistic accounts concerned with the significance of BP for military history (e.g. Hinsley, 1993a; Hinsley et al., 1979; Smith, 1998) and diplomatic and strategic history more widely (Ferris, 2005); and for the development of cryptographic and cryptanalytic techniques (Kahn, 1996) and of computing (e.g. Copeland, 2001; Goldstine, 1993). In addition, there is a quite massive literature of reminiscences, many of which contain significant information about BP's work (e.g. Calvocoressi, 2001; Hinsley and Stripp, 1993; Welchman, 1981). Although some of this literature touches in more or less detail upon it, what has been much less widely explored is how BP was organized (cf. Davies, 2001; Herman, 1996; Ratcliff, 2006). It is this which is the focus of the present article. In it, we present an explication of the organization of BP and will advance an explanation of why it was successful. Our thesis, in brief, is that BP was characterized by a chaotic and incoherent set of formal structures, but that there were a series of organizational features that meant that BP managed to operate effectively. The 'weak' version of this thesis is that BP was successful *despite* the chaos of its formal structures, but we also want to present a 'strong' version of that thesis to the effect that BP was successful, at least in part, *because of* those chaotic structures.

We suggest that this offers an unusual, and we hope unusually interesting, case of how successful public administration can operate. Its significance lies partly in its implications for what has become the dominant way in which policy makers in the UK have approached bureaucracy in public administration. The guiding theme, since at least the advent of New Public Management, has been that bureaucracy is a 'problem' to be reformed. Such reform has for some years now, been explicitly configured in terms of 'post-bureaucracy' (e.g. Kernaghan, 2000; Morris and Farrell, 2007) and this has been a feature of New Labour policy (Newman, 2001) while also being placed at the centre of emergent Conservative thinking on the delivery of public services (Cameron, 2009). These developments draw upon the broad swathe of organizational and administrative theory to the effect that post-bureaucracies necessarily offer operational superiorities (Heckscher, 1994), a view which, while subject to challenge (Du Gay, 2000), has become so dominant that it can now be considered mainstream.

Within this context, the BP case is instructive not least because it serves to remind us of the limitations of polarized thinking about the merits and demerits of bureaucracy and post-bureaucracy by recalling what used itself to be mainstream in organizational and administrative theory, namely the notion of contingency. As we hope to show, one aspect of the 'chaos' at BP was the co-existence of what in traditional contingency theory were called 'mechanistic' and 'organic' organizational designs (Burns and Stalker, 1961), which roughly correlate to 'bureaucracy' and 'post-bureaucracy'. Moreover, that it is possible to do this in relation to an *intelligence* organization is significant since such organizations have many of the characteristics of knowledge-intensiveness (Grey and Sturdy, 2009), which are normally thought of as associating with post-bureaucracy. Thus, the BP case has

the potential to help re-evaluate some of the more breathless claims of those who would see a single direction of travel in administrative effectiveness.

Germane to these wider issues is the way that our account of BP will serve as a corrective to its perhaps dominant received image. This tends to envisage BP in terms of the genius of individuals of whom perhaps the most famous is Alan Turing (Hodges, 1992). More recently it has also become widely recognized that the 'mundane' work of thousands of people in technical, clerical and other capacities was vital to BP's success. Their experiences have begun to be recorded through accounts such as those in Hill (2004) and Page (2002, 2003). The effort required to bring together, in conditions of complete secrecy, a complex organization that increased in size from some 200 employees in 1939 to some 10,000 in 1944 was substantial. To do so in ways that combined both the esoteric and the mundane was an even more noteworthy achievement. It is with this that we are concerned.

Sources and Methods

This article is drawn from a major, ongoing research project on the organization of BP (see also Grey and Sturdy, 2008, 2009), a project that utilizes a number of sources and methods. The primary data are drawn from a study of archive material held at the National Archives (NA), and reproduced in the Bletchley Park Trust Archive (BPTA) where we consulted it. The main relevant document sequences are HW3 and HW14.[1] The BPTA also holds some 200 interviews with former BP staff, conducted by different interviewers for different purposes over several years, and we have consulted these for passing references to organizational issues. We also draw upon the archives of Churchill College, Cambridge, which houses the papers of Alistair Denniston, the first head of BP (the DENN sequence). In addition, we have consulted the voluminous secondary literature on BP and related matters.

Archive data and secondary literature have been supplemented by interviews or correspondence with 15 surviving members of BP staff, mainly contacted through the Bletchley Park Trust and selected from a wider group of volunteers according to the knowledge they might be able to shed on organizational issues. The interviews, which were tape-recorded, took place in 2004 and 2005, normally in the interviewees' own homes and with their prior written consent. We also talked to a wider number of BP veterans in a more informal way at their 2005 reunion and have had a range of other informal contacts with them. These included a tour of the sections of the main house at BP, not normally open to the public, where the Directorate had their offices, conducted by one of our interviewees who had been an office junior there at the time. We were aware of methodological issues associated with the use of such retrospective testimony (for a discussion, see Summerfield and Peniston-Bird, 2006) and have used it only with great care as an adjunct to the archive material.

Structure of Paper

We will begin the article with a brief and highly simplified explanation of the basic functioning of BP – what it was for and how it operated – for those who may be unfamiliar with it, since this is necessary to make sense of the detailed material and analysis which follows.

We then present the two main sections of the article. In the first, we seek to establish the chaotic nature of BP in organizational terms, stressing its lack of clear lines of command and control and its departure from standard precepts of administrative rationality. In the second main section we seek to explain why BP was nonetheless able to operate successfully. We identify three main factors: shared social capital; organizational hybridity; centralization, knowledge-sharing and organizational porosity. These sections are followed by a discussion in which we seek to establish our 'strong thesis' that these success factors were present precisely because of the absence of a conventionally efficient and well-specified organizational structure.

A Simplified Account of Bletchley Park

Bletchley Park lay at the heart of the British Sigint effort in the Second World War. The targets of this effort were the ciphers and codes of the Axis powers and although in this article we refer to those of Germany it should be noted that Italian, Japanese and other ciphers were also dealt with at BP. The easiest way to think of BP's work is in terms of the sequence of processes entailed. In outline, these were

- Interception of signals at listening (Y-) stations, run by a variety of agencies and services, located around the country and the world;
- Transport of intercepts (often 'corrupt' i.e. with missing or incorrect segments) to BP;
- Decryption of intercepts (running to thousands a day) in many different ciphers (e.g. 'Enigma' and 'Fish'), which themselves had numerous variants or 'keys', each one of which, in the case of Enigma, changed daily. Decryption was achieved though highly complex manual, mechanical (e.g. 'bombes') and electromechanical means (e.g. 'Colossus' for 'Fish');
- Emendation (i.e. 'de-corruption') and translation of decrypts (including highly technical terms and abbreviations) into English;
- Intelligence assessment of decrypted material (indexing, cross-referencing being crucial to this process);
- Secure distribution of intelligence product to customers (e.g. ministries, field commanders);
- Use in field or strategy (or not – since sometimes to have used the intelligence would have revealed its existence and thus led to the cipher being changed or abandoned).

For these processes to occur, a vast range of organizational activity was necessary. For example, as successful decryption grew in volume, so the staff of BP increased, as indicated earlier. The original mansion house at BP was quickly outgrown and there was a massive building programme, initially of wooden huts (giving rise to appellations such as 'Hut 3' used in this article) and subsequently concrete blocks (for a full account, see Evans, 2003). The new staff had to be recruited and vetted. At the same time, these staff had to be billeted (BP staff were dispersed over a wider area in private houses as well as dormitories of various sorts), transported to BP over three daily shifts, and fed.

Finally, complete secrecy had to be maintained about the work of BP. This, in itself, is an interesting organizational story, albeit one which we do not have the space to tell here but perhaps the most important organizational consequence that needs to be realized is that the vast majority of those at BP had no idea what it was they were actually doing. For example, most of those working on Enigma did not know that it had been broken, and many did not even know that they were engaged in codebreaking at all (and did not know until, if they were still alive, it became public knowledge in the 1970s). Such knowledge was strictly on a 'need to know basis' and although it is impossible to give exact figures it seems likely that less than 1000 people at BP knew that Enigma had been broken.

From this very brief account it is hopefully possible to see that the organization of BP was necessarily a thing of great complexity and that it offered some highly unusual challenges. It is to these that we now turn.

The 'Chaotic' Organization of Bletchley Park

To speak of the organization of BP is to some extent a misnomer in that it was more precisely a place in which a large number of organizations intersected. The site had been acquired for the Government Communication and Cypher School (GC&CS) before the war and was at that stage a station of the Secret Intelligence Service (SIS) of which GC&CS was a part, following the 1919 reorganization of British Sigint. The main effect of this was to a large extent to bring together the Sigint efforts of the different military services, albeit that, as mentioned above, Y-station resources remained fragmented between services and overseen by the Y-committee and a series of sub-committees (for the detail of these complex arrangements, see Hinsley et al., 1979, pp. 267–74). Financially, it was, in the words of its first head,[2] Commander Alistair Denniston, 'the adopted child of the Foreign Office with no family rights' (DENN 1/4: 2). However, GC&CS acted as a node bringing together a wide array of organizations, most notably those of the three armed forces (including both male and female branches), as well as a variety of civilian organizations from the Foreign Office to the General Post Office, and working with a wide range of external contractors such as the British Tabulating Company.

The complexities and difficulties of this arrangement were well recognized at the time. On 28 March 1943, Nigel de Grey, then the second in command at BP,

wrote an ironically worded memorandum on its organization. It is worth quoting at length, for, as a covering note from BP's second head, Commander Edward Travis, recognized, it contained 'a great many truths':

> I suppose that if you were to put forward a scheme of organizations for any service which laid down as its basis that it would take a lot of men and women from civil life and dress some of them in one kind of clothes and some of them in another, and told all those dressed in black that they came under one set of rules and all those dressed in white under another and so on and then told them that they had a double allegiance, firstly to the ruler of their black or white or motley party and secondly to another man who would partly rule over all of them, but only partly, any ordinary tribunal would order you to take a rest cure in an asylum . . . Yet that is in fact the precise organization of BP. Now it happens that BP has been successful – so successful that it has supplied information on every conceivable subject from the movement of a single mine sweeper to the strategy of a campaign and the Christian name of a wireless operator to the introduction of a secret weapon. (NA/HW 14/71)

This contemporary evaluation of the organization is matched by that of more recent analysts. In terms that resonate with those of De Grey, Philip Davies writes that

> GC&CS was very much an assortment of semi-independent sections with divided loyalties and subject to dual lines of control between GC&CS and their department of origin . . . but . . . GC&CS found itself in possession of a rich vein of raw intelligence . . . (Davies, 2001, pp. 395–6)

At the heart of this double allegiance lies the relationship between civil and military organizations (with the added complexity that many of the military personnel where themselves recently mobilized civilians). As Nigel de Grey, this time in his post-war 1949 review, expressed it,

> The history of relations of GC&CS to the Services consists almost entirely of the quarrels that resulted from this bad organization, having parallelism in no way as between the 3 Services or logic within GC&CS, and the efforts to straighten them out. (NA/HW 14/145, p. 22)

And, once again, more recent academic analysis has made the same point:

> Relations between the military and civilian sides was strangest of all at Bletchley Park, where the chain of command was so loose that it bordered on anarchy. (Budiansky, 2000, p. 229)

These tensions were endemic at Bletchley Park. As noted earlier, GC&CS was itself an organizational attempt to bring together the disparate Sigint work of the services, and yet from the beginning gave rise to complaints from the individual services that their interests were not being met, with the consequence that, within GC&CS, individual sections for the navy (1924), army (1930) and air force (1936) were established (Davies, 2001, pp. 392–3). This ongoing dynamic led to all manner of practical organizational problems, again recognized by De Grey:

> There was never . . . any clear understanding about the staffing of the Service Sections or any uniformity of procedure between them. (HW 14/145, p. 5)

and

> the services were unwilling to mix civil and service men in the same station for administrative reasons. (NA/HW 14/145, p. 8)

Difficulties included the different commissioning, promotion and pay arrangements for the different services; discrepancy between civil and service pay; the 'very low standard of "military" behaviour in a civil institution'; discrepancies in rank between service personnel in BP and those outside; sudden posting away of service personnel (NA/HW 14/145, pp. 5–6). Of Hut 3 De Grey notes that these issues gave rise to 'divided loyalties' (NA/HW 14/145, p. 9); of the Teleprinter Room he says that the 'WAAF resented civil controllers' (NA/HW 14/145, p. 9) and he refers to 'gross inequalities in pay [between civilians and service personnel] . . . monstrous cases where men were doing the same (not similar) work and some getting nearly double the others' (NA/HW 14/145, p. 10).

These issues were not just about personnel: they also arose in relation to the control of resources, for example different listening stations were owned and run by different organizations, and of intelligence product. It also had its counterpart at central government level because, whereas GC&CS ultimately routed through to the Foreign Office, the services routed through to the War Office, Air Ministry and Admiralty. On the other hand, the buildings and fabric, which were crucial as BP grew, were the responsibility of the Ministry of Works and Buildings.

We are skating over much complexity here in the interest of concision (for more detail, see Grey and Sturdy, 2008), but the key point to note is a sense of the complex and chaotic nature of the organization, something noted in the official history of British WW2 intelligence where GC&CS is described as a 'creative anarchy' (Hinsley et al., 1979, pp. 273). This is amply testified by one of the secret official histories of BP written just at the end of the war, that of Frank Birch, who describes the organization as, variously, freakish, disreputable and, administratively speaking, 'a rudderless vessel' (Birch, n.d., p. 177). This is thrown into sharp relief by the incident recalled by one of the first Americans to work at BP, Joseph Eachus, the US Navy's liaison officer who asked for an organizational chart of BP. He was told: '"I don't believe we have one". I didn't pursue this with him, but I was never quite sure whether he meant we don't have a chart or we don't have an organisation' (Obituary, *Daily Telegraph*, London, 19 December 2003).

So the question we can now address is this: if BP was indeed as organizationally chaotic as we have depicted it, how did it manage to produce such successful results? The answer to that, we suggest, is that while BP was *structurally* chaotic it was nevertheless (and perhaps, as we will suggest later, as a result) characterized by a set of cultural practices that at least to some extent overrode this chaos. Thus,

> [In Hut 6] you might readily find a Major working under a Lieutenant or under a civilian, somewhat younger. Whoever was in charge was the person who had been judged to be more effective at doing it. It was meritocracy in spades and without regard to where you came from or whether you were a man or a woman, although I think we had a very large majority of men in the senior positions. (Bill Bundy cited in Smith, 1998, p. 136)

Or, to take another example that seems to disclose a similar picture, this time from an anonymous official internal history,

> Here [Hut 3] over five hundred and fifty individuals of widely differing ages, gifts, and characters, men and women, Service and civilian, British and American, yet formed with all their variety one welded whole; working – often overworking – together, year by year, with unpretentious skill and pertinacity, gaiety and irony, and with less time wasted in intrigue than one could easily have thought possible in this too human world. Not everyone doubtless, overworked. Not everyone was always angelic. This is not a fairy-tale. Not everyone was always content. There were grumbles . . . [b]ut we were 'a happy ship'. (NA/HW 3/119, p. 4)

This sense of a harmonious, happy and quite loosely controlled and informal working culture can be found again and again in accounts of BP. We will indicate shortly that this was not universally so, but there seems no good reason to doubt its veracity both from the many published reminiscences and from contemporary accounts. To take a further example, which again discloses something of the texture of organizational life in at least some parts of BP,

> Ours . . . was an exceptional freedom. Those who did their work well were left, within the inevitable limits, to do it their own way. (By their nature, that freedom was particularly felt in the Research Sections). It was the exact reverse of the HITLER principle of the greatest possible meddling with the greatest possible number. That trust was repaid. And if mistakes were made (as of course they were) by ignorance or negligence, the remedy was found not nearly so much in reprimands, or witch-hunts for the delinquent, as in the mortification decent persons felt at having let things down. (NA/HW 3/119, p. 5, emphasis in original)

Taken together, what these illustrative quotations suggest is that whatever chaos may have existed at the level of formal structures a way of working developed which meant that this did not matter. How could this have been achieved? In the next section we seek to provide some answers to that question.

Explaining the Success of BP's Organization

In this section, we want to advance three explanations of why BP was successful despite – or, as we will later suggest, because of – the 'chaos' or 'freakishness' of its organization. These are, first, high degrees of shared social capital in crucial segments; second, organizational hybridity; and, third, centralization, knowledge-sharing and organizational porosity.

These are to some degree 'cultural' explanations of the BP organization and so it is appropriate to say by way of prelude that clearly a significant factor in play

here was the culture generated by a nation at war at a particular time in history. This meant that people at BP, like those in a myriad of other walks of life, were animated by a sense of giving service at a time of national crisis. This led them to accept conditions which, some 70 years on, would seem very alien. As one Wren recalls: 'Most of us were just the "work horses" and the best way we could help was doing as we were told as quickly and efficiently as possible' (Page, 2002, p. 27). Moreover, the nature of British society (even leaving aside the wartime circumstances) was very different to today. Thus, people more readily accepted demands to perform tasks without question and exhibited a degree of deference to authority than would nowadays be likely (Inglehart, 1999) within a shared moral framework that has arguably declined (Davies, 2006). These wider cultural values informed BP quite as much as any specifically organizational factors.

Yet it will not serve to say that the success of BP can be explained simply in terms of the demands of the wartime context unless, that is, one were to advance the absurd proposition that all wartime organizations were successful. That context was important but the specificities of organizational culture also matter. It is a truism that one of the main influences upon such culture is recruitment. We have seen that BP grew very rapidly over a short period of time and of course this means that the recruitment effort was considerable. The initial drive to recruit 'men of the professor type' (Erskine, 1986) provides the background to the recollections of many BP luminaries. Typical examples, of very many that could be given, include the following:

> In April 1940, about the end of the phoney war, Hugh Last, Professor of Ancient History, asked me to come to his rooms in Brasenose College, Oxford. He explained in a roundabout way that there was important but highly secret war work to be done, and that my studies in ancient languages and Egyptology might make me suitable for it. He advised me to go to a house called Bletchley Park and offer myself. And so on 6 May 1940 I took a train to Bletchley and entered BP . . . (Alec Dakin cited in Hinsley and Stripp, 1993, p. 50)

Or:

> I was recruited for GC&CS by Gordon Welchman, who had supervised me in geometry for Part II of the Cambridge Tripos. (Joan Murray cited in Hinsley and Stripp, 1993, p. 113)

Experiences such as these may strike the modern reader as rather quaint, and certainly incompatible with current employment law. To be recruited to such important work in an almost casual way; to present yourself for work without knowing what it was to be on the advice of a university teacher or colleague seems a far cry from the job descriptions, application forms, interviews, personality tests and so on that are nowadays necessary for even quite mundane jobs. However, the process was by no means casual and it offered some distinct advantages. As De Grey's (1949) report explains, it arose from contingency planning prior to the war, which 'through contacts at the universities earmarked about 60 suitable men . . .

[some of whom] . . . attended a course in peace time . . . [a]ll joined at the outbreak or before' (NA/HW 14/145, p. 4).

Denniston's papers underscore this point. From at least 1937 it was planned to recruit staff 'of the type required' using staff from the First World War codebreaking, now in university positions, as recruiters (DENN 1/4, p. 5). This process continued after the outbreak of war, with Alec Dakin's case being just one example. That it was possible rested in part on the fact that the university system was much smaller than it is now and so it was feasible to identify suitably talented individuals – mathematicians and linguists in the main – relatively easily. The advantages of recruitment through university contacts were both knowledge of these talents but also of the apparent trustworthiness of the people concerned (who would of course have been subject to security vetting as well), a theory which, of course, proved spectacularly unsuccessful in other areas of the intelligence services as the cases of Burgess, Maclean, Blunt and Philby, amongst others, testify! And this surely cut both ways, since presumably those recruited would be unlikely to act upon such oblique approaches unless they came from someone they felt to be trustworthy. It is even possible to see the direct personal networks which at a very micro-level brought people to BP. For example, we have just quoted Alec Dakin's recruitment, but now consider the case of Walter Eytan:

> One day at Oxford, in the summer of 1940, I was asked by someone – I believe it was Alec Dakin – if I would be interested in intelligence work for the war effort, and I said I would. (Eytan cited in Hinsley and Stripp, 1993, p. 57)

Here we can see again the studied casualness of the process but also, more importantly, the very tight, personalised network of, primarily, Oxbridge academics from which it arose.

The consequences of this mode of recruitment within BP was, we suggest, to facilitate the kind of easy and harmonious working that meant that the chaotic formal structure did not impede progress. Commonality of background leads to high degrees of shared social capital or 'characteristic-based' trust (Zucker, 1986) and makes it easier to patch workable solutions 'on the ground' than would otherwise be the case. In effect, recruitment was from a social elite, rooted in Oxbridge in particular with its own pre-existing norms and ways of communicating. Yet this only applied to a small, albeit crucial, segment. The story of BP, as we suggested earlier, is one at variance with the received image of a small coterie of intellectual (and typically upper-class) codebreakers to whom the account of recruitment we have just given most applies. There were many other influences, and the increasing scale of BP from 1941 or 1942 meant that the informal 'old boy network' mode of recruiting became less and less relevant, and a much wider set of social backgrounds resulted. That said, it did set the tone in some of the central parts of the Sigint process, notably the decoding, translation and intelligence activities in Huts 3, 4, 6 and 8, in particular.

It is also worth pointing out that the restricted nature of recruitment impacted upon life outside work at BP. It gave rise to a proliferation of cultural activities including drama, music recitals, chess clubs, language classes, debating groups and so on, of a sort immediately recognizable as the type of 'extra-curricular' activities of the Oxbridge colleges from which the early BP cryptanalysts so often came. And these activities do seem to have had a wider effect upon BP in that, as more staff from more diverse backgrounds came in they joined in with these pre-existing practices and, at least to that extent, potentially shared the kind of social capital and commitments of the earlier and more restricted network.

Our second explanation of how BP functioned successfully despite its structural chaos develops from what we have just said. While it is the case that some parts of BP were characterized by trust, shared norms and meritocracy, in other parts this was not so. On the contrary, many of the routine activities underpinning cryptanalysis, such as the listening activity in the Y-stations, or the transmission of secure intelligence via Typex (the British version of Enigma – they both derived from a pre-war commercial system) were quite different. Here, and elsewhere, the dominant mode of organization was that of traditional factory discipline. Thus in the Typex room,

> Labour was 'directed' [i.e. directed to BP by the Ministry of Labour] and the interest nil. It became necessary to intervene and institute factory methods. This was done chiefly by keeping careful records of output per watch, per machine and per girl. This showed up weaknesses, peak hours etc., and enabled the manager to adjust numbers and skill per watch . . . (HW 14/145, p. 29)

This clearly contrasts sharply with the account of work in Huts 3 and 6 as outlined in the previous section, just as the method of recruitment differs from that of the 'tap on the back' just described; and in other sections at BP something between these two extremes obtained. The analytical point to make then, was that BP exhibited an 'organizational hybridity' in which some parts operated along more or less bureaucratic and hierarchical lines; while others were much more fluid and flat. What can be seen here is entirely consistent with traditional contingency theory in organizational analysis, namely that routine, high-volume, standardized work associates to mechanical, hierarchical, bureaucratic ways of organizing; while indeterminate, rapidly changing and non-standardized work associates to organic, loosely-structured and 'post-bureaucratic' ways of organizing.[3] Holding these together in one operation was only possible because – or, one might say, it created a situation in which – the overall organization was chaotic and fragmented. That is, a uniformly structured organization would find it far more difficult to sustain such radical differences in working methods and culture. We will return to this point in more detail in the discussion.

A third explanation of BP's organizational success is centralization. This has already been remarked upon in one of the few sustained academic treatments of wartime Sigint organization (Ratcliff, 2006). Ratcliff makes the point that the

British Sigint organization, unlike that in Germany, in particular, was concentrated, largely, in one place – in other words, Bletchley Park – and she is unequivocal in ascribing its success to this factor:

> The Allied sigint success rested on the British development of a centralized signals intelligence organization. (Ratcliff, 2006, p. 74)

We have suggested that bringing together many organizations into a single site made for great complexity and chaos, to the extent that to speak of a centralized organization in the singular is somewhat misleading, although it is accurate to say that it was very much more centralized than in Germany.[4] Yet, as Ratcliff rightly points out, it also made possible a centralization of expertise, a kind of 'Sigint university' (or, more accurately, a cryptanalytic university given that, as noted earlier, intercept or Y-operations remained fragmented). This facilitated a considerable amount of knowledge sharing about evolving cryptanalytic technique that would otherwise not have occurred, or been much more difficult. Ratcliff perhaps slightly overstates the extent of this. For example, to say that '[Bletchley] encouraged everyone from intercept personnel to the top cryptanalysts to collaborate and brainstorm for improvements. Initiative was assumed' (Ratcliff, 2006, p. 230) creates a rather excessive picture of the degree of knowledge-sharing. In fact, it was a persistent complaint of interceptors that they were not involved in this way and, specifically, were precluded from showing initiative (e.g. NA/HW 14/19). For that matter, as a translator who worked at BP and who corresponded with us as part of this study put it: 'our boss . . . never lost an opportunity of reminding us we were very small cogs in a very big wheel if anyone showed the slightest initiative'. However, it is certainly true to say that within restricted segments of BP, knowledge-sharing was very much in evidence. One particular example of this, which we can only briefly indicate here, is the way that 'watch tables' within the cryptanalytic huts brought together a wide array of knowledge, disciplines and service lines literally around one table. Again, this may have been administratively messy and yet offered clear organizational advantages.

Moreover, beyond cryptanalysis, the bringing together of Sigint at BP under conditions of wartime mobilization of civilians also brought in people with all kinds of knowledge and expertise from the outside, which proved critical. We can call this 'organizational porosity' in the sense of an interchange with the outside world: examples include the extensive use of managers recruited from John Lewis department stores and from banks that contributed to the development of administrative machinery and, on the technical side, GPO staff with expertise in electronic engineering. Perhaps most significantly, the importation of indexing techniques from commercial settings and from libraries contributed to the development of indexes at BP (Black and Brunt, 1999; Brunt, 2004). The reason this is crucial is that the capacity to create usable intelligence did not depend simply upon successful decryption, but on bringing together and making sense of the patchwork of information disclosed by individual messages into a useable product. So in all

of these ways, a growing organization, sucking in diverse expertise and bringing it together, while creating an immense complexity of organization nevertheless facilitated a kind of learning and of knowing which contributed to success. In this, and other respects, BP bears some resemblance to what would nowadays be called knowledge-intensive organizations, something we explore in detail elsewhere (Grey and Sturdy, 2009).

Discussion

One of the staples of organizational analysis since at least the 1930s has been the recognition that there is often and perhaps even always a divergence between the 'formal' organization of structures, rules and procedures and the 'informal' organization embodying, loosely, what actually happens (e.g. Blau, 1955; Gouldner, 1954). These two aspects are not unrelated. On the contrary, they interact and co-produce each other. In a sense, organization itself consists of continual interplay between the formal and informal. The consequences of that interplay are enormously varied. Often, the informal organization undercuts or subverts formal organizational purposes and intentions. But, as we suggest is the case with BP, it can also operate so as to solve, or at least resolve, the apparent limitations of a formal organization with tangled command structure and heterogeneous employment practices. An obvious example would be that whereas relations between civilians and military personnel were a source of confusion and indeed dispute at the formal level of structure, they were, as our earlier quote from Bill Bundy shows (and many similar accounts confirm), dealt with unproblematically and happily at the 'coal face' of the watch tables.

This is what we called in the introduction to this article, the 'weak' version of our argument. It is saying that despite the chaos or anarchy of BP organization identified both at the time and by later writers, a set of workable arrangements managed to emerge. The notion of 'workable arrangement' is again one of the classic staples of organizational analysis (Dalton, 1959; Gouldner, 1955) and refers to the idea that management, in particular, and organizing in general, consists of an ongoing, social process of negotiation in which accommodations are reached and solutions to problems patched together. On this analysis, the formal organization and structure are, at best, fleeting crystallizations of what is in reality a fluid and emergent process and so the deficiencies of the former need not 'matter' if the arrangements constructed by the latter are adequate to the task at hand.

The 'strong' version of the argument is that these workable arrangements were able to emerge precisely *because* of the structural chaos. In other words, rather than the chaos not 'mattering', it actually supported or allowed workable arrangements to emerge. Why might this be so?

Had BP been a unified organization with a clear line of command – in the manner of a traditional civil service or military organization – then it seems extremely unlikely that the three attributes of success we outlined in the last section could

have occurred. Such organizations are necessarily characterized by a degree of standardization and formalization. These, indeed, are two of the defining attributes of bureaucracy (Pugh and Hickson, 1976), which, in this context, we can identify as the template for, so to speak, a 'non-chaotic' organization. One of the causes and consequences of unified and standardized organizations is a formalization of recruitment, typically through an elaborate barrage of tests, interviews and so on. This has many virtues, including meritocracy of appointment (Du Gay, 2000), but is clearly at odds with the pattern of early recruitment at BP. It is true that formalized recruiting can often result in high degrees of homosociality (Kanter, 1977) – the traditional civil service being an example – but even so is unlikely to result in the extremely personalized, dense social interconnectedness of the cryptanalytic segments of BP. These, as we have seen, did not mean simply recruitment from a common social strata ('homosociality'), but from a directly, in some cases intimately, connected set of individuals – something more akin to 'community' or, at least, 'networked reputation' (Gluckler and Armbrüster, 2003).

It is instructive to make a comparison with US Sigint arrangements (prior to Pearl Harbour). Here, too, the problem of inter-service demarcations was present, but the solution was attempted in a highly formalized way, specifically that decryption of Purple (the Japanese cipher) was done on alternate days by Army and naval cryptanalysts (Andrew, 1995, p. 106). This was an administratively 'tidy' solution – and a classic piece of compartmentalization – and yet, as it proved, an impractical and indeed disastrous one. The administratively 'messy' British solution of patching service rivalries through personal and pragmatic ways of working together, and leaving the formalities to one side, proved much more successful. Our point is that the 'organizational space' for such a patched up solution could only exist because of lack of structural clarity.

Turning now to the second factor we identified, the possibility of organizational hybridity is much more unlikely to occur within a tightly specified and formalized set of organizational arrangements. It is by definition the case that such arrangements tend towards a common template. Had BP been a single organization rather than the complex node of organizations we identified, then it would be much more difficult for different parts of the node to be organized along radically different lines. Indeed, classic contingency theories of organization predict that complex organizations will be characterized by mixtures of this sort, although some such theories (Lawrence and Lorsch, 1967) tend to assume that this will be a result of a rationally planned and overseen or 'integrated' process, rather than the more ad hoc way that it occurred at BP, which is more akin to Burns and Stalker's (1961) account of innovative firms. As with the previous point, finding 'local' solutions, in the sense of local to particular work groups and functions, was only possible *because* of the organizational mess that precluded standardized ways of working. This clearly links with one of the aspects of the third factor we identified, organizational porosity. The bringing together of people from a wide range of experiences and adapting those experiences into the new setting of BP would be much less

likely to occur in a more standardized organization simply because such organizations typically – almost by definition – have 'their own ways of doing things' and are relatively resistant to outsiders. Indeed, such organizations will typically be relatively segregated from outside influences; training, socializing and developing staff in-house. The rapid growth of BP from a tiny core meant that this could not happen and that instead, cross-fertilization from a variety of organizational practices drawn from disparate sites impacted upon BP. This is perhaps, especially remarkable given that the secrecy of the work of BP closed it off from the outside in many other respects.

On the remaining aspect of the third factor, centralization, the argument is slightly different. It is not so much the case that the organizational messiness allowed centralization so much as that centralization, with all the benefits that brought, was part of the reason for organizational messiness. The notion of a 'Sigint university', and the importation of aspects of Oxbridge culture, is instructive here. Oxbridge, in particular, but other universities to some extent, is often characterized by organizational messiness and lack of clear command and control structures. In the Oxbridge case, specifically, the complex and historically accreted web of relations between multiple colleges and the university is one which itself defies easy characterization (Leedham-Green, 1996). Yet it is often credited with engendering remarkable intellectual creativity and, in particular, bringing together different disciplines, ideas and problematics. This would be the precise analogue of the kinds of knowledge-sharing that centralization permitted at BP. The point again, is that the ability of BP, like universities, to do certain things well seems to be related to haphazard and loosely specified organizational structures. It is no coincidence that highly innovative forms in the high-tech private sector – Google is a well-known example – often emerge from, and in key respects consciously emulate, the rather loosely specified structures of universities (New York Times, 2006).

Conclusion

That BP was successful is not in doubt. The breaking of the Enigma cipher, in particular, constituted not only an extraordinary achievement in its own right, but one which has been authoritatively claimed to have shortened the time it took for the Allies to win the war by some two to three years (Hinsley, 1993b). The reasons for this success are of course many and varied, and it has not been our intention to explore all of these. What we have explored is the question of how the organization of BP impacted upon its success.

Now of course, strictly speaking, this must ultimately be a speculative argument. There is, as ever in history, no counterfactual here. Perhaps if BP had been organized differently it would have been even more successful, and we can never prove otherwise. Perhaps its organization was irrelevant – yet that seems an implausible claim if it means saying that BP's success is to be understood solely as a cryptanalytic achievement since it is obvious from what we have said that that achieve-

ment required an organizational infrastructure. At an absolute bare minimum, the creation of an effective network for delivering intercepts to BP in timely fashion was a precondition for cryptanalysis to occur, and of course a much greater infrastructure was required than that. Moreover, the work of Ratcliff (2006), while slightly different in interpretation to ours, provides good comparative grounds for claiming that the organization of BP when compared to that of the German Sigint effort, was a relevant, even decisive, factor.

If it is granted that the organization of BP was in some way relevant to its success, then we can ask: what was its relevance? All commentators, both at the time and since, agree that BP was organized in an apparently bizarre, freakish, anarchic and chaotic way. We have sought briefly to explain why that was so, but more importantly to explain why it was successful despite, or as we have argued, because of the chaos. That again is ultimately a speculative argument and we can do no more than offer it up as plausible and leave readers to judge whether it is convincing.

If it is convincing, then it has a wider import than simply understanding BP. We can envisage that import as a series of concentric circles. Herman's (1996) analysis of intelligence organizations, focusing largely on Sigint, identifies an endemic tension in such organizations between the need for knowledge-sharing and organic-style organization and the political and security-dictated need for compartmentalization and hierarchical control. He gives BP as an example of precisely the most efficacious blend of the two (Herman, 1996, pp. 331–3). Moving to the next ring of the concentric circle, Herman's analysis is picked up and developed by Davies (2004) in his study of MI6 where he argues that not just intelligence organizations, but, more generally, those governmental machineries in areas of public service where knowledge, information and rapid change are crucial must perforce be characterized by both mechanistic and organic forms of rationalization (Davies, 2004, p. 326).

This in turn pries open the wider issue of the place of bureaucracy within the delivery of public services of all sorts, for the dominant discourse of public administration seems firmly of the view that all areas of service delivery need to be purged of their mechanistic features. The achievement of the contingency theorists – for all that their work now seems dated and deterministic – was to displace what was at one time the mainstream view in organization and administrative theory that bureaucracy was the primary way of delivering efficient government. That view (highly dependent on a very partial, Parsonian, reading of the work of Max Weber) came under sustained attack from the 1950s onwards by scholars identifying the many contingencies of environment, technology, size, strategy and so on which impinged upon 'successful' organizational forms. Now, when the new orthodoxy – that bureaucratic or mechanical organization is necessarily undesirable and post-bureaucratic or organic organization is necessarily advantageous – appears well entrenched, it is useful to recall that there is no 'one best way' of organizing. Indeed, the more radical implication of the BP story may be to

undermine the value placed upon models of organizing – as opposed to emergent 'ad hocery', the application of common sense and an acceptance of the role of serendipity – at all.

By the same token, in giving the explanation of BP's success that we have provided here, we are not offering it as a prescription or template for good organization in the way that the oxymoron of managed chaos is sometimes suggested by 'management gurus' (Peters, 1989; Semler, 2004). The case of BP is a highly specific one, both in terms of its time and the nature of its operations. Many of the organizational solutions it found were indeed serendipitous, and some would not be practicable in modern settings. Yet it may be more than an historical curio. At a time when management techniques continue to be formulaic and standardized – mission statements that are scarcely distinguishable from each other, mantras of singular best practices which invite homogenization – there may be some lessons, allegorical rather than literal, from the chaos that worked in a scruffy collection of wooden huts seventy years ago.

Notes

1. HW numbers refer to the NA catalogue identifiers. DENN numbers refer to the Alistair Denniston papers in the Archive of Churchill College, Cambridge.
2. We will use the term 'head' throughout because, confusingly, the head of BP was actually called the 'Deputy Director' until 1944, the Director being the head of SIS, referred to at the time not by name but as 'C' (Initally 'C' was Admiral Hugh Sinclair and subsequently Colonel Stewart Menzies). We similarly use strictly inaccurate, but helpfully clear terms to refer to other senior figures at BP. The 'head' of BP was Commander Alistair Denniston until 1942 and subsequently Commander (later Sir) Edmund Travis. The pivotal re-organization of 1942 is examined elsewhere (Grey and Sturdy, 2008).
3. It is beyond the scope of the present article, but one might argue that these largely Oxbridge derived and 'collegial' ways of working at BP, while 'organic' might better be described as 'pre-bureaucratic' rather than 'post-bureaucratic', deriving as they did from an organizational form – the mediaeval university – which pre-dated rationalized modernity and carried at least some of those features into the 20th century. Nevertheless, since current formulations of organicism invariably reference post-bureaucracy we stick with that term for ease of exposition.
4. It will be clear that the difference between our assessment and Ratcliff's is one of relative focus. Her focus is comparative centralisation of British and German Sigint arrangements; our focus is a comparison of British Sigint with a 'standard' commercial or governmental organization.

Acknowledgment

The financial support of the Nuffield Foundation Social Science Small Grants Scheme, which funded the data collection phase of this project, is gratefully acknowledged.

References

Andrew, C. (1995) *For the President's Eyes Only: Secret Intelligence and the American Presidency from Washington to Bush*. London: Harper Collins.

Birch, F. (n.d., postwar) *A History of British SigInt*. Vols. I, II. GC&CS internal document, Bletchley Park Trust Archive.

Black, A. and Brunt, R. (1999) 'Information Management in Businesses, Libraries and British Military Intelligence: Towards a History of Information Management', *The Journal of Documentation*, 55(4): pp. 361–74.

Blau, P. (1955) *The Dynamics of Bureaucracy*. Chicago, IL: Chicago University Press.

Brown, C. (2005) *1966 and All That*. London: Hodder.

Brunt, R. (2004) 'Indexes at the Government Code and Cypher School, Bletchley Park, 1940–1945', URL http://www.chemheritage.org/pubs/asist2002/24-brunt.pdf

Budiansky, S. (2000) *Battle of Wits. The Complete Story of Codebreaking in World War II*. London: Viking.

Burns, T. and Stalker, G. (1961) *The Management of Innovation*. London: Tavistock.

Calvocoressi, P. (2001) *Top Secret Ultra*. Kidderminster: Baldwin.

Cameron, D. (2009) 'It's Not Enough for Labour to Lose this Election', *The Spectator* (19 March): p. 16.

Copeland, B.J. (2001) 'Colossus and the Dawning of the Computer Age', in M. Smith and R. Erskine (eds) *Action this Day*. London: Bantam.

Dalton, M. (1959) *Men Who Manage*. New York: Wiley.

Davies, C. (2006) *The Strange Death of Moral Britain*. Somerset, NJ: Transaction Publishers.

Davies, P. (2001) 'From Amateurs to Professionals: GC&CS and Institution-Building in Sigint', in M. Smith and R. Erskine (eds) *Action this Day*. London: Bantam.

Davies, P. (2004) *MI6 and the Machinery of Spying*. Abingdon: Frank Cass.

Du Gay, P. (2000) *In Praise of Bureaucracy*. London: SAGE.

Erskine, R. (1986) 'GC&CS Mobilises "Men of the Professor Type"', *Cryptologia*, 10(1): pp. 50–9.

Evans, D. (2003) 'BP: The Development and Historical Function of the Fabric', Bletchley Park Trust (mimeo).

Ferris, J. (2005) *Intelligence and Strategy: Selected Essays*. London: Routledge.

Gluckler, J. and Armbrüster, T. (2003) 'Bridging Uncertainty in Management Consulting – The Mechanisms of Trust and Networked Reputation', *Organization Studies*, 24(2): pp. 269–97.

Goldstine, H. (1993) *The Computer from Pascal to von Neumann*. Princeton, NJ: Princeton University Press.

Gouldner, A.W. (1954) *Patterns of Industrial Bureaucracy*. New York: Free Press.

Gouldner, A.W. (1955) *Wildcat Strike*. New York: Routledge & Kegan Paul.

Grey, C. and Sturdy, A. (2008) 'The 1942 Re-organization of GC&CS', *Cryptologia*, 32(4): pp. 311–33.

Grey, C. and Sturdy, A. (2009) 'Historicising Knowledge-Intensive Organizations: The Case of Bletchley Park', *Management and Organizational History*, 4(2): pp. 131–50.

Harris, R. (1995) *Enigma*. London: Hutchinson

Heckscher, C. (1994) 'Defining the Post-Bureaucratic Type', in C. Heckscher and A. Donnellon (eds) *The Post-Bureaucratic Organization*. Thousand Oaks, CA: SAGE.

Herman, M. (1996) *Intelligence Power in War and Peace*. Cambridge: Cambridge University Press.
Hill, M. (2004) *Bletchley Park People*. Stroud: Sutton Publishing.
Hinsley, H. (1993a) *British Intelligence in the Second World War (Abridged)*. London HMSO.
Hinsley, H. (1993b) 'Introduction: The Influence of Ultra in the Second World War', in H. Hinsley and A. Stripp (eds) *Codebreakers*. Oxford: Oxford University Press.
Hinsley, H. and Stripp, A. (eds) (1993) *Codebreakers*. Oxford: Oxford University Press.
Hinsley, H., Thomas, E., Ransom, C. and Knight, R. (1979) *British Intelligence in the Second World War (Volume 1)*. London: HMSO.
Hodges, A. (1992) *Alan Turing: The Enigma*. London: Random House.
Inglehart, R. (1999) 'Trust, Well-being and Democracy', in F. Warren (ed.) *Democracy and Trust*. Cambridge: Cambridge University Press.
Kahn, D. (1996) *The Codebreakers (Revised Edition)*. New York: Scribner.
Kanter, R.M. (1977) *Men and Women of the Corporation*. New York: Basic Books.
Kernaghan, K. (2000) 'The Post-bureaucratic Organization and Public Service', *International Review of Administrative Science*, 66(1): pp. 91–104.
Lawrence, P. and Lorsch, J. (1967) *Organization and Environment*. Cambridge, MA: Harvard University Press.
Leedham-Green, E. (1996) *A Concise History of the University of Cambridge*. Cambridge: Cambridge University Press.
Morris, J. and Farrell, C. (2007) 'The 'Post-Bureaucratic' Public Organization. New Organizational Forms and HRM in ten UK Public Sector Organizations', *International Journal of Human Resource Management*, 18(9): 1575–88.
Newman, J. (2001) *Modernizing Governance: New Labour, Policy and Society*. London: SAGE.
New York Times (2006) 'Can Google Come Out to Play?', (31 December).
Page, G. (ed.) (2002). *We Kept the Secret. Now it Can be Told – Some Memories of Pembroke V Wrens*. Wymondham: G R Reeve.
Page, G. (ed.) (2003) *They Listened in Secret. More Memories of the Wrens*. Wymondham: G R Reeve.
Peters, T. (1989) *Thriving on Chaos: Handbook for a Management Revolution*. New York: Harper Business.
Pugh, D. and Hickson, D. (1976) *Organisation Structure in its Context: The Aston Programme*. London: Saxon House.
Ratcliff, R. (2006) *Delusions of Intelligence. Enigma, Ultra and the End of Secure Ciphers*. Cambridge: Cambridge University Press.
Semler, R. (2004) *The Seven Day Weekend. Changing the Way Work Works*. New York: Penguin Portfolio.
Smith, M. (1998) *Station X*. Basingstoke: Macmillan.
Summerfield, P. and Peniston-Bird, C. (2006) *Contesting Home Defence: Men, Women and the Home Guard in Britain in the Second World War*. Manchester: Manchester University Press.
Welchman, G. (1981) *The Hut Six Story*. London: Penguin.
Winterbotham, F. (1974) *The Ultra Secret*. London: Weidenfield & Nicholson.
Zucker, L.G. (1986) 'Production of Trust: Institutional Sources of Economic Structure,

1840–1920', in B.M. Staw and L.L. Cummings (eds) *Research in Organizational Behavior*. Greenwich, CT: JAI Press.

Christopher Grey is Professor of Organizational Behaviour at Warwick Business School. Prior to that he was Professor of Organizational Behaviour at the Judge Business School, University of Cambridge, where he is now a Visiting Fellow. He has wide ranging research interests in the sociology of organizations and management, with a particular focus on professions and knowledge, and more generally in Critical Management Studies. The second edition of his popular book, *A Very Short, Fairly Interesting and Reasonably Cheap Book about Studying Organizations*, was published by SAGE in 2009.

Andrew Sturdy is Professor of Organisational Behaviour and Associate Dean at Warwick Business School, UK. He has a longstanding interest in the production and use of management ideas. His research has explored this in various contexts including training, business school education and, in particular, management consultancy. Most recently, he led a 'fly-on-the-wall' study of consultancy projects, from which a book (with Handley, Clark and Fincham), *Management consultancy: Boundaries and Knowledge in Action*, was published by Oxford University Press in 2009.